

## Mission Hill Parcel 25 <br> Project Notification Form

## Submitted Pursuant to Article 80B of the Boston Zoning Code

## Submitted by:

Mission Hill Parcel 25 LLC
C/o Mission Hill Neighborhood Housing Services, Inc.
One Brigham Circle / M Level
1620 Tremont Street
Mission Hill, MA 02120

## Submitted to:

Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

## Prepared by:

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Newton, MA 02461

## In Association With:

Goody Clancy
Howard/Stein-Hudson, Inc.
Munkenbeck Consulting
Rowan Williams Davies \& Irwin Inc.
Tech Environmental. Inc.
WilmerHale LLP
Woodward \& Curran
Kyle Zick Landscape Architecture
June 23, 2014


CONSULIING LLC


June 23, 2014
Brian Golden, Acting Director
Boston Redevelopment Authority
Boston City Hall, 9th Floor
Boston, MA 02201
Attn: Tyler Norod, Project Manager
Re: Mission Hill Parcel 25 Project
Project Notification Form (PNF)
Dear Acting Director Golden:
Mission Hill Parcel 25 LLC (the "Proponent") is submitting this Project Notification Form ("PNF") for the Parcel 25 Project ("Proposed Project") in accordance with the Article 80B-1 Large Project Review requirements of the Boston Zoning Code ("Code") to develop the property located on a former MBTA owned parcel bounded by Tremont, Gurney, and Station Streets, an MBTA Pumping Station and close to the Southwest Corridor/MBTA tracks in the Mission Hill neighborhood and includes an approximately 5,500 square foot parcel on the northeast corner of Gurney Street. (the "Proposed Site").

In accordance with Boston Redevelopment Authority ("BRA") requirements, please find attached 10 copies of the PNF plus a CD disk for placing the filing on the BRA website for public review

The Proposed Project involves development for a mixed-use, residential, retail and commercial development of approximately $305,750 \mathrm{gsf}$, to be developed in three phases, which will include at full build-out: $98,000 \mathrm{gsf}$ of residential space ( 88 apartment units), $10,000 \mathrm{gsf}$ of retail, $1,250 \mathrm{gsf}$ of community space, and up to 196,500 gsf of office. Additionally, the full build-out of the Project will contain up to 201 surface and below-grade structured parking spaces. Of this overall build out, the Phase I development program is composed of 88,250 gsf and includes 40 residential apartment units at approximately 42,000 square feet, $10,000 \mathrm{gsf}$ of retail space, 35,000 gsf of office space, $1,250 \mathrm{gsf}$ of community space and 56 surface parking spaces.

The Proposed Project will exceed the 50,000 square foot total build-out size requirement for a project in a Boston neighborhood and therefore requires the preparation of filings) under the Large Project Review regulations, pursuant to Article 80 of the Boston Zoning Code. A Letter of Intent to File a Project Notification Form was filed with the Boston Redevelopment Authority for the Proposed Project on December 23, 2013. (attached as Appendix A to the filing).

As the Proposed Site is within a location that permits the creation of a Planned Development Area ("PDA") in accordance with Article 59 of the Boston Zoning Code, a PDA Plan has been created for the Project Site and is being submitted to the BRA for review. The public notice for the PNF appears in the June 23, 2014 Boston Herald.

The Proposed Project for these long-vacant and blighted Mission Hill parcels is based on the community's vision that grew out of the multi-year comprehensive participatory planning process for the site and surrounds, organized and led by Mission Hill Neighborhood Housing Services and involving hundreds of neighborhood residents, businesses, and area stakeholders, institutional neighbors and elected officials.

On behalf of the entire project team, we would like to thank you and the BRA staff assigned to the Parcel 25 Project, particularly the BRA Project Manager, Tyler Norod, for the invaluable assistance provided allowing the Proponent to achieve this comprehensive PNF filing.

We believe that the Proposed Project will be a significant addition to Mission Hill, the Tremont Street mixed-use neighborhood corridor, and the City of Boston as a whole.

Sincerely,

## MISSION HILL PARCEL 25 LLD



Patricia Flaherty, Senior Project Manager
Attachment: Mission Hill Parcel 25 Project Notification Form (10 Copies plus CD)
Cc: Heather Campisano, BRA
Enrico Lopez, BRA James Hoffman, MHNHS
Mitchell Fischman, Mitchell L. Fischman Consulting, LLC

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### 1.0 EXECUTIVE Summary

### 1.1 Introduction

Mission Hill Parcel 25 LLC (the "Proponent") is submitting this Project Notification Form ("PNF") for the Parcel 25 Project ("Proposed Project") in accordance with the Article 80B-1 Large Project Review requirements of the Boston Zoning Code ("Code"). The Proposed Project involves development for a mixed-use, residential, retail and commercial development of approximately $305,750 \mathrm{gsf}$, to be developed in three phases, which will include at full build-out: $98,000 \mathrm{gsf}$ of residential space ( 88 apartment units), $10,000 \mathrm{gsf}$ of retail, $1,250 \mathrm{gsf}$ of community space, and up to $196,500 \mathrm{gsf}$ of office. Additionally the full build-out of the Project will contain up to 201 surface and below-grade structured parking spaces. Of this overall build out, the Phase I development program is composed of $88,250 \mathrm{gsf}$ and includes 40 residential apartment units at approximately 42,000 square feet, $10,000 \mathrm{gsf}$ of retail space, $35,000 \mathrm{gsf}$ of office space, $1,250 \mathrm{gsf}$ of community space and 56 surface parking spaces.

The Proposed Project will exceed the 50,000 square foot total build-out size requirement for a project in a Boston neighborhood and therefore will require preparation of filing(s) under the Large Project Review regulations, pursuant to Article 80 of the Boston Zoning Code. A Letter of Intent to File a Project Notification Form was filed with the Boston Redevelopment Authority for the proposed project on December 23, 2013 (See Appendix A).

As the site is within an area that permits the creation of a Planned Development Area ("PDA") in accordance with Article 59 of the Boston Zoning Code, a PDA Plan will be created for the Project Site and is being submitted to the BRA.

The Proposed Project for these long-vacant and blighted parcels is based on the Mission Hill community's vision that grew out of the multi-year comprehensive participatory planning process for the site and surrounds, organized and led by Mission Hill Neighborhood Housing Services and involving hundreds of neighborhood residents, businesses, and area stakeholders, institutional neighbors and elected officials. The program will reestablish Roxbury Crossing as lively transit-oriented site where people once again live, work, shop and recreate.

The Site is located on a former MBTA owned parcel bounded by Tremont, Gurney, and Station Streets, a MBTA Pumping Station and MBTA tracks/SW Corridor in the Mission Hill neighborhood and includes an approximately 5,500 square foot parcel on the northeast corner of Gurney Street ("Proposed Site"). Please see Figures 1-1 and 1-2.

The Site is also located across Gurney Street from a residential complex that includes elderly housing which is currently being constructed by an affiliate of the Mission Hill Neighborhood Housing Services.


Figure 1-1.
Parcel 25, Project Locus


Figure 1-2.
USGS Map

### 1.2 Proposed Project

### 1.2.1 Project Site and Surroundings

The Project Site, generally a commercialized area, is also in the midst of a very active transportation node. The Roxbury Crossing Orange Line is just to the south of the Site and the Southwest Corridor across the tracks from the project site runs parallel to its eastern boundary. Nearby uses include the Mission Main HOPE VI residential development, as well as ground level commercial and retail uses along Tremont Street.

As discussed, the Proposed Project will implement the Mission Hill community's vision for this vacant and blighted area and will be the catalyst in the rebirth of Roxbury Crossing as a thriving mixed-use center and entrance to the Mission Hill community.

### 1.2.2 Detailed Project Description

The overall Parcel 25 Proposed Project, the subject of this PNF, will be completed in three phases over an anticipated span of approximately 5 years. The Phase I Project consists of approximately $88,250 \mathrm{gsf}$ and includes 40 residential apartment units, $10,000 \mathrm{gsf}$ of retail space, $35,000 \mathrm{gsf}$ of office space, and $1,250 \mathrm{gsf}$ of community space, with 56 surface parking spaces. The Phase 1 Project is made up of two buildings. Building 1A is a 5 story, mixed use building containing retail uses along Tremont Street, the residential entrance along Gurney Street, and entrance to the first and second floor office at the pedestrian plaza across from the Roxbury Crossing MBTA Station. The entrance to the community room is also located on this plaza which connects the intersection of Gurney Street and the Gurney Street Extension to the Tremont Street entrances to the T station and busses. Building 1 B is to be an iconic two-story building symbolizing the entrance to the Mission Hill community and including retail on the first floor with office space on the second anticipated to be nonprofit office and youth training space.

The balance of the Proposed Project will be developed in Phases II and III. At this point in time it is expected that these will be two separate phases of development with Phase II continuing residential development along Gurney Street to Station Street and Phase III the commercial building along the tracks. It is conceivable that Phase III could become before Phase II, depending upon funding and identification of user. It is very possible that Phases II and III could be built at the same time. The three phases of development will total approximately 305,750 gsf which will include at full build-out: approximately $98,000 \mathrm{gsf}$ ( 88 apartment units), 10,000 gsf of retail, $1,250 \mathrm{gsf}$ of community space, and $196,500 \mathrm{gsf}$ of office. At this Transit Oriented Development (TOD), there will be up to 201 below grade and surface parking spaces.

The Site circulation plan is designed to create a safe and pleasant entry to the Proposed Project for pedestrians from Gurney Street or Tremont Street. Automobiles will enter the site from Station Street. Service vehicle access will also be provided from Station Street. On-site parking will include the 56 surface parking spaces in Phase I, 35 spaces in the temporary surface lot off

Station Street and 16.permanent surface space on Gurney Street at Parcel 25B. At the Proposed Project's full build out, there will be a total of 201 parking spaces.

Table 1-1. Approximate Project Dimensions of Parcel 25 Project

| Lot Area: | 82,203 sf (1.9 Acres) |
| :---: | :---: |
| Gross Building Footprint Area: | Phase 1: $22,687 \mathrm{sf}$ <br> Full Build Out: $58,384 \mathrm{sf}$ |
| Gross Square Feet: | Phase 1: 88,250 gsf <br> Full Build Out: $305,750 \mathrm{gsf}$ |
| FAR: | Phase 1:1.07 <br> Full Build Out: 3.75 |
| Floors: | Phase 1:5 <br> Full Build Out: 11 (including <br> rooftop mechanicals) |
| Height: | Up to 160 feet |

### 1.3 Summary of Project Impacts and Mitigation

### 1.3.1 Urban Design

The Proponent developed the massing, mix of uses, and design from input from Mission Hill residents, business owners, community organizations, youth, and institutional neighbors during an extensive community planning and visioning process.

The Parcel 25 Phase I project consists of two separate structures - a requirement created by the need to avoid building over the Stony Brook Conduit, which cuts diagonally across the site. The larger of these structures will consist of a first floor base incorporating retail on the Tremont Street side, residential lobby on the Gurney Street side, and community and office space accessible from the new pedestrian plaza. Office space occupies the second floor, while floors 3, 4 , and 5 consist of 40 residential units in a mix of 1,2 , and 3 bedrooms. The smaller structure includes retail space on the first floor and office space above anticipated to be used for local nonprofit offices and training space.

The project's edges are largely kept close to the sidewalk, reconstructing the street walls on Gurney and Tremont Streets. Pedestrian access will be maintained across the site over the route of the Stony Brook conduit. This will facilitate neighborhood access to the Roxbury Crossing MBTA station.

The Full Build project will respond to a range of size and scale around the Project Site. The 4 and 5 story structures of Phase I and II, along with the Senior Housing project already underway across the street (at four stories as well) respect the low-rise context of the Mission Hill neighborhood and re-establish Gurney as a comfortably scaled residential street.

The low-rise structures mediate between that scale and the larger size of the Phase III office building. At 160 feet high, located next to the MBTA tracks, the office building is part of existing and proposed large scale development along the MBTA Orange Line, located and built to a density to take advantage of the proximity to high quality transit service.

### 1.3.2 Sustainable Design

The Proponent and the Project design team are committed to an integrated design approach and are using the LEED BD+C new construction rating system, in conjunction with the LEED ND: Plan system to be LEED Silver certifiable as presented in Figure 3.5-30 in Section 3.0. This rating will meet or likely exceed Boston's Green Building standard. Significant green features of the Proposed Project include extensive alternative transportation initiatives, increased water and energy efficiency, recycled content and salvaged building materials, improved indoor air quality, and innovative design and operations strategies.

### 1.3.3 Pedestrian Wind Assessment

Rowan Williams Davies \& Irwin Inc. (RWDI) was retained by the Proponent to assess the potential wind conditions for Parcel 25 Phase I and Full Build (with Phases II and III) condition. The objective of this assessment was to provide a qualitative evaluation of wind comfort on and around the proposed development and recommend mitigation measures, if necessary. The Assessment's conclusion is that due to the limited height of Phases I and II structures, these buildings will not cause any adverse wind impact on the surrounding area. The resultant wind conditions on and around the Project site are predicted to meet the BRA effective gust criterion throughout the year. The full Parcel 25 Pedestrian Wind Assessment is contained in Appendix B.

### 1.3.4 Shadow Impact Analysis

Goody Clancy, the Project's architects, prepared a shadow study to assess the potential shadow impacts of the Project on the surrounding area (see Section 4.2).

Even with the proposed height of Phase III extending to 160 feet, the Proposed Project's shadow impacts are not extensive. New shadow is generally limited to the streets surrounding the Site. Although late afternoon and evening shadows will extend in an easterly/northeasterly direction toward the southeast corridor and Columbus Avenue, most of these lots and areas are currently impacted by current shadow patterns from existing buildings. Overall, the Proposed Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surroundings.

### 1.3.5 Daylight Analysis

Because the existing site is vacant, the full build out would likely create some increase in daylight obstruction when compared to the existing conditions at the site. Parcel 25 Phase I has been
designed to be of a similar height and massing as those buildings along Tremont and Gurney Streets, and will reach no more than a maximum height of 60 feet. Phase II is not expected to exceed 60 feet, and Phase III will not exceed 160 feet. All of these heights are at or below the height of 160 feet, the zoning height allowed following Planned Development Area designation which can be utilized in this portion of Mission Hill's Neighborhood Zoning District.

### 1.3.6 Solar Glare Analysis

The Parcel 25 Phase I Project does not include the use of reflective glass or other reflective materials on the building facades that would result in adverse impacts from reflected solar glare. Should such materials be used in later project phases at full build out, the Proponent will provide any needed evaluations to the BRA as a part of design review for these later phases.

### 1.3.7 Air Quality Analysis

Tech Environmental, Inc., the Project's air quality consultant, conducted analyses to evaluate the existing air quality in the Project area, predict the worst-case air quality impacts from the Project's parking garages, and evaluate the potential impacts of Project-generated traffic on the air quality at the most congested local intersections (See Section 4.4).

Recent representative air quality measurements from the Massachusetts Department of Environmental Protection (DEP) monitors reveal that the existing air quality in the Project area is in compliance with Massachusetts and National Ambient Air Quality Standards (NAAQS) for all of the criteria air pollutants.

The worst-case air quality impacts from the Project's parking garages will not have an adverse impact on air quality. The maximum one-hour and eight-hour ambient CO impacts from the parking garages, at all locations around the Project site, including background CO concentrations, are predicted to be safely in compliance with the NAAQS for CO.

A microscale CO air quality analysis was conducted for the three intersections in the Project area that meet the Boston Redevelopment Authority (BRA)/DEP selection criteria. Three cases were analyzed: 2013 Existing, 2018 No-Build, and 2018 Build. The microscale air quality analysis indicates that the worst-case air quality impacts from motor vehicles operating at the two analyzed intersections will improve in 2018, for both the Build and No-Build cases, compared to the 2013 Existing case. The analysis shows that with mitigation the worst-case CO impacts for the 2008 Build case are lower than those predicted for the 2018 No-Build case and the worst-case impacts for all three cases are safely in compliance with the NAAQS for CO at all modeled receptors.

### 1.3.8 Noise Analysis

Tech Environmental, Inc., the Project's noise consultant, conducted a noise study to determine whether the operation of the proposed Project will comply with the Massachusetts DEP Noise Policy and City of Boston Noise Regulations (See Section 4.5).

This acoustical analysis involved five steps: (1) establishment of pre-construction ambient sound levels in the vicinity of the Site; (2) identification of potential major noise sources; (3) development of noise source terms based on manufacturer specifications (where available) and similar project designs; (4) conservative predictions of maximum sound level impacts at sensitive locations using industry standard acoustic methodology; and (5) the incorporation of mitigation measures to ensure compliance with applicable City of Boston noise regulations, ordinances and guidelines and with the DEP Noise Policy.

Nighttime ambient baseline sound level ( $\mathrm{L}_{90}$ ) monitoring was conducted at two locations deemed to be representative of the nearby residential areas, during the time period when human activity is at a minimum and any future noise would be most noticeable. The lowest nighttime $\mathrm{L}_{90}$ measured in the Project area was 46 dBA .

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

- (3) Cooling Towers
- (3) Chillers
- (8) Rooftop air handling units
- (2) EHRUs
- $1,000 \mathrm{~kW}$ rooftop emergency generator


## Noise Mitigation

The Proponent is committed to implementing the following sound level mitigation measures for the Project, as necessary, to comply with the applicable sound level limits:

- Specification of low-noise mechanical equipment and silencers: The ERU and RTUs will be of a low-noise design. The standby generator will be enclosed in an acoustic enclosure and equipped with a critical exhaust silencer for sound reduction.
- Acoustical shielding: Most of the rooftop equipment will be housed in either a fully enclosed penthouse or four-sided walls to reduce the mechanical noise impacts.
- Operational restrictions: The standby generator will only be operated when electrical service to the buildings is interrupted and for occasional brief daytime periods for the minimum acceptable amount of testing designated by the manufacturer.

With the mitigation outlined in Section 4.5, the Parcel 25 project will not create a noise nuisance condition and will fully comply with the most stringent sound level limits set by the Massachusetts DEP Noise Policy and the City of Boston Noise Regulations.

### 1.3.9 Geotechnical/Groundwater Impacts Analysis

It is anticipated that there will be little or no impact to the groundwater table due to the Proposed Project. While the Phase I Project does involve removal of some fill for foundations and grade beams, the buildings constructed in Phase I are expected to be slab on-grade with very little subsurface work required, and no work below the water table. For later phases, there will be excavation for underground parking including ledge removal. Dewatering will be required inside the excavation to remove groundwater and surface water runoff or rainwater during construction.

The proposed construction is not anticipated to have adverse effects on long-term groundwater levels because the lowest floor level in the fill areas is above the groundwater level and all levels in future phases that will be below the water table will be deep into ledge and not adjacent to pathways for groundwater movement. Roof drains and runoff from impermeable outdoor surfaces will be led to infiltration devices where there is sufficient capacity for percolation. In ledge areas, the drains will lead to detention cisterns of the required size and released gradually into storm drains. Where practical pervious paving will be used in outdoor hardscape areas.

Any groundwater removed from the excavation will be discharged under a NPDES general or exclusion permit. Construction mitigation measures will be incorporated into the Project to avoid the potential for ground movement and settlement during excavation, and potential impacts on, utility lines and the roadways.

The geotechnical analysis for the Project will also include a description of foundation construction methodology and amount and method of excavation with particular attention on measures to ensure groundwater levels will not be lowered during or after construction.

### 1.3.10 Construction Impacts Analysis

Section 4.8 describes impacts likely to result from the Full Build Project's construction. It is anticipated that there will be little impact from the Parcel 25 Project's construction and steps will be taken to avoid and minimize environmental and transportation - related impacts. The Proponent will select a general contractor that will be responsible for developing a construction phasing and staging plan and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

Construction for the Phase I project is expected to commence in the fourth quarter 2015 and will require approximately 12 months to complete. The subsequent phases are anticipated to be completed over a span of approximately five years.

The number of workers required for construction of the Proposed Project will vary during the three construction periods. However, it is anticipated that all construction workers will arrive and depart prior to peak traffic periods.

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, given the Proposed Project's close proximity to transit service (e.g., MBTA Orange Line, Green Line, as well as bus service), public transit use will be encouraged with the Proponent and general contractors working to ensure that construction workers are informed of the many public transportation options immediately adjacent to this area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The selected contractor will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

The Site abuts sidewalks on three streets. Pedestrian traffic may be temporarily impacted in these areas. The General Contractors will minimize the impact the construction of the proposed buildings will have on adjacent sidewalks.

Specific truck routes will be established with BTD through the Construction Management Plan ("CMP"). These established truck routes will prohibit truck travel on residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via Tremont Street directly to the site, not passing through residential areas of Mission Hill.

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will require that the general contractors comply with the Construction Management Plan developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The general contractors will be bound by each of the CMPs, which will establish the guidelines for the duration of the project phases and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Most construction activities will be accommodated within the current site boundaries. Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in the Construction Management Plans to be filed with BTD in accordance with the City's transportation maintenance plan requirements. To minimize transportation impacts during the construction period, there will be limited construction worker parking on-site, carpooling will be encouraged, secure on-site spaces will be provided for workers' supplies and tools so they do not have to be brought to the site each day, and subsidies for MBTA passes will be considered. The Construction Management Plans to be executed with the City prior to commencement of construction will document all committed measures.

### 1.3.11 Historic Resources Component

The site is currently vacant and blighted. According to files at the Massachusetts Historical Commission, there are no structures listed in the National or State Register of Historic Places, or the Inventory of Historical and Archaeological Assets of the Commonwealth on-site. It is not expected that the Project will cause adverse impacts on the historic or architectural elements of nearby historic resources outside the Project Site (see Section 5.0 for more detailed information on historic resources within $1 / 4$ mile of the Project Site).

### 1.3.12 Infrastructure Systems Component

An infrastructure system's analysis (Section 6.0) was completed by Nitsch Engineering, the Project's Civil Engineer, who found that the existing infrastructure surrounding the site is sufficient to service the needs of the Proposed Project. Highlights of the sewer, water and stormwater flow estimates and analysis are found in the paragraphs below.

## Project-Generated Sewage Flow

The Proposed Project will generate an estimated 33,780 gallons per day (gpd) of sewage flow based on design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program. Based on 314 CMR 07.00 for residential, retail, community and office space, the Proposed Project is expected to generate approximately 11,548 gallons per day (gpd) for Phase I, approximately 10,120 gpd for Phase II, and approximately 12,113 gpd for Phase III, a total of approximately $33,780 \mathrm{gpd}$.

## Sanitary Sewage Connection

The Proponent will coordinate with the Boston Water and Sewer Commission ("BWSC") on the design and capacity of the proposed connections to the existing system. It is anticipated that the proposed building's sanitary services will connect to either the 12 -inch sanitary main in Gurney Street, the 24 -inch by 36 -inch sanitary sewer main in Tremont Street and/or the 12 -inch sanitary sewer main in Station Street.

## Anticipated Water Consumption

The Proposed Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10\%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Proposed Project's estimated domestic water demand is $37,158 \mathrm{gpd}$.

## Proposed Water Service

The domestic and fire protection water services for the Proposed Project will connect to the existing BWSC water mains in Tremont Street, Gurney Street, and/or Station. Street.

### 1.3.13 Proposed Drainage Systems

The Proposed Project will be comprised of four buildings, paved areas, and some landscaped areas, but will be nearly 86 -percent ( $86 \%$ ) impervious cover, an increase over the existing condition. The Project, however, will reduce the existing peak rates of stormwater discharge, reduce volumes of stormwater runoff from the site, and promote runoff recharge to the greatest extent possible as well as substantially improve the water quality. The project will meet the Department of Environmental Protection's (DEP) Stormwater Management Standards for redevelopment.

It is expected that each building will have a separate underground subsurface infiltration system to collect stormwater from impervious areas and building roof. The infiltration systems will have overflows tied into the storm drain mains in Gurney Street, Tremont Street, Station Street and/or the Stony Brook Conduit, that will be used during large storm events. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged as prescribed in BWSC's Site Plan Requirements. Stormwater runoff from vehicular areas will be treated through the use of deep sump catch basins and water quality treatment structures. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

Improvements and connections to BWSC infrastructure will be reviewed as part of BWSC's site plan review process. The process will include a comprehensive design review of the proposed service connections, and assessment of Project demands and system capacity.

### 1.3.14 Transportation Component

Section 7.0 presents the comprehensive transportation study completed by HSH for the proposed Project in conformance with the BTD Transportation Access Plan Guidelines (2001). The study analyzes existing conditions within the Proposed Project study area, as well as conditions forecast to be in place under the five-year planning horizon of 2019.

The Proposed Project will provide a total of up to 201 parking spaces, which is consistent with Boston Transportation Department (BTD) guidelines in the Mission Hill neighborhood that call for a maximum of 0.5 to 1.0 spaces per residential unit and 0.75 to 1.0 spaces per 1,000 sf of nonresidential space. Vehicular access/egress will occur on Station Street and a proposed curb cut on Gurney Street to the Gurney Street Lot at Parcel 25B. All loading and service operations would occur on-site within a designated area off Station Street.

Primary pedestrian access to the buildings will be provided on Gurney Street and Tremont Street and via a proposed pedestrian plaza that will connect Tremont Street to Gurney Street through the site. The Proposed Project also wishes to formalize the existing informal use of a mid-block crossing on Tremont Street between Columbus Avenue and Gurney Street by installing a new crosswalk with curb extensions to shorten the pedestrian walking distance. This new crossing would provide a more direct connection between the new pedestrian plaza and the Roxbury Crossing Orange Line MBTA Station entrance.

The Proponent is committed to implementing a Transportation Demand Management ("TDM") program that supports the City's efforts to reduce dependency on the automobile by encouraging alternatives to driving alone, especially during peak travel periods. Proposed measures include, but are not limited to, designating an on-site transportation coordinator, secure covered bicycle parking, distribution of transit maps and schedules to residents, guests, and employees, and other measures.

The transportation analysis employs mode use data for the area surrounding the Project site based on 2000 U.S. Census data and BTD data for Area 5, and identifies the number of trips generated by the Project by mode. Due to the transit-oriented nature of the Project, and convenient location with respect to the Longwood Medical Area and non-auto alternatives such as Hubway, ZipCar, and the Southwest Corridor, is anticipated that many of the Project-generated .trips will occur via transit, on foot, and by bicycle.

At Full build, the Proposed Project will generate approximately 135 vehicle trips (114 in and 22 out) during the weekday morning peak hour and 171 vehicle trips during the weekday evening peak hour (44 in and 127 out). This corresponds to an increase of less than three vehicle trips per minute on the adjacent roadway network during the peak periods.

Due to the low volume of vehicle trips generated by the Proposed Phase I Project, the LOS at all study area intersections will remain unchanged from No-Build Conditions. The Phase I Build Condition is expected to generate only 31 vehicle trips during the morning peak hour and 48 vehicle trips during the evening peak hour. This corresponds to less than one new vehicle trip per minute, which is expected to have negligible impact on the adjacent roadway network. As such, mitigation is not warranted beyond providing safe vehicular and pedestrian access to and from the Project site and provision of TDM measures in support of the City's efforts to reduce dependency on the automobile. The Proponent will work with the BTD as part of the TAPA process to identify appropriate TDM measures that will take advantage of the site's transit oriented location. Under Full Build Conditions, several of the study area intersection will continue to operate at LOS E and F. At the completion of the Full Build condition, the Project is proposing signal timing improvements at the intersections of Tremont Street/Prentiss Street, Tremont Street/Malcolm X Boulevard/Columbus Avenue, Tremont Street/Gurney Street/Terrace Street, and Tremont Street/Parker Street as detailed in Section 7.0. It should be noted that signal timing improvements at the intersection of Tremont Street/Prentiss Street and Tremont Street/Malcolm X Boulevard/Columbus Avenue were proposed as part of the Parcel 3 Project; however, the

Project is still under review and the mitigation measures have not yet been finalized. All measures will be subject to review and discussion with BTD.

### 2.0 General Information

### 2.1 Applicant Information

### 2.1.1 Project Proponent

The Proponent is Mission Hill Parcel 25 LLC, an affiliated entity of Mission Hill Neighborhood Housing Services, Inc. ("Mission Hill NHS"). Mission Hill NHS is a community development corporation working to stabilize and improve the Mission Hill neighborhood since1974. Made up of 24 elected volunteers representing the eight residential districts, businesses, institutions, youth and the city, Mission Hill NHS is committed to involving all segments of the community in planning and implementing housing and economic development activities. These activities are designed to preserve Mission Hill's unique character, improve the standard of living of its lower-income residents, and enhance the quality of life for all who live and work there.

### 2.1.2 Project Team

Project Name: Mission Hill Parcel 25

| Property Owner/Developer | Mission Hill Parcel 25 LLC <br> C/o Mission Hill Neighborhood Housing Services, Inc. One Brigham Circle / M Level 1620 Tremont Street Mission Hill, MA 02120 Tel: 617-566-6565 <br> Patricia Flaherty, pflaherty@missionhillnhs.org <br> James Hoffman, ihoffman@missionhillnhs.org |
| :---: | :---: |
| Article 80/MEPA Permitting Consultant | Mitchell L. Fischman Consulting <br> ("MLF Consulting") LLC <br> 41 Brush Hill Road <br> Newton, MA 02461 <br> Tel: 781-760-1726 <br> Mitch Fischman, mitch.fischman@tetratech.com |


| Legal Counsel | WilmerHale LLP <br> 60 State Street <br> Boston, MA 02019 <br> Tel: 617-526-6216 <br> Katharine Bachman, katharine.bachman@wilmerhale.com |
| :---: | :---: |
| Architect | Goody Clancy <br> 420 Boylston Street <br> Boston, MA 02116 <br> Tel: 617-850-6536 <br> Rob Chandler, AIA, LEED robert.chandler@goodyclancy.com <br> Michael Freeley, LEED michael.freeley@goodyclancy.com |
| Development Consultant | Munkenbeck Consulting <br> 2 Hubbard Park Road <br> Cambridge, MA 02138 <br> Tel: 617-491-8999 <br> Peter Munkenbeck, peter@munkenbeck.com |
| Transportation Planner/Engineer | Howard/Stein-Hudson Associates, Inc. <br> 11 Beacon Street, $10^{\text {th }}$ Floor <br> Boston, MA 02108 <br> Joe SanClemente, jsanclemente@hshassoc.com <br> Tel: 617-348-3334 <br> Sarah Casey, scasey@hshassoc.com <br> Tel: 617-348-3337 |
| Civil Engineer | Nitsch Engineering <br> 2 Center Plaza, Suite 430 <br> Boston, MA 02108 <br> Tel: 857-206-8735 <br> Chelsea Christenson, cchristenson@nitscheng.com |
| Landscape Architect | Kyle Zick Landscape Architecture <br> 36 Bromfield Street, Suite 202 <br> Boston, MA 02108 <br> Tel: 617-451-1018 <br> Kyle Zick, kzick@kylezick.com |


|  | Tech Environmental, Inc. <br> Hobbs Brook Office Park <br> 303 Wyman Street, Suite 295 <br> Woise and Air Consultant <br> Tel: 781-890-22241 <br> Tel: <br> Mark C. Wallace, mwallace@techenv.com |
| :--- | :--- |
| Wind Engineering Consultant | Rowan Williams Davies \& Irwin Inc. <br> 650 Woodlawn Road West <br> Guelph, Ontario, Canada <br> N1K 1B8 <br> Tel: 591-823-1311 X2343 |
| Jordan Gilmour, iordan.gilmour@rwdi.com |  |$|$| Environmental/21E Engineer | Woodard \& Curran <br> 980 Washington Street, Suite 325 <br> Dedham, MA 02126 <br> Tel: 781-760-1726 |
| :--- | :--- |
| Peter Nangeroni, pnangeroni@woodardcurran.com |  |


| Schedule: Parcel 25 Phase 1 Project |  |
| :--- | :--- |
| Construction Commencement | Fourth Quarter 2015 |
| Construction Completion | Fourth Quarter 2016 |
| Construction Completion of <br> Remaining Project Phases | Spanning Over Approximately Five Years |
| Status of Project Design | Schematic |

### 2.1.3 Legal Information

## Legal Judgments or Actions Pending Concerning the Proposed Project:

None.

## History of Tax Arrears on Property Owned in Boston by the Applicant:

There are no tax arrears on property owned by the Proponent.

## Nature and Extent of Any and All Public Easements:

The Project Site is bounded by streets containing sewer, electric, telephone, and gas utilities. Additionally, there are BWSC and MBTA easements that extend across the Site.

### 2.2 Public Benefits

The development plan for the Proposed Project will provide substantial public benefits to the City of Boston and the Mission Hill neighborhood. The Proposed Project will generate both direct and indirect significant economic benefits. In fulfillment of the objectives of Article 59, Sections 59-29 through 59-32 of the Code and meeting the requirements of Section 80C-4 of the Code, the Development Plan and Proposed Project provides for:

- Revitalizing Roxbury Crossing as a lively transit-oriented area of activity with viable businesses, job training, much-needed housing, employment opportunities, and stabilizing retail, establishing a significant gateway to the Mission Hill Neighborhood;
- Creating 88 units of much-needed residential rental housing of which $100 \%$ will be affordable;
- Improving the walkability of the area and housing project reestablishing Gurney Street as a residential street;
- Creating a community gathering space for neighborhood residents and training space for youth;
- Providing much needed retail / commercial opportunities to attract businesses and employers to the area;
- Introducing office tenants who will provide support to the local community and utilize local businesses;
- Creating a new Pedestrian Plaza, a significant public open space amenity, with improved connections to numerous public facilities and amenities in the Mission Hill area;
- Enhancing a very active transportation node that includes the major MBTA Orange Line station at Roxbury Crossing and bus stop, and encouraging other alternative modes of transport such as the use of bikes and Zip Cars;
- Replacing a blighted lot used for construction project staging and other questionable activity, improving the safety and visual appearance of the area;
- Introducing street trees and other streetscape amenities to improve and enhance the pedestrian landscape and experience;
- Establishing a premier example of sustainable and environmentally responsible construction and development;
- Introducing a plan that is consistent with Mission Hill's community planning and zoning objectives;
- Benefitting the MBTA, as a condition of site activity, with infrastructure improvements, including relocation of utility services;
- Creating 450 construction jobs of one full year each ( 450 FTEs);
- Providing for 400 to 800 full time jobs (commercial/retail); and
- Adding new annual property taxes for the City of Boston.


### 2.3 Regulatory Controls and Permits

The Proposed Project is located within the Roxbury Crossing Community Commercial Subdistrict (CC-2) in the Mission Hill Neighborhood District. Pursuant to Article 3, Section 3-1A, Section 59-29, and Article 80, Section 80C of the Boston Zoning Code (the "Code"), the zoning for the Proposed Project is sought through a Planned Development Area Development Plan ("Development Plan") within a Special Purpose Overlay District Planned Development Area ("PDA"), and sets forth a statement of the development plan for an approximately 1.9 acre site at Gurney Street, Mission Hill, Boston, Suffolk County, Massachusetts (the "Site"), including Parcel 25 and Parcel 25B, the site at the northwest corner of Gurney Street, and description of property, location, and appearance and square footage of structures, open spaces and landscaping, proposed uses of the area, densities, traffic circulation, parking and loading facilities, access to public transportation, proposed dimensions of structures, and public benefits. The Proposed Project and the Site will be reviewed and be subject to Boston Redevelopment Authority (the "BRA") approval under the provisions of Article 80, Section 80C of the Code for PDA Development Plan review. The Development Plan is also intended to satisfy the requirements of Article 59 of the Code regarding Regulations Applicable in PDAs.

Upon approval, this Development Plan will constitute zoning for the Site in accordance with Section 31A and Article 80C of the Code. Under Section 80C-8 of the Code, no building, use or occupancy permit for the Proposed Project or any phase of the Proposed Project will be issued until the BRA has issued a Certification of Consistency for that phase under Section 80C-8 of the Code for the Project. To the extent that the Director of the BRA certifies consistency for a phase with this Development Plan with the issuance of a Certification of Consistency, that phase of the Proposed Project will be deemed in compliance with the requirements of the Code, pursuant to Section 80C-9 of the Code, to the extent that such requirements are addressed in this Development Plan. The Proponent will petition for Certificates of Consistency for the separate phases of the Proposed Project.

Conceptual illustrative plans showing the site context, general location of buildings, parcel and building areas, pedestrian and vehicular access areas, landscape improvements, and building elevations are included as a set of drawings incorporated at the end of Section 3.0.

### 2.3.1 Boston Zoning Code - Use Requirements

The Development Plan and Proposed Project will include residential, office, retail, and community space and accessory uses thereto. The Proposed Full Build Out Project may contain up to 201 parking spaces in both surface (accessible from Gurney Street) and below-grade garages (accessible from Station Street). The Proposed Project will provide services in an area that is presently lacking in such amenities.

### 2.3.2 Boston Zoning Code - Dimensional Requirements

As referenced, the Proposed Project is located within the Roxbury Crossing Community Commercial Subdistrict (CC-2) in the Mission Hill Neighborhood District. The CC-2 Subdistrict allows a maximum height of 160 feet and Maximum FAR of 5.0 in a PDA pursuant to Article 5930 of the Code. The Proposed Project has an anticipated FAR of 1.07 for the proposed Parcel 25 Phase 1 and 3.75 for the Full Build Out Proposed Project, but will not exceed an FAR of 5.0. In addition, the CC-2 Subdistrict requires no Minimum Lot Size, Minimum Lot Width, Minimum Lot Frontage, Minimum Front Yard, Minimum Side Yard, or usable open space per dwelling unit. The Proposed Project shall comply with the standards and requirements set forth in Article 59 of the Code applicable to PDAs.

For a project that is subject to Large Project Review, required off-street parking spaces and offstreet loading facilities are expected to be determined as a part of the Large Project Review in accordance with the provisions of Article 80 of the Boston Zoning Code. Design elements of the Proposed Project will also be reviewed pursuant to Large Project Review.

### 2.3.3 Preliminary List of Permits or Other Approvals Which May be Sought

| Agency Name | Permit or Action* |
| :---: | :---: |
| State Agencies |  |
| MA Executive Office of EOEEA: MEPA Office | MEPA Review; ENF; Request for EIR Waivers |
| MA Department of Environmental Protection, Division of Water Pollution Control | Sewer Connection Self Certification |
| MA Executive Office of Transportation and Construction | Chapter 40, Section 54A Clearance |
| MA Historical Commission | Determination of No Significant Impact |
| Local Agencies |  |
| Boston Redevelopment Authority | Article 80 Review and Execution of Related Agreements; Section 80B-6 Certificate of Compliance; PDA Plan Recommendation to the Boston Zoning Commission |
| Boston Transportation Department | Transportation Access Plan Agreement; Construction Management Plan |
| Boston Department of Public Works <br> Public Improvements Commission | Possible Sidewalk Repair Plan; Curb-Cut Permit; Street/Sidewalk Occupancy Permit; Permit for Street Opening; |
| Boston Zoning Commission | PDA Plan Approval |
| Boston Public Safety Commission Committee on Licenses | Permit for Storage of Fuel in (Emergency Storage) Tanks, Garage License |
| Boston Fire Department | Approval of Fire Safety Equipment |
| Boston Water and Sewer Commission | Approval for Sewer and Water and Connections; Construction Site Dewatering; and Storm Drainage |
| Boston Department of Inspectional Services | Building Permits; Certificates of Occupancy; Other Construction-Related Permits |

*This is a preliminary list based on project information currently available. It is possible that not all of these permits or actions will be required, or that additional permits may be needed.

### 2.4 Public Review Process and Agency Coordination

The vision for the Parcel 25 Development Plan grew out of a multi-year participatory planning process initiated by Mission Hill Neighborhood Housing Services, Inc. and involving hundreds of neighborhood residents, youth, and businesses owners. Participants included residents at the nearby Roxbury Crossing Condominiums, Alice Heyward Taylor Development, and the Mission Main Hope VI Development. Preliminary plans were presented back to individuals and community organizations at Community Workshop IV and became the basis for the submittal to the MBTA/BRA as part of the ITB process for site developer designation. Following designation several well-attended community meetings were held with the BRA to institute map and text amendments allowing for a PDA for this special study overlay district. The Proponent expects to hold additional community meetings during the PNF and PDA review period to share schematic design advances for the Parcel 25 Phase 1 Project and to update on the Proposed Full Build Out as provided for in the proposed PDA Plan.

The Proponent has discussed the Development Plan and Proposed Project with representatives of the Boston Redevelopment Authority ("BRA") prior to filing this Project Notification Form in order to identify issues/concerns as well as design requirements related to the Proposed Project and its phases. Meetings have been held with the BRA's planners, urban designers, and legal/zoning staff.

Individual meetings with federal, state and local elected officials have been ongoing, which has included representatives of the Executive Office of Energy and Environmental Affairs (MEPA Office) and the BWSC.

Abutting property owners including the MBTA and Wentworth Institute of Technology continue to be updated on a regular basis.

In accordance with Article 80 requirements, an Impact Advisory Group ("IAG") has been formed and BRA-sponsored neighborhood meeting will be scheduled to review the PNF and receive community comments on the Development Plan and Proposed Project during the public review period.

The Proponent will continue to meet with public agencies, neighborhood representatives, local business organizations, abutting property owners, and other interested parties, and will follow the requirements of Article 80 pertaining to the public review process.

### 2.5 Development Impact Payment ("DIP") Status

Based on current schematic design plans, it is not anticipated that Development Impact Payments ("DIP"), in accordance with Article 80B-7 of the Code, will be required for the Parcel 25 Phase 1 Proposed Project. That project is expected to have approximately 46,250 gross non-residential FAR square feet, and be below the $100,000 \mathrm{gsf}$ threshold where DIP is required. It is expected that Phase 3 of the Development Plan will have an office component at 161,500 gross FAR square feet and will trigger a Development Impact Payment which will be fully determined as part of that project's Article 80 Large Project Review.

### 3.0 Urban Design and Sustainability Component

### 3.1 Urban Design Overview

The Parcel 25 site is a transitional site at the edge of the Mission Hill Neighborhood - to the south is the wide expanse of Tremont Street, with the single story MBTA station on the opposite side. To the east, a series of wide urban belts - first the sunken MBTA tracks, then the southeast corridor linear park, and finally the six lane expanse of Columbus Avenue separates the site from any other above-grade structures. To the north, the adjacent properties are largely surface parking lots, although the corner of Station and Gurney Streets diagonally opposite the project site is occupied by small 2 and 4 story masonry structures, currently abandoned. The western side of the site is the only edge with significant existing buildings adjacent to the project parcel. These structures include 1 story windowless light industrial buildings, used by Wentworth Institute and the MBTA, and the four stories Roxbury Crossing Senior Building that is under construction. Further west, along Tremont Street are the three and four story zero-lot-line buildings that make up the Mission Hill neighborhood's historic fabric.

The Parcel 25 Phase I project consists of two separate structures - a requirement created by the need to avoid building over BWSC's Stony Brook Conduit, which cuts diagonally across the site. The larger structure follows close to the lot lines at Gurney and Tremont Streets, reconstructing the street walls on Gurney and Tremont that were lost when the previous generation of structures in this area were demolished, and reconnecting the urban fabric of the neighborhood further up the hill. The smaller structure is set back from the Tremont Street lot line (as required by a series of easements related to the adjacent Orange line tracks). This setback will be created as an urban public space that is an entry point to the on-site retail, an arrival point for pedestrian traffic across Tremont Street, and an ingress to the open space across the site, while holding the sidewalk edge. The smaller building, since it is not just at an entry point to the site, but also at a gateway point to the Mission Hill neighborhood, is designed with a highly visible glazed room facing Tremont Street and Columbus Avenue to be a beacon at the edge of the property.

Pedestrian access will be maintained across the site over the route of the Stony Brook conduit, through the pedestrian plaza. This will facilitate neighborhood access to the Roxbury Crossing MBTA station, particularly from the Mission Main Hope VI development just up Gurney Street, while knitting the project more closely into the urban fabric of the neighborhood. It will contain and channel pedestrian circulation paths that historically have cut across and through the vacant properties in this area. Much of the edge of the pedestrian plaza through the site is bounded by spaces that are only 2 -story tall, creating a smaller scale and since of greater intimacy.

The Full Build project will respond to a range of size and scale around the Project Site. The 4 and 5 story structures of Phase I and II, along with the Senior Housing project already underway across the street (at
four stories as well) respect the low-rise context of the Mission Hill neighborhood and re-establish Gurney as a comfortably scaled residential street.

These low-rise structures mediate between that scale and the larger size of the Phase III office building. At 160 feet high, located next to the MBTA tracks, the office building is part of existing and proposed large scale development along the MBTA Orange Line, located and built to a density to take advantage of the proximity to high quality transit service. Starting at the Ruggles Orange Line Station, these projects include Northeastern University office, research and dorm buildings, the proposed reconstruction of the Boston Housing Authority Whittier Street housing project, and the proposed commercial and residential project at Parcel 3. Closer to the Roxbury Crossing station, the recently constructed Whittier Health Center is comparable in scale, as is the development at 225 Center Street at the next stop at Jackson Square. Each of these projects along the Southwest Corridor, like the Phase III office building, is built to a scale that fully leverages the government investment in transit infrastructure to create rich, vital, active urban neighborhoods.

The Urban Design and Sustainability figures, including the 2009 LEED Checklist, are included at the end of this section (Figures 3.5-1 thru 3.5-39)

### 3.2 Building Design

The proposed Phase I project consists of two separate structures, the larger Building 1A, and the two story Building 1B. Both Phase I buildings will animate the surrounding streetscape with new retail space, as well as the comings and goings of residents, office tenants, and retail visitors. Primary entry points are spread around the perimeter of these structures to increase pedestrian activity - the residential lobby is on the Gurney Street façade, the retail entries face Tremont Street, and entry to the office and community spaces open to the Pedestrian Plaza over the Stony Brook conduit. The presence of street level retail will also extend the commercial character of Tremont Street (now composed largely of multi-story buildings with first floor retail) east down to the Tremont Street bridge, animating this important gateway to Mission Hill. Street trees, lighting, and crosswalks will be installed to make the plaza and the adjacent streets more attractive to pedestrians.

Building 1A closely follows the lot lines at Gurney and Tremont Streets, rebuilding the historic street wall of this neighborhood along Tremont and along the portion of Gurney between Tremont and the intersection with Halleck Street (aka the Gurney Street Extension). (The eventual Phase II residential structure will extend this street wall to the corner of Halleck and Station Streets). Building 1A is organized vertically with a one story masonry base along Gurney, and a two story masonry base along Tremont, with a body of residential and office uses above it. Large glazed openings into the retail spaces along Tremont, and to the office spaces along Gurney provide appealing, engaging frontage welcoming pedestrians, and spilling light onto the sidewalks at night. A series of vertical bays in the body of the building organize it into approximately 36 foot wide modules, relating to the prevailing rhythm of the neighborhood, and connecting to the scale, grain, and active silhouette of existing buildings around it along Tremont. Those bays extend down into the office space on the second floor, simplifying the visual organization of the multiple programs in the building.

Building 1B's design places the large transparently glazed space of the training program to the front on the upper floor, acting as a beacon, marking an important entrance to the project, and, along with the balance of the project, the eastern gateway of the Mission Hill neighborhood. Its two story elevation facing the pedestrian plaza, along with the two story wall of the office portion of Building 1 A facing the plaza, shape and intimately scaled outdoor room at the core of the project.

The loading and service area is centrally, but unobtrusively located behind Building 1B, and accessed by trucks from Station Street. This allows the dock to be to be central and convenient to the various program elements, while not consuming any of the Tremont or Gurney Street facades for truck access.

The Proponent is committed to adopting materials that are consistent with the surrounding context. The street elevations have been designed to match the height and scale of other buildings in the surrounding streetscape. The facades will mix masonry (primarily at the building's base) with metal and cement-fiber finish siding, reflecting on both the masonry structures and the wood frame three-deckers and other residential buildings along Tremont Street.

### 3.3 Sustainable Design/Energy Conservation

### 3.3.1 Introduction

Sustainability informs every design decision. Enduring and efficient buildings conserve embodied energy and preserve natural resources. The full development of Parcel 25 embraces the opportunity to positively influence the urban environment. Its urban location takes advantage of existing infrastructure while convenient access to mass transportation will reduce dependence on single occupant vehicle trips and minimize transportation impacts.

The Proponent and the Project design team are committed to an integrated design approach and is using the LEED for New Construction 2009 rating system and intends to be LEED Silver certifiable as presented in Figure 3.5-39 at the end of this section. This rating will meet or exceed Boston's Green Building standard. The LEED rating system tracks the sustainable features of the project by achieving points in following categories: Sustainable Sites; Water Efficiency; Energy and Atmosphere; Materials and Resources; Indoor Environmental Quality; and Innovation and Design Process.

### 3.3.2 Sustainable Sites

The development of sustainable sites is at the core of sustainable design. The sustainable sites credit category encourages development on previously developed land, minimizing a building's impact on ecosystems and waterways, regionally appropriate landscaping, smart transportation choices, stormwater runoff management, and reduction of erosion, light pollution, heat island effect, and pollution related to construction and site maintenance.

The previously developed site features connectivity to basic services in the community and is located in an urban setting that is well served by the existing utility infrastructure. The site's
adjacency to basic services in the community and the development density of its urban context enable the project to satisfy available approaches to the Development Density and Community Connectivity credit. Access to the MBTA Orange line, significant numbers of nearby bus lines, and on-site bike storage will offer residents and visitors environmentally sound transportation alternatives. Coupled with alternative parking options, the Project expects to significantly reduce parking capacity. Through these approaches, the Project also achieves many of the Alternative Transportation credits.

Underground stormwater detention and recharge systems will assist in meeting Stormwater Design-Quantity credit. To achieve Heat Island Effect credits and minimize the project's impact on the creation of urban heat islands, a combination of high-albedo roofing membrane and planted site areas will maximize solar reflectance and minimize heat gain.

### 3.3.3 Water Efficiency

Buildings are major users of our potable water supply and conservation of water preserves a natural resource while reducing the amount of energy and chemicals used for sewage treatment. The goal of the Water Efficiency credit category is to encourage smarter use of water, inside and out. Water reduction is typically achieved through more efficient appliances, fixtures and fittings inside and water-wise landscaping outside. To satisfy the requirements of the Water Use Reduction Prerequisite and credit, the project will incorporate water conservation strategies that include low flow plumbing fixtures for water closets and faucets. Further, drought tolerant plant species will be specified in landscaped areas to eliminate the requirement for irrigation in most areas and satisfy the requirements for the Water Efficient Landscaping credit.

### 3.3.4 Energy and Atmosphere

According to the U.S. Department of Energy, buildings use 39\% of the energy and 74\% of the electricity produced each year in the United States. The Energy and Atmosphere credit category encourages a wide variety of energy strategies: commissioning; energy use monitoring; efficient design and construction; efficient appliances, systems and lighting; the use of renewable and clean sources of energy, generated on-site or off-site; and other innovative practices.

To meet the Optimize Energy Performance credit, the building envelope will include high performance glazing systems and both stud cavity and continuous insulation at most wall systems. In addition, the placement and sizing of windows is intended to reduce daytime interior lighting needs, and improve winter heat gain without adding significant summer heat gain. LED, halogen or fluorescent bulbs are used in light fixtures throughout the property. These lights use much less energy, generate less heat and last much longer than incandescent bulbs.

The Project will meet or exceed the ASHRAE 90.1-2007 standard for Minimum Energy Performance through a variety of measures. Further, no chlorofluorocarbon (CFC) based refrigerants will be used in the project to reduce ozone depletion in the atmosphere and satisfy the

Fundamental Refrigeration Management prerequisite. Fundamental Commissioning of Building Energy Systems will be performed to ensure that systems are operating at peak efficiency. In addition, Enhanced Commissioning will assess the performance of energy and water systems during the first days of building operation and can help to bring additional efficiency to the systems for the life of the building.

### 3.3.5 Materials and Resources

During both construction and operations, buildings generate a lot of waste and use a lot of materials and resources. This credit category encourages the selection of sustainable materials, including those that are harvested and manufactured locally, contain high-recycled content, and are rapidly renewable. It also promotes the reduction of waste through building and material reuse, construction waste management, and ongoing recycling programs.

The project includes recycling facilities within the building for the convenience of the occupants in accordance with the requirements of the Storage and Collection of Recyclables prerequisite. A Demolition and Construction Waste Management Plan will be implemented to divert construction waste material from landfills per the Construction Waste Management credit. Building materials will be specified based on their recycled content and proximity of extraction and manufacturing locations to the project site such that points will be achieved in each of the Recycled Content and Regional Materials credits.

### 3.3.6 Indoor Environmental Quality

The U.S. Environmental Protection Agency estimates that Americans spend about 90\% of their day indoors, where the air quality can be significantly worse than outside. The Indoor Environmental Quality credit category promotes strategies that can improve indoor air through low emitting materials selection and increased ventilation. It also promotes access to natural daylight and views.

During construction, an indoor air quality management plan will be implemented to prevent contamination of mechanical systems and absorptive materials. Material specifications will include only low-emitting interior finishes for paints, carpets, and woods to preserve indoor air quality. Occupants will also have control over lighting and their thermal environment and rooms will have access to daylight and views.

### 3.3.7 Innovation and Design Process

The Innovation in Design and Innovation in Operations credit categories provide additional points for projects that use new and innovative technologies, achieve performance well beyond what is required by LEED credits, or utilize green building strategies that are not specifically addressed elsewhere in LEED. This credit category also rewards projects for including a LEED Accredited

Professional on the team to ensure a holistic, integrated approach to design, construction, operations and maintenance.

Given the cost of facility operation, operating strategies from LEED for Existing Buildings: Operations \& Maintenance are being analyzed for incorporation into Innovation in Design credits. Sustainable operating practices include sustainable purchasing, an integrated pest management and landscape management program, and a green housekeeping program. These strategies limit the ongoing impact the project has on the environment. Sourcing of green cleaning products and reductions in the amount of fertilizers, fungicides, and pesticides used on the property minimize the exposure of guests, staff, and the local habitat to harsh chemicals. Environmentally Preferable Purchasing reduces environmental impact from the project vendors and suppliers.

### 3.4 Landscape Design

The proposed landscape plan for Parcel 25 addresses multiple scales of the urban landscape as well as multiple scales in time, since the phased project means that there will be a one or more intermediate stops between the predevelopment an final post-development conditions. Landscape design will address the street and public realm at the pedestrian plaza and Tremont and Gurney Street sidewalks, a future elevated plaza between the residential and office components of the full build out, as well as the edge treatments of the residential spaces to create a sense of privacy from the street. Landscape design will also address the interim states between the completion of Phase I and the full build out, where landscape screening for the surface parking areas will be required, in addition to landscape treatments for the undeveloped portions of the site.

The street landscape creates a unified and cohesive vocabulary that responds to the differing scale and activity along Tremont Street and Gurney Street. Differing rhythms of street trees will be provided at Tremont and Gurney Streets. At Tremont Street the wider spacing of these reflects the larger scale of the street, and makes room for benches and bike racks consistent with Tremont Street's role as a busy urban thoroughfare. The street trees will be more closely spaced on the narrower and more residential sidewalks at Gurney Street. Through tree and other plantings, lighting, placement of street furniture, and finish of sidewalks, these sections of sidewalks will be improved for a better pedestrian experience, while still maintaining the linkages to the uses, scale, and design vocabulary of the surrounding areas. Paving patterns within the site will use a mixed language of "islands" demarking key points of use or arrival, such as the sidewalk access points and the major entries to the office component and community room and curving "flows" that connect these points and direct traffic through the site. Large planter areas are carved out by these flows against the sides of the buildings, and smaller planters will accent particular spots. The use of curves and circular patterns helps define a different sense of space and use for the pedestrian only plaza, as compared to the sidewalks and streets surrounding the property. Landscape zones strategically placed through the pedestrian plaza areas serve to break down the scale of the spaces, define separate outdoor urban spaces, and separate the differing zones within the pedestrian circulation,

### 3.5 Urban Design Drawings and LEED Checklist

Urban design drawings and perspectives, and the LEED Checklist for Phases I and II and the Full Build Project include:

Figure 3.5-1: Locus Plan
Figure 3.5-2: Site Survey - Existing Condition
Figure 3.5-3: $\quad$ Site Existing Condition
Figure 3.5-4: $\quad$ Site Existing Condition
Figure 3.5-5: Phase I - Site Plan
Figure 3.5-6: Phase I - Site Aerial View
Figure 3.5-7: Phase II - Site Plan
Figure 3.5-8: Phase II - Site Aerial View
Figure 3.5-9: Full Build- Site Plan
Figure 3.5-10: Full Build- Site Aerial View
Figure 3.5-11: Phase I - Level 1 Plan
Figure 3.5-12: Phase I - Level 2 Plan
Figure 3.5-13: Phase I - Level 3 Plan
Figure 3.5-14: Phase I - Level 5 Plan
Figure 3.5-15: Phase I - Roof/Penthouse Plan
Figure 3.5-16: Phase I - Building Entrances- Codified
Figure 3.5-17: Phase I - Service Diagram- Loading
Figure 3.5-18: Phase I - Service Diagram- Trash
Figure 3.5-19: Phase II - Level 1 Plan
Figure 3.5-20: Full Build - Landscape Plan
Figure 3.5-21: Full Build - Level 1 Plan
Figure 3.5-22: Full Build - Level 2 Plan
Figure 3.5-23: Full Build - Level 3 \& 4 Plan
Figure 3.5-24: Full Build - Level 5 Plan
Figure 3.5-25: Full Build - Level 6, 7, 8, 9, \&10 Plan
Figure 3.5-26: Full Build - Roof/Penthouse Plan
Figure 3.5-27: Full Build - Section A
Figure 3.5-28: Full Build - Section B
Figure 3.5-29: Full Build - View from Tremont Street and Columbus Avenue
Figure 3.5-30: Full Build- View from Roxbury Crossing MBTA Station
Figure 3.5-31: Full Build - View from Tremont Street and Terrace Street
Figure 3.5-32: Full Build - View North on Gurney Street
Figure 3.5-33: Full Build - View from Gurney Street towards Pedestrian Plaza
Figure 3.5-34: Full Build - View of Pedestrian Plaza
Figure 3.5-35: Full Build - Regional Context
Figure 3.5-36: Full Build - Regional Context
Figure 3.5-37: Full Build - Regional Context
Figure 3.5-38: Phase I - Elevations 1
Figure 3.5-39: Phase I - LEED Checklist
PROGRAM



Locus Plan



иo!!!puoう бu!ls!x]

Site
Existing Condition






























Parcel 3
(Massing shown is
per tentative BRA

designation)


| Whittier Health Center |
| :---: |

Reggie Lewis Center Regsie Lewis Center


SW Corridor Park
Parcel 25 | MHNHS
Figure 3.5-36

Figure $3.5-37$





| 2 | 0 | 2 | Regional Priority | Possible Points: | 4 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $\mathbf{1}$ |  |  | Credit 1 | Regional Priority: Specific Credit | 1 |
| 1 |  |  | Credit 2 | Regional Priority: Specific Credit | 1 |
|  |  | 1 | Credit 3 | Regional Priority: Specific Credit | 1 |
|  |  | 1 | Credit 4 | Regional Priority: Specific Credit | 1 |

[^0]| 0 |
| :--- |
| 0 |
| 0 |
| 0 |

## Parcel 25 | MHNHS <br> Figure 3.5-39

LEED v4 for BD+C: New Construction and Major Renovation Project Checklist
(2)

Proj ect Name
Date

| 14 | 2 | 0 | Location and Transportation |  | Possible Points: | 16 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 0 | Credit 1 | LEED for Neighborhood Development Location |  | 16 |
| 1 |  |  | Credit 2 | Sensitive Land Protection |  | 1 |
|  | 2 |  | Credit 3 | High Priority Ste |  | 2 |
| 5 |  |  | Credit 4 | Surrounding Density and Diverse Uses |  | 5 |
| 5 |  |  | Credit 5 | Access to Quality Transit |  | 5 |
| 1 |  |  | Credit 6 | Bicycle Facilities |  | 1 |
| 1 |  |  | Credit 7 | Reduced Parking Footprint |  | 1 |
| 1 |  |  | Credit 8 | Green Vehicles |  | 1 | $\left.\left.\square\right|^{\mid 1}\right|_{\text {catin }}$




### 4.0 Environmental Protection Component

### 4.1 Pedestrian Wind Assessment

Rowan Williams Davies \& Irwin Inc. (RWDI) was retained by the Proponent to assess the potential wind conditions for Parcel 25 Phases I and Full Build (with Phases II and III). The objective of this assessment was to provide a qualitative evaluation of wind comfort on and around the proposed development and recommend mitigation measures, if necessary. The full Pedestrian Wind Assessment is contained in Appendix B, and the assessment's conclusions are summarized in the paragraphs that follow.

Due to the limited height of the Phases I and II proposed buildings, RWDI's opinion is that these buildings will not cause any adverse wind impact on the surrounding area. The resultant wind conditions on and around the Project site are predicted to meet the BRA effective gust criterion throughout the year.

The proposed Phase III building is expected to be approximately 11 stories in height and RWDI suggested that it will cause some localized wind flow accelerations, but the resultant wind conditions are predicted to be appropriate for all grade areas, including building entrances, sidewalks and parking lots. No adverse wind impact is anticipated from the Proposed Project to and from the Ruggles Orange Line MBTA Station, the nearby Southwest Corridor Park or adjacent public streets and sidewalks.

RWDI has advised that if public use is planned for the elevated plaza between Phases II and III buildings, and wind conditions warrant, wind mitigation measures should be considered in the form of landscaping, wind screens, tall parapets and trellises. Photograph examples of wind mitigation have been provided by RWDI in its Assessment in Appendix B.

### 4.2 Shadow Impacts Analysis

### 4.2.1 Introduction

The following shadow study describes and graphically depicts anticipated new shadow impacts from the Proposed Project compared to shadows from existing buildings. The study presents the existing and built conditions for the proposed Project for the hours 9:00 AM, 12:00 Noon, and 3:00 PM for the vernal equinox, summer solstice, autumnal equinox, and winter solstice. In addition, shadows are depicted for 6:00 PM during the summer solstice and autumnal equinox.

### 4.2.2 Vernal Equinox (March 21)

Figures 4.2-1 through 4.2-3 depict shadows on March 21.
At 9:00 AM, shadows are cast in a westerly direction onto portions of Gurney Street and the adjacent Senior Housing building. The Phase III structure would cast shadows onto the MBTA
substation and Wentworth garage, though since these buildings are windowless and not regularly occupied, the actual effect will be minimal. .

At 12:00 Noon, shadows are cast in a northerly direction on to Gurney Street, Station Street, and the parking lots to the north, however, even in the full build-out, shadow impacts on adjacent structures are minimal.

At 3:00 PM, shadow from the project in the full-build condition is cast northeasterly across Station Street onto the parking lots on the opposite side. The only shadow impact during Phase I at this time would lie entirely within the site.

### 4.2.3 Summer Solstice (June 21)

Figures 4.2-4 through 4.2-7 depict shadow impacts on June 21.
At 9:00 AM, during the Phase I shadows are cast westward onto Gurney Street although there will be a minimal shadow impact on the adjacent Senior Housing building.

At 12:00 Noon, new shadow is cast to the north in the full-build condition onto Station Street, and onto parts of Gurney Street. During Phase I, shadow impacts would only occur on Gurney Street.

At 3:00 PM, at the Full build out, new shadow from the Project is cast in a northeasterly direction onto Station Street and the parking lots on the far side, as well as onto the MBTA tracks, although these are also partially shaded by the wall of the boat section. These shadows are generated principally by the Phase III structure. During Phase I, there would be no offsite shadow impact at this time.

At 6:00 PM, new shadow from the Full build-out is cast in an easterly direction onto Station Street and across the MBTA tracks, Southeast Corridor Park, and on portions of Columbus Avenue. These shadow impacts are principally generated by the Phase III component. During Phase I, shadows would fall only onto the MBTA tracks, which are largely in shadow at his time already, due to the depth of the tracks below grade.

### 4.2.4 Autumnal Equinox (September 21)

Figures 4.2-8 through 4.2-11 depict shadow impacts on September 21.
At 9:00 AM during Phase I, shadows are cast in a westerly direction onto portions of Gurney Street and the adjacent Senior Housing building. During Phases II and III, shadows would extend onto the MBTA substation and Wentworth garage, although since these buildings are windowless and not regularly occupied, the actual effect will be minimal.

At 12:00 Noon during Phase I, shadows are cast in a northerly direction onto Gurney Street, Station Street, and the parking lots to the north, however, even in the Full build-out condition, shadow impacts on adjacent structures are minimal.

At 3:00 PM, shadow from the Full build-out is cast northeasterly across Station Street to the parking lots on the opposite side, as well as a minimal shadow impact on to the MBTA tracks, in the full-build condition. The Phase I only shadow impact at this time would lie entirely within the site.

At 6:00 PM, new shadow from the Full build out is cast in an easterly direction across Station Street, the MBTA tracks, southeast corridor park, Columbus Avenue, and on to the Reggie Lewis center. Shadows from Phase I only would not reach as far, stopping at Columbus Avenue. The actual impact at this time is, however, fairly small due to the rising ground to the west of the site and there are already significant shadow impacts from existing structures.

### 4.2.5 Winter Solstice (December 21)

Figures 4.2-12 through 4.2-14 depict shadow impacts on December 21 . Winter sun casts the longest shadows of the year.

At 9:00 AM, shadows are cast in a westerly direction across Gurney Street. The full-build condition will cast shadow onto the abandoned buildings across Station and Halleck Streets, as well as onto the Senior Housing building across Gurney Street. Impacts on other properties are small, as these properties are already impacted by shadows from other existing buildings.

At 12:00 Noon, new shadow is cast in a northerly direction onto Station Street Gurney Street, and to the parking lots north of Station Street.

At 3:00 PM, new shadow from the Full build-out is cast in a northeasterly direction mostly onto Station Street and the parking lots beyond. During Phase I, shadow impacts at this time would largely stay on site.

### 4.2.5 Summary

Even with the proposed height of Phase III extending to 160 feet, the Full build-out shadow impacts are generally not extensive. New shadow is generally limited to the streets surrounding the Site. Although late afternoon and evening shadows will extend in an easterly/northeasterly direction toward the Southeast Corridor and Columbus Avenue, most of these lots and areas are currently impacted by current shadow from existing buildings. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and surrounding areas.

## Shadow Study

March 21 | 9:00 a.m. | Alt 33.0 | Azm 125.7

| Legend  <br> $\square$ Existing Buildings <br> $\square$ Proposed Buildings <br>  Shadow <br> T Transit Station |
| :--- | :--- |



Parcel 25
Figure 4.2-1

## Shadow Study

March 21 | 12:00 Noon | Alt 48.0 | Azm -176.9


Parcel 25
Figure 4.2-2


Parcel 25
Figure 4.2-3

## Shadow Study

March 21 | 6:00 p.m. | Alt 9.9 | Azm -98.4


## EXISTING CONDITIONS



PROPOSED

Figure 4.2-4


## Shadow Study

June 21 | 12:00 Noon | Alt 68.8 | Azm 149.4

| Legend |  |
| :---: | :---: |
|  | Existing Buildings |
|  | Proposed Buildings |
|  | Shadow |
| ( | Transit Station |



## EXISTING CONDITIONS



Parcel 25
Figure 4.2-6


## Shadow Study

June 21 | 6:00 p.m. | Alt 23.9 | Azm -79.3

| Legend <br> $\square$ <br> $\square$ <br> Existing Buildings <br> Proposed Buildings <br> Shadow <br> (T) |
| :--- |


EXISTING CONDITIONS


## Shadow Study

September 21 | 9:00 a.m. | Alt 25.9 | Azm 115.3


Goody
Clancy

Parcel 25
Figure 4.2-9

## Shadow Study

September 21 | 12:00 Noon | Alt 47.4 | Azm 166.0

| Legend |  |
| :--- | :--- |
| $\square$ | Existing Buildings |
| $\square$ | Proposed Buildings |
|  | Shadow |
| T | Transit Station |



EXISTING CONDITIONS


Parcel 25
Figure 4.2-10

## Shadow Study

September 21 | 3:00 p.m. | Alt 37.4 | Azm -132.9

| Legend <br> $\square$ <br> $\square$ | Existing Buildings |
| :--- | :--- |
|  | Shadow |
| T | Transit Station |



EXISTING CONDITIONS


Parcel 25
Figure 4.2-11

## Shadow Study

September 21 | 6:00 p.m. | Alt 7.3 |Azm -96.0


EXISTING CONDITIONS


PROPOSED

## Shadow Study

December 21 | 9:00 a.m. | Alt 14.2 |Azm 141.9

## Legend

$\square$ Existing Buildings

Proposed Buildings

Shadow
(T) Transit Station


## EXISTING CONDITIONS



## PROPOSED

Parcel 25
Figure 4.2-13

## Shadow Study

December 21 | 12:00 Noon | Alt 24.1 |Azm -175.6

| Legend  <br> $\square$ Existing Buildings <br> $\square$ Proposed Buildings <br>  Shadow <br> (T) Transit Station |
| :--- | :--- |

## Shadow Study

December 21 | 3:00 p.m. | Alt 10.0 |Azm -135.1

## Legend

Existing Buildings

Proposed Buildings

Shadow
(T) Transit Station


EXISTING CONDITIONS


PROPOSED

Goody
Clancy

Parcel 25
Figure 4.2-15

### 4.3 Air Quality

Tech Environmental, Inc. performed air quality analyses for the proposed mixed-use residential/retail development at the Parcel 25 in Boston, MA. 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 parking garages, and 3) a microscale CO analysis for intersections in the Project area that meet the BRA criteria for requiring such an analysis.

### 4.3.1 Existing Air Quality

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 4.3-1). 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 ("DEP") currently operates air monitors in various locations throughout the city. The closest, most representative, DEP monitors for carbon monoxide (CO), sulfur dioxide $\left(\mathrm{SO}_{2}\right)$, nitrogen dioxide $\left(\mathrm{NO}_{2}\right)$, fine particulate matter $\left(\mathrm{PM}_{2.5}\right)$, coarse particulate matter $\left(\mathrm{PM}_{10}\right)$, and lead are located at Dudley Square at Harrison Avenue, Boston, MA. The closest, most representative, DEP monitor for ozone is located at Dudley Square (Harrison Avenue).

Table 4.3-2 summarizes the DEP air monitoring data, for the most recent available, complete, three-year period (2010-2012), that are considered to be representative of the project area. Table 4.4-2 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 $\mathrm{PM}_{2.5 .}$. 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 $\mathrm{PM}_{2.5}$ concentrations.

Table 4.3-1. Massachusetts and National Ambient Air Quality Standards (NAAQS)

| Pollutant | Averaging Time | NAAQS ( $\mu \mathrm{g} / \mathrm{m}^{3}$ ) |
| :---: | :---: | :---: |
| $\mathrm{SO}_{2}$ | $\begin{gathered} 1 \text {-hour }{ }^{\mathrm{P}} \\ \text { Annual }^{\mathrm{P}} \text { (Arithour }{ }^{\mathrm{P}} \\ \text { (Aric Mean) } \end{gathered}$ | $\begin{gathered} 196^{a} \\ 365^{b} \\ 80 \end{gathered}$ |
| CO | 1-hour ${ }^{P}$ 8 -hour ${ }^{P}$ | $\begin{aligned} & 40,000^{b} \\ & 10,000^{b} \end{aligned}$ |
| $\mathrm{NO}_{2}$ | $\text { Annual }^{\text {P/S }} \begin{aligned} & \text { 1-hour }{ }^{\mathrm{P}} \\ & \text { (Arithmetic Mean) } \end{aligned}$ | $\begin{aligned} & 188^{\mathrm{c}} \\ & 100 \end{aligned}$ |
| PM 10 | 24 -hour ${ }^{\text {H/S }}$ | 150 |
| $\mathrm{PM}_{2.5}$ | $\begin{gathered} 24 \text {-hour }{ }^{\mathrm{P} / \mathrm{S}} \\ \text { Annual }^{\mathrm{P} / \mathrm{S}} \text { (Arithmetic Mean) } \end{gathered}$ | $\begin{aligned} & 35^{\mathrm{d}} \\ & 12^{\mathrm{e}, f} \end{aligned}$ |
| $\mathrm{O}_{3}$ | 8 -hour ${ }^{\text {P/S }}$ | $147^{9}$ |
| Pb | $\begin{aligned} & \text { Rolling 3-Month Avg }{ }^{\text {P/S }} \\ & \text { Calendar Quarter } \\ & \text { (Arithmetic Mean) } \end{aligned}$ | $\begin{gathered} 0.15 \\ 1.5 \end{gathered}$ |

$\mathrm{P}=$ primary standard; S = secondary standard.
${ }^{\text {a }} 99$ th percentile 1-hour concentrations in a year (average over three years).
${ }^{\mathrm{b}}$ One exceedance per year is allowed.
${ }^{\text {c }} 98$ th percentile 1-hour concentrations in a year (average over three years).
${ }^{d} 98$ th percentile 24 -hour concentrations in a year (average over three years).
${ }^{e}$ Three-year average of annual arithmetic means.
${ }^{\dagger}$ As of March 18, 2013, the U.S. EPA lowered the $\mathrm{PM}_{2.5}$ annual standard from $15 \mathrm{ug} / \mathrm{m}^{3}$ to 12 $\mathrm{ug} / \mathrm{m}^{3}$.
${ }^{9}$ Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed $0.075 \mathrm{ppm}\left(147 \mathrm{ug} / \mathrm{m}^{3}\right)$ (effective May 27,2008 ) and the annual $\mathrm{PM}_{10}$ standard was revoked in 2006.

Table 4.3-2. Representative Existing Air Quality in the Project Area

| Pollutant, <br> Averaging <br> Period | Monitor Location | Value <br> $\left(\mathbf{u g} / \mathbf{m}^{3}\right)$ | NAAQS <br> $\left(\mathbf{u g} / \mathbf{m}^{3}\right)$ | Percent of <br> NAAQS |
| :--- | :--- | :---: | :---: | :---: |
| $\mathrm{CO}, 1$-hour | Harrison Avenue, Boston | 2,863 | 40,000 | $7 \%$ |
| $\mathrm{CO}, 8$-hour | Harrison Avenue, Boston | 2,061 | 10,000 | $21 \%$ |
| $\mathrm{NO}_{2}, 1$-hour | Harrison Avenue, Boston | 93.4 | 188 | $50 \%$ |
| $\mathrm{NO}_{2}$, Annual | Harrison Avenue, Boston | 34.8 | 100 | $35 \%$ |
| Ozone, 8-hour | Harrison Avenue, Boston | 131 | 147 | $89 \%$ |
| $\mathrm{PM}_{10}$, 24-hour | Harrison Avenue, Boston | 41 | 150 | $27 \%$ |
| $\mathrm{PM}_{2.5}, 24$-hour | Harrison Avenue, Boston | 21.3 | 35 | $59 \%$ |
| $\mathrm{PM}_{2.5}$, Annual | Harrison Avenue, Boston | 8.4 | 12 | $69 \%$ |
| Lead, Quarterly $^{\text {Harrison Avenue, Boston }}$ | 0.017 | 1.5 | $1.1 \%$ |  |
| $\mathrm{SO}_{2,1} 1$-hour | Harrison Avenue, Boston | 47.4 | 196 | $24 \%$ |

Source: MassDEP, http://www.mass.gov/dep/air/priorities/aqreports.htm., downloaded May 12, 2014.
Notes:
(1) Annual averages are highest measured during the most recent three-year period for which data are available (2010-2012). 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 $\mathrm{PM}_{2.5}$ value is the 3-year average of the 98th percentile values, the annual $P M_{2.5}$ 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 $\mathrm{NO}_{2}$ value is the 3 -year average of the 98 th percentile values and the one-hour $\mathrm{SO}_{2}$ 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 $\mathrm{PM}_{10}$ standard was revoked in 2006 and the 3-hour $\mathrm{SO}_{2}$ standard was revoked by the US EPA in 2010.

### 4.3.2 Impacts from Parking Garage Ventilation

The Parcel 25 project will include two parking garages, located below ground, designed to provide parking spaces for 126 vehicles. An analysis of the worst-case air quality impacts from the proposed parking garages was performed (see Appendix B). The procedures used for this analysis are consistent with U.S. EPA's Volume 9 guidance. ${ }^{1}$ The objective of this analysis was to determine the maximum CO concentrations inside the garages and at the closest sensitive receptors surrounding the Project. These closest sensitive receptors include: nearby existing buildings and pedestrians at ground level anywhere near the Project. CO emissions from motor

[^1]vehicles operating inside the garage were calculated and the CO concentrations inside the garages and surrounding the Project were based on morning and afternoon peak traffic periods. The garage exhaust CO emissions were modeled using an U.S. EPA-approved air model.

## Garage Ventilation System

The proposed underground parking garages will 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 garages will require a maximum flow of approximately 111,600 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 garages to safe levels before they are vented outside. The garage ventilation exhausts will likely be located at two vertical vents.

## Peak Garage Traffic Volumes

Parking for the Proposed Project will be provided in Phase II and Phase III underground garage. Access to the garages will be provided by ramps along the north side of the Project Site off of Station Street. The peak morning and afternoon one-hour entering and exiting traffic volumes for the garages are shown in Table 4.3-3.

Table 4.3-3. Peak Hour Garages Traffic Volumes

| Period | Entering <br> (vehicles/hour) | Exiting <br> (vehicles/hour) | Total |
| :--- | :---: | :---: | :---: |
| (vehicles/hour) |  |  |  |
| Morning Peak Hour | 121 | 29 | 150 |
| Afternoon Peak Hour | 40 | 114 | 154 |

Source: Howard-Stein Hudson, Inc.

## Motor Vehicle Emission Rates

The U.S. Environmental Protection Agency (EPA) MOBILE6.2 emission factor model was used to calculate single vehicle CO emissions rates, for a vehicle speed of 5 mph . The inputs to the MOBILE6.2 model followed the latest guidance from the Massachusetts Department of Environmental Protection (DEP) and were performed for the baseline traffic year of 2014. This represents the worst case, since the MOBILE6.2 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 MOBILE6.2, for a speed of 5 mph , was 14.82 grams per mile (gpm) for each entering and exiting vehicle. These emission rates apply to wintertime conditions when motor vehicle CO emissions are greatest due to cold temperatures. MOBILE6. 2 model output is provided in the Appendix C.

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

## Peak Garage CO Emission Rate and CO Concentration Inside the Garage

The peak one-hour CO emission rate for the Phase II parking garage was calculated to be 1.27 grams per minute for the morning peak hour and 1.31 grams per minute for the 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 1.63 parts of CO per million parts of air ( ppm ) for the morning peak hour and 1.68 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 1.68 ppm with a peak one-hour emission rate of $1.31 \mathrm{grams} /$ minute ( $0.0218 \mathrm{grams} / \mathrm{second}$ ), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

The peak one-hour CO emission rate for the Phase III parking garage was calculated to be 5.27 grams per minute for the morning peak hour and 5.39 grams per minute for the 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 1.85 parts of CO per million parts of air ( ppm ) for the morning peak hour and 1.90 ppm for the afternoon peak hour. Therefore, the peak one-hour CO concentration inside the garage will be 1.90 ppm with a peak one-hour emission rate of 5.39 grams $/$ minute ( 0.0898 grams $/ \mathrm{second}$ ), corresponding to the afternoon peak period. These predictions represent conservative estimates of the peak garage CO emissions and concentrations.

## Peak Ambient CO Concentration

Worst-case concentrations of CO from the parking garage were predicted for locations around the building using AERMOD model (Version 13350) in screening-mode. The results of the air quality analysis for locations outside and around the building are summarized in Table 4.3-4. The results in Table 4.3-4 represent all outside locations on and near the Project Site, including nearby building air intakes and nearby residences. Appendix C contains the AERMOD model output.

The AERMOD model in screening-mode was used to predict the maximum concentration of CO by modeling each garage emissions as a point source with aerodynamic building downwash using worst-case meteorological conditions for an urban area. The screening-mode option simulates modeling results predicted by AERSCREEN. AERMOD was used to predict the total maximum concentration of CO by modeling the garage emissions as two point sources with the total peak morning CO emissions 0.0218 and 0.0898 grams/second for the Phase II and Phase III parking garages, respectively. The predicted concentrations presented here represent the worstcase air quality impacts from both garages at all locations on and around the Project. AERMOD predicted one-hour average concentrations of air pollutants.

AERMOD predicted that the maximum one-hour CO concentration from the garage exhausts will be $0.46 \mathrm{ppm}\left(526.6 \mu \mathrm{~g} / \mathrm{m}^{3}\right)$. 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, and 2) 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 $0.41 \mathrm{ppm}(0.46 \mathrm{ppm} \times 0.9)$.

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. Conservative, urban CO background values of 1.8 ppm for a one-hour period and 1.5 ppm for an eight-hour period were added to the maximum predicted garage ambient impacts to represent the CO contribution from other, more distant, sources. With the conservative background concentration added, the peak one-hour and eight-hour CO impacts from the garage, at any location around the building, will be no larger than 1.96 ppm and 2.21 ppm , respectively. These maximum predicted total CO concentrations (garage exhaust impacts plus background) are safely in compliance with the NAAQS. This analysis demonstrates that the operation of the parking garage will not have an adverse impact on air quality.

Table 4.3-4. Peak Predicted Parking Garages Air Quality Impacts

|  | Peak Predicted <br> One-Hour <br> Impact <br> $(p p m)$ | One-Hour <br> NAAQS <br> $(\mathrm{ppm})$ | Peak Predicted <br> Eight-Hour <br> Impact <br> $(p p m)$ | Eight-Hour <br> NAAQS <br> $(p p m)$ |
| :--- | :---: | :---: | :---: | :---: |
| Outside - Surrounding <br> the Building <br> (Parking Garages) | $1.96^{* *}$ | 35 <br> (NAAQS) | $2.21^{* *}$ | 9 <br> (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.
** Includes background concentrations of 1.8 ppm for the one-hour period and 1.5 ppm for the eight-hour period.


## Conclusions

A conservative air quality analysis demonstrates that there will be no adverse air quality impacts from the operation of the Project's proposed parking garages.

### 4.3.3 Microscale CO Analysis for Selected Intersections

The Boston Redevelopment Authority (BRA) and the Massachusetts DEP 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 Full Build 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 CO air quality analysis was performed to predict the maximum one-hour and eighthour CO concentrations for sensitive receptors at the three intersections in the Project area that meet the BRA selection criteria. The analysis was performed for three cases: 2014 Existing, 2019 No-Build, and 2019 Build. Estimation of CO levels at the intersections that meet the BRA/DEP selection criteria under the 2019 Build scenario provides a good indication of whether the project will interfere with the maintenance of the NAAQS for CO. Since CO levels are highest near intersections where the worst traffic congestion occurs, compliance with the NAAQS at these intersections and receptors protects public health elsewhere in the community.

## Dispersion Model

The latest version of the U.S. EPA CAL3QHC model ${ }^{2}$ (Version 2.0, dated October 1995) was used to predict maximum one-hour CO concentrations at each intersection from both moving and

[^2]idling vehicles. This model includes the U.S. EPA CALINE-3 dispersion model ${ }^{3}$ along with methods for estimating queue lengths and the contribution of emissions from idling vehicles at intersections. The Air Quality Appendix (Appendix C) contains the CAL3QHC model output.

## Meteorological Inputs

The following meteorological parameters were selected for the CAL3QHC modeling, in accordance with U.S. EPA and Massachusetts DEP guidance:

- Roughness Length: 321 cm (central business district)
- Mixing Height: 1,000 meters
- Wind Speed: $\quad 1.0 \mathrm{~m} / \mathrm{s}$ (minimum)
- Wind Direction: $360^{\circ}$ in $10^{\circ}$ increments
- Stability Class: Class D.


## Intersections

Five intersections were included in the transportation study area, and each of these intersections was considered for a microscale CO air quality analysis. Table 4.5-5 shows a summary of the 2019 Build LOS analysis for each intersection. The Project Full Build will generate a total of 150 motor vehicle trips during the morning peak traffic period and 154 motor vehicle trips during the afternoon peak traffic period. Based on data presented in Section (summarized in Table 4.4-4), two intersections meet the DEP/BRA criteria for a microscale analysis:

1. Tremont Street at Columbus Avenue/Malcolm X Boulevard
2. Tremont Street at Terrace Street/Gurney Street
3. Tremont Street/Parker Street
[^3]Table 4.4-4. Summary of Build Case Level of Service

| Intersection | Build LOS <br> (AM/PM) | Requires <br> Analysis? |
| :--- | :---: | :---: |
| Tremont Street/Prentiss Street - signalized | D/E | NO* |
| Tremont Street at Columbus Avenue/Malcolm X Blvd - signalized | F/F | YES |
| Tremont Street at Terrace Street/Gurney Street - signalized | F/F | YES |
| Tremont Street/Parker Street - signalized | F/F | YES |
| Parker Street/Station Street - unsignalized | B/B | 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: Howard/Stein-Hudson Associates, Inc.

## Receptors

Receptors are the locations where the CAL3QHC model predicts CO concentrations. Receptors were placed at regular intervals along each modeled roadway, where the public could have access. These receptors conservatively cover all of the locations where the general public may have frequent and prolonged access to the ambient air at each intersection. Figures 1 through 3 in the Appendix C show the locations of the receptors that were modeled at each of the three analyzed intersections. Following U.S. EPA guidance, all receptors were placed at a height of 1.8 meters and were located at least 3 meters from roadway curbsides.

## Modeled Roadways

Each roadway approach was modeled as a 1,000 meter, free-flow (moving vehicles), line source. The width of each free-flow link was set equal to the roadway width (excluding the parking areas) plus 3 meters on each side. Composite CO emission rates, in units of grams per mile, were applied to each free-flow link.

Each roadway approach with traffic signal control was also modeled as a queue link (vehicles waiting for a traffic signal to turn green). The width of each queue link was modeled as the actual approach lane width. The length of each queue was calculated by the CAL3QHC model. An idle CO emission factor, in grams per hour, was applied to each queue link.

The CAL3QHC model requires the input of signal timing for signalized intersections. All three of the intersections are signalized and were modeled as being signalized for all three cases. Signal timings were provided by Howard/Stein-Hudson Associates, Inc. and are shown in the Appendix D for the peak periods that were modeled.

## Eight-Hour Average CO Concentrations

Peak eight-hour CO concentrations from roadway traffic were calculated by multiplying the model predicted one-hour CO values (without an added background concentration) by a persistence factor of $0.7 .{ }^{4}$ The persistence factor takes into account that the intensity of the traffic during the peak eight-hour period will be less than that which will occur during the peak one-hour period. It also takes into account that the worst-case meteorological conditions (i.e. low wind speed blowing directly from the source to the receptor), corresponding to the peak one-hour concentrations, will not persist for an entire eight-hour period.

## Background CO Concentrations

The one-hour and eight-hour traffic-related CO concentrations predicted by the CAL3QHC model were added to conservative one-hour and eight-hour background CO concentrations of 2.5 parts of CO ppm and 1.8 ppm , respectively, for the existing case. Background concentrations for the year 2019 will likely be lower than the existing background CO concentrations. To be conservative, the same background concentrations were used for the 2019 No-Build and Build cases. The sums of the CAL3QHC modeled CO concentrations plus background were compared to the NAAQS for CO.

## CO Emission Factors

The MOBILE6.2 Emission Factor Model ${ }^{5}$ was used to predict the composite CO emission factors for moving (free flow) vehicles at the intersections and the idle emission factors for vehicles queued at traffic signals. Output from the MOBILE6.2 model is included in the Appendix D.

The input parameters used for the MOBILE6.2 models are consistent with those required by the latest Massachusetts DEP guidance dated February 12, 2003. This guidance allows credit to be taken for an enhanced I/M program with Massachusetts specific cutpoints, Stage II (refueling) emission controls, and reformulated gasoline.

Idle emission factors were calculated from the MOBILE6.2 emission factors for a speed of 2.5 mph, following U.S. EPA guidance. The idle emission factors for 2014 and 2019 were determined to be 41.95 and 37.77 grams/hour, respectively. MOBILE6.2 was used to predict the free flow emission rate for vehicles traveling on the roadways, conservatively using a vehicle speed of 25 mph for all of the modeled roadways. The free flow CO emission rates for a traffic speed of 25 mph were predicted to be 9.62 grams $/ \mathrm{mile}$ in 2014 and $8.80 \mathrm{grams} / \mathrm{mile}$ in 2019.

[^4]
## Traffic Information

Traffic volume data were available for the peak weekday morning and afternoon periods. Traffic data for the period with the worst LOS (i.e. largest traffic congestion and vehicle delays) at each intersection were modeled to reflect the potential worst-case air quality impacts.

## Predicted Project Impacts

The microscale air quality analysis predicted maximum one-hour and eight-hour CO concentrations for sensitive receptors for three intersections in the project area which meet the BRA/DEP selection criteria. The highest predicted CO concentrations for the one-hour and eighthour periods, which consist of the sum of the maximum predicted impacts from intersection traffic and a conservative background CO concentration, are summarized in Tables 4.4-5 and 4.46. The results in these tables do not represent typical air pollution levels in the project area. Rather, they represent the highest concentrations that could exist during the joint occurrence of worst-case meteorology and peak roadway traffic.

2014 Existing Case: The maximum predicted one-hour and eight-hour CO concentrations, including conservative background concentrations of CO, for the 2014 Existing case are 5.3 ppm and 3.8 ppm , respectively. These maximum air quality impacts are predicted to occur at receptor \#8 to the southeast of the intersection of Tremont Street at Columbus Avenue/Malcolm X Boulevard (see the Figure in the Appendix C), and are in compliance with the NAAQS for CO.

2019 No-Build Case: For the 2019 No-Build case, the maximum predicted one-hour and eighthour CO concentrations, including conservative background concentrations of CO, are 5.2 ppm and 3.7 ppm , respectively. These maximum air quality impacts are predicted to occur at receptor \#8 to the southeast of the intersection of Tremont Street at Columbus Avenue/Malcolm X Boulevard (see the Figure in the Appendix C), and are in compliance with the NAAQS for CO.

2019 Build Case: For the 2019 Build case, the maximum predicted one-hour and eight-hour CO concentrations, including conservative background concentrations of CO, are 5.2 ppm and 3.7 ppm, respectively. These maximum concentrations are less than those predicted for the 2014 Existing case and the same as 2019 No-Build case. The predicted CO impacts at all receptors are safely in compliance with the one-hour and eight-hour NAAQS for CO. These maximum air quality impacts are also predicted to occur at receptor \#8 on the southeast of the intersection of Tremont Street at Columbus Avenue/Malcolm X Boulevard (see the Figure in the Appendix C). These results demonstrate that the project will not have an adverse impact on air quality at the most congested intersections in the project area.

## Table 4.4-5. Maximum Predicted One-Hour CO Concentrations at Sensitive Receptors (ppm)

| Intersection | $\mathbf{2 0 1 4}$ <br> Existing | $\mathbf{2 0 1 9}$ <br> No-Build | $\mathbf{2 0 1 9}$ <br> Build |
| :--- | :---: | :---: | :---: |
| Tremont Street at Columbus <br> Avenue/Malcolm X Boulevard | 5.3 | 5.2 | 5.2 |
| Tremont Street at Terrace <br> Street/Gurney Street | 3.2 | 3.2 | 3.2 |
| Tremont Street/Parker Street | 3.4 | 3.4 | 3.4 |
| NAAQS | $\mathbf{3 5}$ | 35 | 35 |

Note: Maximum predicted one-hour concentrations include background concentrations.
The added one-hour average background CO concentration is 2.5 ppm in 2014 and 2019.

Table 4.4-6. Maximum Predicted Eight-Hour CO Concentrations at Sensitive Receptors (ppm)

| Intersection | $\mathbf{2 0 1 4}$ <br> Existing | $\mathbf{2 0 1 9}$ <br> No-Build | $\mathbf{2 0 1 9}$ <br> Build |
| :--- | :---: | :---: | :---: |
| Tremont Street at Columbus <br> Avenue/Malcolm X Boulevard | 3.8 | 3.7 | 3.7 |
| Tremont Street at Terrace <br> Street/Gurney Street | 2.3 | 2.3 | 2.3 |
| Tremont Street/Parker Street | 2.4 | 2.4 | 2.4 |
| NAAQS | $\mathbf{9}$ | $\mathbf{9}$ | $\mathbf{9}$ |

Note: Maximum predicted eight-hour concentrations include background concentrations. The added eight-hour average background CO concentration is 1.8 ppm in 2014 and 2019.

The maximum predicted CO impacts for the 2019 No-Build and Build cases are less than those predicted for the 2014 Existing Case. This is a result of the lower CO emission rates for motor vehicles predicted by the MOBILE6.2 model for 2019, compared to 2014. The reduction in motor vehicle CO emission rates is primarily a result of the improved motor vehicle emission controls, and occurs as newer vehicles with lower CO emissions replace older vehicles on the road. The maximum predicted CO impacts for the 2019 Build case is the same as those predicted for the 2019 No-Build Case due to proposed Travel Demand Management (TDM) measures presented in Section 7.0. The results show that the project will not have a significant impact on the air quality at the analyzed intersections.

The worst-case air quality impacts at the Project site can be conservatively represented by the highest predicted CO concentration at the intersection of Tremont Street at Columbus Avenue/Malcolm X Boulevard, which is adjacent to the Project site. Adding in the impacts from the parking garages and background concentration, the conservative estimate of the worst-case total one-hour and eight-hour CO impacts at the Project site will be 5.7 ppm and 4.1 ppm , respectively. These values are safely in compliance with the NAAQS for CO and indicate that the Project will not have an adverse impact on local air quality.

## Conclusions

The microscale CO air quality dispersion modeling analysis clearly indicates that the worst-case traffic generated by the Parcel 25 project will not cause or contribute to any violations of the NAAQS for CO, and will not significantly affect air quality. Total CO impacts at the intersections with the largest delays and at the Project site, including the impacts from the parking garages, are predicted to be safely in compliance with the NAAQS for CO.

### 4.4 Noise Impacts

Tech Environmental, Inc., performed a noise study to determine whether the operation of the proposed Parcel 25 project will comply with the City of Boston Noise Regulations and the Massachusetts Department of Environmental Protection ("DEP") Noise Policy.

### 4.4.1 Common Measures of Community Noise

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 4.4-1 gives the perceived change in loudness of different changes in sound pressure levels. ${ }^{6}$

Table 4.4-1. 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 |

[^5]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 $\mathrm{L}_{90}$ metric, which is the sound level exceeded 90 percent of the time, is typically used. The $\mathrm{L}_{90}$ can also be thought of as the level representing the quietest 10 percent of any time period. Similarly, the $\mathrm{L}_{10}$ can also be thought of as the level representing the quietest 90 percent of any time period. The $\mathrm{L}_{10}$ and $\mathrm{L}_{90}$ are broadband sound pressure measures, i.e., they include sounds at all frequencies.

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 pressure waves, and typically the frequency analysis examines nine octave bands from 32 Hz to $8,000 \mathrm{~Hz}$. A source is said to create a pure tone if acoustic energy is concentrated in a narrow frequency range and one octave band has a sound level 3 dB greater than both adjacent octave bands.

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 4.4-2.

### 4.4.2 Noise Regulations

## Commonwealth Noise Policy

The DEP 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 DEP DAQC Policy Statement 90-001 (February 1, 1990) interprets a violation of this noise regulation to have occurred if the noise source causes either:

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

The ambient background level is defined as the $\mathrm{L}_{90}$ 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 DEP 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, east, and south. The Project must comply with Regulation 2.2 for noise levels in Residential Zoning Districts at these residential locations. Table 4.4-3 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.

Table 4.4-2. Common Indoor and Outdoor Sound Levels

| Outdoor Sound Levels | Sound Pressure ( $\mu \mathrm{Pa}$ ) | 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: $\mu \mathrm{Pa}$, or micro-Pascals, describes sound pressure levels (force/area). DBA, or A-weighted decibels, describes sound pressure on a logarithmic scale with respect to $20 \mu \mathrm{~Pa}$ (reference pressure level).

Table 4.4-3. Maximum Allowable Sound Pressure Levels (dB) City of Boston

| Octave Band (Hz) | $\begin{array}{c}\text { Zoning District } \\ \text { Residential } \\ \text { (All Other Times) }\end{array}$ |  |  |
| :---: | :---: | :---: | :---: | \(\left.\begin{array}{c}Business <br>

(anytime)\end{array}\right]\)

### 4.4.3 Pre-Construction Sound Level Measurements

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 11:00 p.m. and 4:00 a.m. was selected as the worst-case time period, i.e., the time period when Projectrelated sounds may be most noticeable due to the quieter background sound levels. Establishing an existing background ( $\mathrm{L}_{90}$ ) during the quietest hours of the facility operation is a conservative approach for noise impact assessment and is required by the DEP Noise Policy.

The nighttime noise measurement locations are as follows (see the Figure 1 in the Appendix D):

## Monitoring Location \#1: Corner of Gurney Street and Tremont Street <br> Monitoring Location \#2: Corner of Smith Street and Parker Street

Broadband (dBA) and octave band sound level measurements were made with a Bruel and Kjaer Model 2250 environmental sound level analyzer, at each monitoring location, for a duration of approximately twenty 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 $\mathrm{L}_{90}$, which is used to set the ambient background sound level.

The B\&K model 2250 is equipped with a $1 / 2^{\prime \prime}$ precision condenser microphone and has an operating range of 5 dB to 140 dB and an overall frequency range of 3.5 Hz to $20,000 \mathrm{~Hz}$. 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 B\&K 2250 was tripod mounted at approximately five feet above the ground in open areas away from vertical reflecting surfaces.

The nighttime sound level monitoring was conducted on Thursday, May 8 and Friday May 9, 2014. Weather conditions during the sound survey were conducive to accurate sound level monitoring: the temperature was $60^{\circ} \mathrm{F}$, the skies were mostly cloudy, and the winds were 0 to 5 mph . The microphone of the sound level analyzer was fitted with a 7 -inch windscreen to negate any effects of wind-generated noise.

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

The results of the nighttime baseline sound level measurements are presented in Table 4.4-4, and the complete measurement printouts are provided in Appendix D. The nighttime background $\mathrm{L}_{90}$ level was 55.6 dBA at Location \#1 and 45.6 dBA at Location \#2. The octave band data in Table 4.4-4 show that no pure tones were detected in the nighttime noise measurements.

Table 4.4-4. Nighttime Baseline Sound Level Measurements, May 8 \& 9, 2014

| Sound Level | (Location \#1) <br>  <br> Tremont Streets <br> 11:08 p.m. - 11:38 p.m. | (Location \#2) <br>  <br> Parker Streets |
| :--- | :---: | :---: |
| 11:46 p.m. - 12:16 a.m. |  |  |$|$| Broadband (dBA) |
| :--- |
| Background (L. $\mathrm{L}_{90}$ ) |

### 4.4.4 Reference Data and Candidate Mitigation Measures

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 mechanical equipment:

- (3) Cooling Towers
- (3) Chillers
- (8) Rooftop air handling units
- (2) EHRUs
- $1,000 \mathrm{~kW}$ rooftop emergency generator

The equipment listed above, which will be located on four separate 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 Massachusetts DEP noise regulations.

The proposed project will have one $1,000-\mathrm{kW}$ standby generator. This unit will include a critical silencer (muffler) to mitigate exhaust noise, and will be located in a sound attenuating enclosure,
as necessary, to reduce mechanical noise at ground level adjacent to the kitchen area. The standby generator will be operated only when electrical service to the building is interrupted and periodically for brief periods for testing purposes. The standby generator will be tested for the minimum acceptable amount designated by the manufacturer; and will only be tested during daytime periods. To be conservative, the emergency generator was included in the sound level impact analysis. Final standby generator equipment will be selected and designed to assure compliance with all applicable 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 DEP 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 DEP 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.

To minimize the sound level at nearby residences, the following noise mitigation specifications will be incorporated into the final engineering design of the Project, as necessary, to comply with the applicable sound level criteria:

- Specification of low-noise mechanical equipment and silencers: The ERU and RTUs will be of a low-noise design. The standby generator will be enclosed in an acoustic enclosure and equipped with a critical exhaust silencer for sound reduction.
- Acoustical shielding: Most of the rooftop equipment will be housed in either a fully enclosed penthouse or four-sided walls to reduce the mechanical noise impacts.
- Operational restrictions: The standby generator will only be operated when electrical service to the buildings is interrupted and for occasional brief daytime periods for the minimum acceptable amount of testing designated by the manufacturer.


### 4.4.5 Calculated Future Sound Levels

## 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. ${ }^{7}$ The model is based on ISO 9613, an internationally 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.

## Receptors

The closest/worst-case sensitive (residential) location is to the southeast of the project area at 673 Parker Street. 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 building's mechanical equipment were predicted at the closest residential locations on Tremont Street and Parker Street. Figure 1 in Appendix D shows the locations of the modeled noise receptors. Noise impacts at other nearby noise-sensitive locations (residences, parks, etc.) farther from the Project Site will be less than those predicted for these receptors.

### 4.4.6 Compliance with State and Local Noise Standards

The City of Boston and DEP noise standards apply to the operation of the mechanical equipment at the proposed Project. The details of the noise predictions are presented in Tables 4.4-6 through 4.4-14. 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.

## City of Boston Noise Standards

The noise impact analysis results, presented in Tables 4.4-6 through 4.4-14, reveal that the sound level impact at the worst-case property line and the closest noise-sensitive receptors will be between 37.9 and 45.9 dBA . The smallest sound level impact of 37.9 dBA is predicted to occur at the Children's Learning Center Daycare (Location R1). The largest sound level impact of 45.9 dBA is predicted to occur at the closest residence at 673 Parker Street, $3{ }^{\text {rd }}$ Floor (Location R7). Noise impacts predicted at all locations are in compliance with the City of Boston's nighttime

[^6]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 4.4-3). The Project will also easily comply with the City of Boston business area noise limits at all surrounding commercial properties.

## Massachusetts DEP Noise Regulations

The predicted sound level impacts at the worst-case property line and the worst-case residential locations were added to the measured $L_{90}$ value of the quietest daily hour to test compliance with DEP'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 5:00 a.m.

The predicted sound level impacts at the worst-case property line and the closest residences were added to the $\mathrm{L}_{90}$ values measured during the period with the least amount of background noise to test compliance with DEP's noise criteria. The predicted noise impacts at the property line and the closest residences were added to the most-representative measured $\mathrm{L}_{90}$ values to determine the largest possible increase in the sound level at each location during the quietest hour at the Project Site.

As shown in Tables 4.4-6 through 4.4-14, the Project is predicted to produce 3 dBA or less change in the background sound levels at all modeled locations. Therefore, the Project's worstcase sound level impacts during the quietest nighttime periods will be in compliance with the Massachusetts DEP 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.

Table 4.4-6. Estimated Future Sound Level Impacts - Anytime, 1424 Tremont Street, Children's Learning Center - Location R1

| Octave Bands | Residential <br> Nighttime | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 52 |
| 63 Hz | 67 | 52 |
| 125 Hz | 61 | 47 |
| 250 Hz | 52 | 42 |
| 500 Hz | 46 | 34 |
| 1000 Hz | 40 | 30 |
| 2000 Hz | 33 | 22 |
| 4000 Hz | 28 | 17 |
| 8000 Hz | 26 | 7 |
| Broadband (dBA) | 50 | 38 |
| Compliance with the City of Boston Noise Regulation? |  | Yes |


| Sound Level Metric | Maximum Sound Levels <br> $(\mathrm{dBA})$ |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 1) | 55.6 |
| Parcel 25 Project* | 37.9 |
| Calculated Combined Future Sound Level | 55.7 |
| Calculated Incremental Increase | +0.1 |
| Compliance with DEP Noise Policy? | Yes |

* Assumes full-load operation of all mechanical equipment.
Note: DEP Policy allows a sound level increase of up to 10 dBA

Table 4.4-7. Estimated Future Sound Level Impacts - Anytime, 1430 Tremont Street, First Floor - Location R2

| Octave Bands | Residential <br> Nighttime | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 52 |
| 63 Hz | 67 | 52 |
| 125 Hz | 61 | 47 |
| 250 Hz | 52 | 43 |
| 500 Hz | 46 | 35 |
| 1000 Hz | 40 | 30 |
| 2000 Hz | 33 | 22 |
| 4000 Hz | 28 | 15 |
| 8000 Hz | 26 | 3 |
| Broadband (dBA) | $\mathbf{5 0}$ | $\mathbf{3 8}$ |
| Compliance with the City of Boston Noise Regulation? |  | Yes |


| Sound Level Metric | Maximum Sound <br> Levels* $^{*}$ (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L ${ }_{90}$ (Location \# 1) | 55.6 |
| Parcel 25 Project* | 38.3 |
| Calculated Combined Future Sound Level | 55.7 |
| Calculated Incremental Increase | +0.1 |
| Compliance with DEP Noise Policy? | Yes |

[^7]Table 4.4-8. Estimated Future Sound Level Impacts - Anytime, 1430 Tremont Street, Third Floor - Location R3

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 53 |
| 63 Hz | 67 | 53 |
| 125 Hz | 61 | 49 |
| 250 Hz | 52 | 46 |
| 500 Hz | 46 | 38 |
| 1000 Hz | 40 | 33 |
| 2000 Hz | 33 | 27 |
| 4000 Hz | 28 | 18 |
| 8000 Hz | 26 | 5 |
| Broadband (dBA) | 50 | 41 |
| Compliance with the City of Boston Noise Regulation? |  | Yes |
|  |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 1) | 55.6 |
| Parcel 25 Project* | 41.3 |
| Calculated Combined Future Sound Level | 55.8 |
| Calculated Incremental Increase | +0.2 |
| Compliance with DEP Noise Policy? | Yes |

[^8]Table 4.4-9. Estimated Future Sound Level Impacts - Anytime, 1431 Tremont Street, First Floor - Location R4

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 53 |
| 63 Hz | 67 | 53 |
| 125 Hz | 61 | 49 |
| 250 Hz | 52 | 46 |
| 500 Hz | 46 | 38 |
| 1000 Hz | 40 | 33 |
| 2000 Hz | 33 | 26 |
| 4000 Hz | 28 | 8 |
| 8000 Hz | 26 | 41 |
| Broadband (dBA) | 50 | Yes |
| Compliance with the City of Boston Noise Regulation? |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 1) | 55.6 |
| Parcel 25 Project* | 41.2 |
| Calculated Combined Future Sound Level | 55.8 |
| Calculated Incremental Increase | +0.2 |
| Compliance with DEP Noise Policy? | Yes |

[^9]Table 4.4-10. Estimated Future Sound Level Impacts - Anytime, 1431 Tremont Street, Third Floor - Location R5

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 54 |
| 63 Hz | 67 | 55 |
| 125 Hz | 61 | 51 |
| 250 Hz | 52 | 49 |
| 500 Hz | 46 | 42 |
| 1000 Hz | 40 | 37 |
| 2000 Hz | 33 | 33 |
| 4000 Hz | 28 | 26 |
| 8000 Hz | 26 | 14 |
| Broadband (dBA) | 50 | 45 |
| Compliance with the City of Boston Noise Regulation? |  | Yes |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 1) | 55.6 |
| Parcel 25 Project* | 44.6 |
| Calculated Combined Future Sound Level | 55.9 |
| Calculated Incremental Increase | +0.3 |
| Compliance with DEP Noise Policy? | Yes |

[^10]Table 4.4-11. Estimated Future Sound Level Impacts - Anytime, 673 Parker Street, First Floor - Location R6

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 51 |
| 63 Hz | 67 | 52 |
| 125 Hz | 61 | 49 |
| 250 Hz | 52 | 47 |
| 500 Hz | 46 | 40 |
| 1000 Hz | 40 | 35 |
| 2000 Hz | 33 | 28 |
| 4000 Hz | 28 | 3 |
| 8000 Hz | 26 | 43 |
| Broadband (dBA) | 50 | Yes |
| Compliance with the City of Boston Noise Regulation? |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 2) | 45.6 |
| Parcel 25 Project* | 42.7 |
| Calculated Combined Future Sound Level | 47.4 |
| Calculated Incremental Increase | +1.8 |
| Compliance with DEP Noise Policy? | Yes |

[^11]Table 4.4-12. Estimated Future Sound Level Impacts - Anytime, 673 Parker Street, Third Floor - Location R7

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 52 |
| 63 Hz | 67 | 53 |
| 125 Hz | 61 | 51 |
| 250 Hz | 52 | 50 |
| 500 Hz | 46 | 44 |
| 1000 Hz | 40 | 40 |
| 2000 Hz | 33 | 32 |
| 4000 Hz | 28 | 10 |
| 8000 Hz | 26 | 46 |
| Broadband (dBA) | 50 | Yes |
| Compliance with the City of Boston Noise Regulation? |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 2) | 45.6 |
| Parcel 25 Project* | 45.9 |
| Calculated Combined Future Sound Level | 48.8 |
| Calculated Incremental Increase | +3.2 |
| Compliance with DEP Noise Policy? | Yes |

[^12]Table 4.4-13. Estimated Future Sound Level Impacts - Anytime, 675 Parker Street, First Floor - Location R8

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 51 |
| 63 Hz | 67 | 53 |
| 125 Hz | 61 | 50 |
| 250 Hz | 52 | 48 |
| 500 Hz | 46 | 41 |
| 1000 Hz | 40 | 36 |
| 2000 Hz | 33 | 30 |
| 4000 Hz | 28 | 7 |
| 8000 Hz | 26 | 44 |
| Broadband (dBA) | 50 | Yes |
| Compliance with the City of Boston Noise Regulation? |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 2) | 45.6 |
| Parcel 25 Project* | 43.7 |
| Calculated Combined Future Sound Level | 47.8 |
| Calculated Incremental Increase | +2.2 |
| Compliance with DEP Noise Policy? | Yes |

[^13]Table 4.4-14. Estimated Future Sound Level Impacts - Anytime, 675 Parker Street, Third Floor - Location R9

| Octave Bands | Residential <br> Nighttime <br> Noise Standards | Maximum Predicted <br> Sound Levels* |
| :---: | :---: | :---: |
| 32 Hz | 68 | 52 |
| 63 Hz | 67 | 53 |
| 125 Hz | 61 | 51 |
| 250 Hz | 52 | 49 |
| 500 Hz | 46 | 44 |
| 1000 Hz | 40 | 39 |
| 2000 Hz | 33 | 32 |
| 4000 Hz | 28 | 10 |
| 8000 Hz | 26 | 46 |
| Broadband (dBA) | 50 | Yes |
| Compliance with the City of Boston Noise Regulation? |  |  |


| Sound Level Metric | Maximum Sound <br> Levels* (dBA) |
| :--- | :---: |
| Existing Nighttime Background, L90 (Location \# 2) | 45.7 |
| Parcel 25 Project* | 45.6 |
| Calculated Combined Future Sound Level | 48.7 |
| Calculated Incremental Increase | +3.0 |
| Compliance with DEP Noise Policy? | Yes |

[^14]
### 4.4.7 Conclusions

Sound levels at all nearby sensitive locations and at all property lines will fully comply with the most stringent City of Boston and DEP daytime and nighttime sound level limits.

This acoustic analysis demonstrates that the Project's design will meet the applicable acoustic criteria.

### 4.5 Stormwater Management and Water Quality

The Project will improve the quality of stormwater leaving this site. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales and/or crushed stone, to provide for sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

The project will promote stormwater recharge to groundwater. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged as prescribed in BWSC's Site Plan Requirements. Stormwater runoff from vehicular areas will be treated through the use of deep sump catch basins and water quality treatment structures. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

The project will meet the Department of Environmental Protection's (DEP) Stormwater Management Standards for redevelopment. All necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Project will be in compliance with local and state stormwater management policies.

### 4.6 Solid and Hazardous Waste Materials

### 4.6.1 Solid Waste

During the preparation of the Site, debris, including asphalt, trash, and demolition debris will be removed from the Project Site. The Proponent will ensure that waste removal and disposal during construction and operation will be in conformance with the City and DEP's Regulations for Solid Waste.

Upon completion of construction, Phase I will generate approximately 161 tons of solid waste per year, based on the assumption that each residential unit generates 8 lbs of solid waste per day, office use generates $.01 \mathrm{lb} / \mathrm{sf} / \mathrm{day}$, and retail uses generate $.02 \mathrm{lb} / \mathrm{sf} / \mathrm{day}$ - translating to approximately 58.4 tons / year for the residential units, approximately 55 tons / year for the office uses, including community and training spaces, and approximately 40 tons / year for the retail.

Residential waste will be handled through a trash chute extending to all floors, and then compacted before being brought to the loading / unloading area behind building 1 B . Waste from the office and retail components will be brought directly to the loading area by their respective staffs.

The project will also include ambitious goals for construction waste management in order to meet the requirements for the $\mathrm{LEED}^{\mathrm{TM}}$ rating system. This strategy will divert demolition and construction waste by reusing and recycling materials.

In order to meet the requirements for the Boston Environmental Department and the LEED ${ }^{\text {TM }}$ rating system, the Project will include space dedicated to the storage and collection of recyclables, including dedicated dumpsters at the loading area. The recycling program will meet or exceed the City's guidelines, and provide-areas for waste paper and newspaper, metal, glass, and plastics (21 through 27, co-mingled).

### 4.6.2 Hazardous Waste and Materials

Based on information provided by Woodard and Curran, Parcel 25's hazardous waste consultants, the project site is associated with two reported releases of oil and/or hazardous material (OHM), which were assigned Release Tracking Numbers (RTN) 3-2624 and 3-31170 by the Massachusetts Department of Environmental Protection (MassDEP). Summaries of these two conditions are presented in the following paragraphs and the public records are available for online review by entering each RTN at: http://public.dep.state.ma.us/SearchableSites/Search.asp. In addition, activities related to recent release of fluids at the property from work conducted at an adjacent pump station operated by the Massachusetts Bay Transportation Authority (MBTA) are also summarized below.

RTN 3-2624: Environmental investigation activities conducted in the late 1980s resulted in the property's identification as a Location to be Investigated (LTBI) on the 1990 Transition List, due to the detection of low concentrations of total petroleum hydrocarbons in groundwater samples collected from on-site monitoring wells. As a result, RTN 3-2624 was assigned. In 1996, per the transition provisions of the applicable regulations in effect at the time, typically referred to as the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000), a Licensed Site Professional (LSP) Evaluation Opinion was prepared that concluded constituents previously detected had either biodegraded or dissipated into groundwater and that "No Further Action" related to RTN 3-2624 was required.

RTN 3-31170: Haley \& Aldrich prepared a Preliminary Soil Management Report for the property in October 2008. A copy of this report is available on request. Based the information and data contained within that report, on October 19, 2012, the project proponent, having recently acquired the property, notified the MassDEP of the presence of certain semivolatile organic compounds (SVOC) and heavy metals (i.e., lead and cadmium) in soils at the property above the
reportable concentrations for category S-1 soils (RCS-1). MassDEP assigned RTN 3-31170 to this 120 -day reporting condition.

On October 18, 2013, the project proponent submitted a Tier Classification, supported by a Phase I Initial Site Investigation Report to the MassDEP, classifying the disposal site as Tier II (the least complex/severe disposal site classification). The primary basis for this classification was the historic information and data collected by others at the property, including information and data documented by Haley \& Aldrich in their 2008 report. A copy of the Tier Classification submittal is available on request. No additional environmental site information or data have been collected in relation to RTN 3-31170 since submittal of the Tier Classification.

Per recent amendments to the MCP (effective June 20, 2014), unless a Permanent Solution has been submitted:

1. A Phase II Comprehensive Site Assessment (CSA) is due to the MassDEP by October 18, 2016 (i.e., 3 years from the date of Tier Classification);
2. A Phase III Remedial Action Plan (RAP) and Phase IV Remedy Implementation Plan are due to MassDEP by October 18, 2017 (i.e., 4 years from the date of Tier Classification); and
3. A Temporary Solution, Permanent Solution, or Remedy Operation Status, is due by October 18, 2018 (i.e., 5 years from the date of Tier Classification).

MBTA Pump Station: In addition to the release conditions related to RTN 3-2654 and 3-31170, the MBTA conducted work on a storm water pump station located adjacent to the property in 2013. During this work a release of fluids containing OHM, primarily metals and SVOCs, were released onto the property by MBTA's contractor. The release resulted in sediment deposition on soils along the southerly portion of the property, but did not result in a new release notification under the MCP. Clean Harbors Environmental Services, Inc. (CHES) completed cleanup of this release on behalf of MBTA. As part of the cleanup activities, additional samples of soil were collected from the base of the excavation and from areas outside the excavation area (i.e., background locations). These samples demonstrated that the CHES work was successful in removing soils potentially impacted by the MBTA release. A copy of CHES report related to these activities is available on request.

As discussed previously, Haley \& Aldrich, on behalf of the Proponent performed soil precharacterization to evaluate potential off-site disposal options for excess soils generated during proposed construction activities and documented their finding in a report dated October 2008. It is anticipated that excess soils generated during the planned mixed-use development of the property will be managed as a remedial response action in accordance with the MCP. It is anticipated that additional characterization of subsurface environmental conditions, and preparation of a focused risk characterization in support of the intended future uses of the property, may be required. The project proponent has retained Peter E. Nangeroni, P.E., LSP of Woodard \& Curran, Inc. to provide Licensed Site Professional support services during property redevelopment activities to both maintain compliance with the MCP and to assist with planning and attaining site closure under the MCP.

### 4.7 Geotechnical/Groundwater Impacts Analysis

It is anticipated that there will be little or no impact to the groundwater table due to the Proposed Project. While the Phase I Project does involve removal of fill for foundations and grade beams, the buildings constructed in Phase I are expected to be slab on-grade with very little subsurface work required, and no work below the water table. For later phases, there will be excavation for underground parking including ledge removal. Dewatering will be required inside the excavation to remove groundwater and surface water runoff or rainwater during construction.

The proposed construction is not anticipated to have adverse effects on long-term groundwater levels because the lowest floor level in the fill areas is above the groundwater level and all levels in future phases that will be below the water table will be deep into ledge and not adjacent to pathways for groundwater movement. Roof drains and runoff from impermeable outdoor surfaces will be led to infiltration devices where there is sufficient capacity for percolation. In ledge areas, the drains will lead to detention cisterns of the required size and released gradually into storm drains. Where practical, pervious paving will be used in outdoor hardscape areas.

Any groundwater removed from the excavation will be discharged under a NPDES general or exclusion permit. Construction mitigation measures will be incorporated into the Project to avoid the potential for ground movement and settlement during excavation, and potential impacts on, utility lines and the roadways.

### 4.8 Construction Impact

The following section describes impacts likely to result from the construction of the Parcel 25 Project and the steps that will be taken to avoid or minimize environmental and transportation-related impacts. Construction methodologies and scheduling will aim to minimize impacts on the surrounding environment. The Proponent will insure that the general contractors will be responsible for developing construction phasing and staging plans and for coordinating construction activities with all appropriate regulatory agencies. The Project's geotechnical consultant will also provide consulting services associated with foundation design recommendations, prepare geotechnical specifications, and review the construction contractor's proposed procedures.

### 4.8.1 Construction Management Plan

The Proponent will comply with applicable state and local regulations governing construction of the Project. The Proponent will insure that general contractors comply with the Construction Management Plan, ("CMP") developed in consultation with and approved by the Boston Transportation Department ("BTD"), prior to the commencement of construction. The CMPs will establish the guidelines for the duration of the Project phases and will include specific mitigation measures and staging plans to minimize impacts on abutters.

Construction methodologies that will ensure safety will be employed, signage will include General Contractor contact information with emergency contact numbers.

### 4.8.2 Proposed Construction Program

## Construction Activity Schedule

The construction period for the proposed Phase 1 Project is expected to last approximately 12 months, beginning in the 4th Quarter 2015 and reaching completion in the 4th Quarter 2016. The City of Boston Noise and Work Ordinances will dictate the normal work hours, which will be from 7:00 AM to 6:00 PM, Monday through Friday. Saturday work will be only in the event of schedule delay or unusual tasks such as street openings, etc.

Construction activity schedules for the next project phases will be developed as the Phase I project nears completion.

## Perimeter Protection/Public Safety

The CMP will describe any necessary sidewalk closures, pedestrian re-routings, and barrier placements and/or fencing deemed necessary to ensure safety around the Site perimeter. When possible, the sidewalk will remain open to pedestrian traffic during the construction period. Barricades and secure fencing will be used to isolate construction areas from pedestrian traffic. In addition, sidewalk areas and walkways near construction activities will be well marked to ensure pedestrian safety.

Proper signage will be placed at every corner of the Proposed Project as well as those areas that may be confusing to pedestrians and automobile traffic.

The Proponent will continue to coordinate with all pertinent regulatory agencies and representatives of the surrounding neighborhoods to ensure they are informed of any changes in construction activities.

### 4.8.3 Construction Traffic Impacts

## Construction Vehicle Routes

Specific truck routes will be established with BTD through the CMPs. These established truck routes will prohibit truck travel on residential side streets. Construction contracts will include clauses restricting truck travel to BTD requirements. Maps showing approved truck routes will be provided to all suppliers, contractors, and subcontractors. It is anticipated that all deliveries will be via Tremont Street directly to the site, not passing through residential areas in Mission Hill.

## Construction Worker Parking

The number of workers required for construction of the Proposed Project will vary during the construction period and during each of the phases. However, it is anticipated that all construction workers will arrive and depart prior to peak traffic periods.

Limited parking in designated areas of the Project Site and lay-down area(s) will be allowed. Parking will be discouraged in the immediate neighborhood. Further, given the Proposed Project's close proximity to transit service (e.g., MBTA Orange Line, Green Line, as well as bus service) public transit use will be encouraged with the Proponent and general contractor working to ensure the construction workers are informed of the many public transportation options immediately adjacent to this area. Terms and conditions related to worker parking will be written into each subcontractor's contract. The general contractors will provide a weekly orientation with all new personnel to ensure enforcement of this policy.

## Pedestrian Traffic

The Site abuts sidewalks on three streets. Pedestrian traffic may be temporarily impacted in these areas. The general contractors will minimize the impact the construction of the proposed building will have on the adjacent sidewalks. The general contractors will implement plans that will clearly denote all traffic patterns. Safety measures such as jersey barriers, fencing, and signage will be used to direct pedestrian traffic around the construction site and to secure the work area.

### 4.8.4 Construction Environmental Impacts and Mitigation

## Construction Air Quality

Construction activities may generate fugitive dust, which will result in a localized increase of airborne particle levels. Fugitive dust emission from construction activities will depend on such factors as the properties of the emitting surface (e.g. moisture content), meteorological variables, and construction practices employed.

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

- Using wetting agents to control and suppress dust from construction debris;
- Ensuring that all trucks traveling to and from the Project Site will be fully covered;
- Removing construction debris regularly;
- Monitoring construction practices closely to ensure any emissions of dust are negligible;
- Cleaning streets and sidewalks to minimize dust and dirt accumulation;
- Monitoring construction activities by the job site superintendent; and
- Wheel-washing trucks before they leave the Project Site during the excavation phase.

Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and Boston Water and Sewer ("BWSC") storm drain systems. During construction, existing catch basins will be protected from sediments with filter fabric, silt sacks or hay bale filters.

## Construction Noise Impacts

To reduce the noise impacts of construction on the surrounding neighborhood, a number of noise mitigation measures will be included in the CMP. Some of the measures that may be taken to ensure a low level of noise emissions include:

- Initiating a proactive program for compliance to the City of Boston's noise limitation requirements;
- Scheduling of work during regular working hours as much as possible;
- Using mufflers on all equipment and ongoing maintenance of intake and exhaust mufflers;
- Muffling enclosures on continuously operating equipment, such as air compressors and power and welding generators;
- Scheduling construction activities so as to avoid the simultaneous operation of the noisiest construction activities;
- Turning off all idling equipment;
- Reminding truck drivers that trucks cannot idle more than five (5) minutes unless the engine is required for operational activity;
- Locating noisy equipment at locations that protect sensitive receptors and neighborhood homes through shielding or distance;
- Installing a site barricade as required;
- Identifying and maintaining truck routes to minimize traffic and noise throughout the project;
- Maintaining all equipment to have proper sound attenuation devices.


### 4.8.5 Rodent Control

The City of Boston enforces the requirements established under Massachusetts State Sanitary Code, Chapter 11, 105 CMR 410.550. This policy establishes that the elimination of rodents and ongoing rodent control is required for issuance of any building permits. Before and during construction, rodent control service visits will be made by a certified rodent control firm to monitor the situation.

### 4.8.6 Utility Protection During Construction

During construction, the City and the Commonwealth's infrastructure will be protected using sheeting and shoring, temporary relocations, and construction staging as required. The general 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 contractor will also be required to provide adequate notification to the utility owner/operator prior to any work commencing on their utility. Also, in the event a utility cannot be maintained in service during a switch-over to a temporary or permanent system, the general contractor will be required to coordinate the shutdown with the utility owners/operators and Project abutters to minimize impacts and inconveniences accordingly.

### 5.0 Historic Resources Component

This section describes the historic and archaeological resources within and adjacent to the Project site.

### 5.1 Historic Resources

The Proposed Project site is immediately adjacent to the Parker Hill/Mission Hill North Slope Area. The historic resources within one-quarter-mile radius of the Proposed Project are summarized in Table 5-1 below.

Table 5.1 Historic Resources in the Vicinity of the Project Site

| Key to <br> Historic Resources <br> Figure (Figure 5-1) | Historic Resource | Address |
| :---: | :---: | :---: |
| St |  |  |

State and National Register Listed Properties

| A | Mission Church Complex* | Tremont, St. Alphonsus and Smith <br> Streets |
| :---: | :--- | :--- |
| B | Roxbury Highlands Historic <br> District | Centre, Marcella, Washington and <br> New Dudley Streets |

Properties included in the Inventory of Historic and Archaeological Assets of the Commonwealth

| $\mathbf{1}$ | Parker Hill/Mission Hill North <br> Slope Area | Parker Street, Tremont Street, <br> Burney Street, Delle Avenue, <br> Alleghany Street, Terrace Place, <br> Terrace Street, Folsom Avenue, <br> Hillside Street |
| :---: | :--- | :--- |
| $\mathbf{2}$ | Tremont Street Area | $1500-1540$ (even only) Tremont <br> Street |
| $\mathbf{3}$ | Parker Hill Branch, Boston Public <br> Library | 1497 Tremont Street |

[^15]
### 5.1.1 Historic Resources Within the Project Site

The site is currently vacant.

### 5.1.2 Historic Resources Within the Vicinity of the Project Site

The Proposed Project is located diagonally across Tremont Street from an edge of the Parker Hill/Mission Hill North Slope Area, an area primarily characterized by residential development between 1845 and 1910. The Proposed Project is also located within $1 / 4$ mile of the Tremont Street Area and the Parker Hill Branch of the Boston Public Library. There are not expected to be any impacts to these properties with the proposed new construction. See Figure 5-1. Historic Resources.

The Proposed Project is also not expected to have effects on the Mission Church due to its distance from this resource. Properties within the Roxbury Highlands Historic District, which is not adjacent but within $1 / 4$ mile of the site and located behind the Roxbury Community College on uplands may have a view of the office building when Parcel 25's Phase III is completed.

### 5.1.3 Archaeological Resources

No known archaeological resources were located within the Project site during the review of Massachusetts Historic Commission files and MACRIS, therefore no impacts to archaeological resources are anticipated.

### 5.2 Potential Impacts

Potential impacts associated with the Project, including shadow and visual impacts are evaluated in this section.

### 5.2.1 Shadow Impacts

Even with the proposed height of Phase III extending to 160 feet, the Full Build Project's shadow impacts are not extensive. New shadow is generally limited to the streets surrounding the Site. Although late afternoon and evening shadows will extend in an easterly/northeasterly direction toward the southwest corridor and Columbus Avenue, most of these lots and areas are currently impacted by current shadow patterns from existing buildings. Overall, the Project's shadow impacts will be consistent with current patterns and will not adversely impact the Project Site and any historical resources in surrounding areas.


0
$=1 / 2$ mile radius
$\square=$ Inventory
$=1 / 4$ mile radius
= State and National Register

Figure 5-1. Historic Resources

### 5.2.2 Visual Impacts

The Parcel 25 Full Build intends to replace the existing vacant and blighted site with a new mixed use residential and office project above ground level retail and garage parking. The nearby south side of Tremont Street currently consists of three and four-story residential and mixed-use buildings and includes properties within the Tremont Street and Parker Hill / Mission Hill North Slope Areas. The proposed size, scale, massing, materials, and use of the Parcel 25 Project are compatible with nearby properties.

The existing vacant site interrupts the street façade along this section of Tremont Street. The Proposed Project will create a new visually compelling street facade and eliminate the visibility of an unsightly, vacant site from the Tremont Street Area and the Parker Hill / Mission Hill North Slope Area.

The Full Build project's massing and facades are articulated by setbacks, balconies, material changes and variations in fenestration. The façade articulation and building height of the Project are compatible with the architectural expression of surrounding areas.

As a result of careful study of the surrounding properties, the selective use of materials, and appropriate massing, the Full Build project is expected to be compatible with the setting, scale, proportions, and materials of the surrounding areas including the Parker Hill / Mission Hill North Slope Area, the Tremont Street Area, and the Roxbury Highlands Historic District on the eastern side of Columbus Avenue, south of the MBTA's Orange Line Ruggles Station.

### 6.0 Infrastructure Systems Component

This section outlines the existing utilities surrounding the Project site, the connections required to provide service to the Propose Project, and any impacts on the existing utility systems that may result from the construction of the Proposed Project and identifies mitigation measures to address these impacts. The following utility systems are discussed herein:

- Sewer
- Domestic Water
- Fire Protection
- Drainage
- Electricity
- Telecommunications and Cable
- Steam and Gas

A detailed infrastructure analysis will be performed when the Proposed Project proceeds into the Design Development Phase. The Project's team will coordinate with the appropriate utilities to address the capacity of the area utilities to provide services for the new building. A Boston Water and Sewer Commission (BWSC) Site Plan and General Service Application is required for the new water, sanitary sewer, and storm drain connections. In addition, a Storm Water Pollution Prevention Plan will be submitted specifying best management measures for protecting the BWSC drainage systems during construction.

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

The Proposed Project includes the development of four mixed-use buildings on a previously developed lot, which will be developed in three phases. The Project Site is located in Mission Hill and is bounded by Station Street to the north, Gurney Street to the west, Tremont Street to the south, and the Massachusetts Bay Transit Authority (MBTA) Orange Line tracks to the east. The existing infrastructure surrounding the site appears sufficient to service the needs of the Proposed Project.

### 6.1 Sanitary Sewer System

### 6.1.1 Existing Sewer System

The Boston Water and Sewer Commission ("BWSC") owns and maintains the sewer systems adjacent to the site (See Figure 6-1). There are existing BWSC sanitary sewer mains located in Tremont Street, Gurney Street, and Station Street. There is a 12 -inch BWSC sanitary sewer main in Gurney Street. There is a 24 -inch by 36 -inch BWSC sanitary sewer main in Tremont Street. There is also a 12 -inch BWSC sanitary sewer main in Station Street. Additionally, the MWRA

204-inch by 186-inch (17-feet by 15.5 feet) Stony Brook Combined Sewer flows through the Project site.

The 12 -inch sanitary sewer main in Gurney Street flows southerly to the 24 -inch by 36 -inch sanitary sewer main in Tremont Street. The 24 -inch by 36-inch sanitary sewer main which flows easterly, decreases to an 18 -inch sanitary sewer main where it crosses the railroad tracks, and flows to the 42-inch sanitary sewer main adjacent to the MBTA Orange Line. The 42-inch sanitary sewer main flows northerly along the MBTA Orange Line to Ruggles Street, which then flows to the 78-inch MWRA sewer main in Columbus Avenue. The 78-inch MWRA sewer main ultimately flows to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal. The MWRA 204-inch by 186-inch Stony Brook Combined Sewer enters the site from Tremont Street flowing northerly, where it bends west and exits the site flows westerly in Gurney Street. The 204-inch by 186-inch Stony Brook Combined Sewer continues flowing to the MWRA Deer Island Waste Water Treatment Plan for treatment and disposal, or during times of high flows, discharges to the Charles River. The existing site currently does not have any existing sanitary sewer connections.

### 6.1.2 Project-Generated Sewage Flow

The Project will generate an estimated 33,305 gallons per day (gpd) based on design sewer flows provided in 314 CMR 7.00-Sewer System Extension and Connection Permit Program as summarized in Table 6-1. The 314 CMR 07.00 sewage generation values are used to evaluate new sewage flows or an increase in flows to existing connections. Typical generation values are conservative values. The existing site is an empty lot with intermittent pavement and does not produce any sewage flows. Based on 314 CMR 07.00 for residential, retail, community and office space, the Proposed Project is expected to generate approximately 11,548 gallons per day (gpd) for Phase I, approximately 10,120 gpd for Phase II, and approximately 12,113 gpd for Phase III, a total of approximately $33,780 \mathrm{gpd}$.


Table 6-1. Projected Sanitary Sewer Flows, Parcel 25

| Use* | GSF | Size |  | 314 CMR Value (gpd/unit) | Estimated Maximum Daily Flow (gpd) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Phase I - Retail | 10,000 s.f. | 10,000 | s.f. | $50 \quad / 1,000$ s.f. | 500 |
| Phase I- Office | 35,000 s.f. | 35,000 | s.f. | $75 \quad / 1,000$ s.f. | 2,625 |
| Phase I - Community | 1,250 s.f. | 1,250 | s.f. | $50 \quad / 1,000$ s.f. | 63 |
| Phase I - Residential | 42,000 s.f. | 76 | bedrooms | 110 /bedroom | 8,360 |
|  |  |  |  | Phase I Total: | 11,548 |
|  |  |  |  |  |  |
| Phase II - Residential | 56,000 s.f. | 92 | bedrooms | 110 /bedroom | 10,120 |
|  |  |  |  | Phase II Total: | 10,120 |
|  |  |  |  |  |  |
| Phase III - Office | 161,500 s.f. | 161,500 | s.f. | $75 \quad / 1000$ s.f. | 12,113 |
|  |  |  |  | Phase III Total: | 12,113 |
|  |  |  | Prop | Sewer Flows (gpd): | 33,780 |

*Uses identified are preliminary and subject to change in the final plans.

### 6.1.3 Sanitary Sewage Connection

The Proponent will coordinate with the BWSC on the design and capacity of the proposed connections to the existing system. The Project is expected to generate an increase in wastewater flows of approximately $33,780 \mathrm{gpd}$. Approval for the increase in sanitary flow will come from the BWSC.

It is anticipated that the proposed building's sanitary services will connect to either the 12 -inch sanitary main in Gurney Street, the 24 -inch by 36 -inch sanitary sewer main in Tremont Street and/or the 12 -inch sanitary sewer main in Station Street.

The Proponent will submit a Site Plan to the BWSC for review and approval. The process will include a comprehensive design review of the proposed service connections, an assessment of Project demands and system capacity, and the establishment of service accounts.

### 6.1.4 Sewer System Mitigation

The adjacent roadway sewer systems in Tremont Street, Gurney Street, and Station Street and potential building service connections to the sewer system were analyzed to determine pipe capacity.

Table 6-2 indicates the hydraulic capacity of the 12-inch sanitary sewer in Gurney Street, the 24inch x 36 -inch sanitary sewer system in Tremont Street, and the 12 -inch sanitary sewer in Station

Street. The minimum hydraulic capacity is 1.43 million gallons per day (MGD) or 2.21 cubic feet per second (cfs) for the 12 -inch system in Gurney Street, 27.07 MGD or 41.88 cfs for the 24inch x 36 -inch system in Tremont Street, and 3.30 MGD or 5.10 cfs for the 12 -inch system in Station Street. Based on an average daily flow estimate for the Proposed Project of 33,305 GPD or 0.033 MGD ; and with a factor of safety of 10 (total estimate $=0.033 \mathrm{MGD} \times 10=0.33 \mathrm{MGD}$ ), no capacity problems are expected within the Gurney Street, Tremont Street, or Station Street sanitary sewer systems.

Table 6-2 Sewer Hydraulic Capacity Analysis


[^16]The environmental design goals for the Proposed Project include reducing wastewater volumes by incorporating efficient fixtures into the design. Low-flow faucets, aerated shower-heads, and dual-flush toilets are being considered to reduce water usage and sewer generation.

### 6.2 Water System

### 6.2.1 Existing Water Service

Water for the Project site will be provided by the BWSC. There are five water systems within the City which provide service to portions of the City based on ground surface elevation. The five systems are southern low (commonly known as low service), southern high (commonly known as high service), southern extra high, northern low, and northern high.

The water mains in the vicinity of the Project Site are owned and maintained by BWSC (see Figure 6-2). Existing BWSC water mains are located in Tremont Street, Gurney Street and Station Street. There is a 16 -inch Southern High water main in Tremont Street. There is an 8inch Southern Low water main in Gurney Street. There is also an 8 -inch Southern Low main in Station Street. The existing site currently does not have any existing water services.

The site is within the service radius of several hydrants. There is one hydrant (H144) to the south on Tremont Street. There is one hydrant (H162) to the west on Gurney Street. There is one hydrant (H164) to the north on Station Street. The Proponent will confirm that the hydrants are sufficient for the development and coordinate any proposed changes in locations with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

The BWSC record flow test data containing actual flow and pressure for hydrants within the vicinity of the site was requested by the Proponent. Hydrant flow data was not available for any hydrants located near the project site. As the design progresses, the Proponent will request hydrant flows be conducted by the BWSC adjacent to the site, as hydrant flow data should be less than a year old to be used as a design tool. The Proponent will confirm that the hydrants are sufficient for the development and coordinate any proposed changes in locations with BWSC and the Boston Fire Department (BFD) during the detailed design phase.

### 6.2.2 Anticipated Water Consumption

The Proposed Project's water demand estimate for domestic services is based on the Project's estimated sewage generation, described above. A conservative factor of 1.1 (10\%) is applied to the estimated average daily wastewater flows calculated with 314 CMR 07.00 values to account for consumption, system losses and other usages to estimate an average daily water demand. The Project's estimated domestic water demand is $37,158 \mathrm{gpd}$. A more detailed water use estimate, including estimates for irrigation and air conditioning make-up water, and meter sizing calculations will be submitted to BWSC as part of the Site Plan approval process.

New water services will be installed in accordance with the latest local, state, and federal codes and standards. Backflow preventers will be installed at both domestic and fire protection service connections. New meters will be installed with Meter Transmitter Units (MTU's) as part of the BWSC's Automatic Meter Reading (AMR) system.


### 6.2.3 Proposed Water Service

The domestic and fire protection water services for the Proposed Project will connect to the existing BWSC water mains in Tremont Street, Gurney Street, and/or Station. Street. The proposed Project's impacts to the existing water system will be reviewed as part of the BWSC's site plan review process.

The domestic and fire protection water service connections required for the Project will meet the applicable City and State codes and standards, including cross-connection backflow prevention. Compliance with the standards for the domestic water system service connection will be reviewed as part of BWSC's Site Plan Review Process. This review will include sizing of domestic water and fire protection services, calculation of meter sizing, backflow prevention design, and location of hydrants and Siamese connections that conform to BWSC and Boston Fire Department requirements.

### 6.2.4 Water Supply System Mitigation

As discussed in the Sewer System Mitigation Section, water conservation measures such as lowflow fixtures, aerated showerheads, and dual-flush toilets are being considered to reduce potable water usage. Water usage for landscape irrigation will be significantly reduced by the selection of native and adaptive plantings, and using soil moisture sensors as part of the irrigation system.

### 6.3 Storm Drainage System

### 6.3.1 Existing Drainage Conditions

The BWSC owns and maintains the sewer systems adjacent to the site (See Figure 6-1). There are existing BWSC storm drain mains located in Tremont Street, Gurney Street, and Station Street. There is a 12 -inch BWSC storm drain main in Gurney Street. There is a 24 -inch BWSC storm drain main and a 48 -inch BWSC storm drain main in Tremont Street. There is also a 12inch BWSC storm drain main in Station Street. Additionally, the 204-inch by 186-inch (17-feet by 15.5 feet) Stony Brook Combined Sewer flows through the Project site.

The 12 -inch storm drain main in Gurney Street flows southerly to the 24 -inch storm drain main in Tremont Street. Both the 24 -inch storm drain main and the 48 -inch storm drain main flow easterly to the 208 -inch by 186 -inch combined Stony Brook Combined Sewer. As described previously, the MWRA's 204-inch by 186 -inch (17-feet by 15.5 feet) Stony Brook Combined Sewer enters the site from Tremont Street flowing northerly, where it bends west and exits the site flows westerly into Gurney Street. There is a 30 -inch storm drain main in a 20 -foot wide drainage easement on site, which flows westerly and connects to the 204 -inch by 186 -inch Stony Brook Combined Sewer. The 204 -inch by 186 -inch Stony Brook Combined Sewer continues flowing to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal, or during times of high flow, discharges to the Charles River. Furthermore, the 12-inch storm drain
main flows easterly and connects to the 12 -inch combined sewer main in Mindoro Street, which flows northerly. The 12 -inch combined sewer in Mindoro Street continues flowing to the 15 -inch combined sewer main in Prentiss Street, and eventually, the main continues flowing to the Stony Brook Combined Sewer at Forsyth Way. As previously described, the Stony Brook Combined Sewer continues flowing to the MWRA Deer Island Waste Water Treatment Plant for treatment and disposal, or during times of high flow, discharges to the Charles River.

The existing site is mostly comprised of paved and dirt areas, and approximately $24 \%$ of the existing site is impervious. Stormwater runoff from the site sheet flows to the adjacent catch basins in Tremont Street, Gurney Street, and/or Station Street. There are several catch basins on the site that collect stormwater, which flow to the 30 -inch storm drain main on site and connect to the Stony Brook Combined Sewer. The 30 -inch storm drain on site also collects stormwater pumped from the adjacent MBTA rail boat section.

### 6.3.2 Proposed Drainage Systems

The Full Build Project will be comprised of four buildings, paved areas, and some landscaped areas, but will be nearly 86 -percent ( $86 \%$ ) impervious cover. The amount of impervious area at the site will increase compared to the existing condition due to the Proposed Project. The Project will be designed to meet or decrease peak rates of stormwater runoff compared to predevelopment conditions. The Project will also promote stormwater recharge to groundwater as well as substantially improve the water quality. The Project will meet the Department of Environmental Protection's (DEP) Stormwater Management Standards for redevelopment.

It is expected that each building will have a separate underground subsurface infiltration system to collect stormwater from impervious areas and building roof. The infiltration systems will have overflows tied into the storm drain Mains in Gurney Street, Tremont Street, Station Street and/or the Stony Brook Conduit, that will be used during large storm events. It is anticipated that the equivalent of 1 inch over the site's impervious area can be recharged as prescribed in BWSC's Site Plan Requirements. Stormwater runoff from vehicular areas will be treated through the use of deep sump catch basins and water quality treatment structures. An operation and maintenance plan will be developed to support the long-term functionality of the proposed stormwater management system.

Improvements and connections to BWSC infrastructure will be reviewed as part of BWSC's site plan review process. The process will include a comprehensive design review of the proposed service connections, and assessment of Project demands and system capacity.

### 6.3.3 Water Quality

The Proposed Project will improve the quality of stormwater leaving the site. Erosion and sediment control measures will be implemented during construction to minimize the transport of site soils to off-site areas and BWSC storm drain systems. During construction, existing catch basins will be protected with filter fabric, straw bales and/or crushed stone, to provide for
sediment removal from runoff. These controls will be inspected and maintained throughout the construction phase until the areas of disturbance have been stabilized through the placement of pavement, structure, or vegetative cover.

All necessary dewatering will be conducted in accordance with applicable MWRA and BWSC discharge permits. Once construction is complete, the Proposed Project will be in compliance with local and state stormwater management policies, as described below.

## DEP Stormwater Management Policy Standards

In March 1997, MassDEP adopted a new Stormwater Management Policy to address non-point source pollution. In 1997, MassDEP published the Massachusetts Stormwater Handbook as guidance on the Stormwater Policy, which was revised in February 2008. The Policy prescribes specific stormwater management standards for development projects, including urban pollutant removal criteria for projects that may impact environmental resource areas. Compliance is achieved through the implementation of Best Management Practices (BMPs) in the stormwater management design. The Policy is administered locally pursuant to MGL Ch. 131, s. 40.

A brief explanation of each Policy Standard and the system compliance is provided below:

Standard \#1: No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Compliance: The proposed design will comply with this Standard. The design will incorporate the appropriate stormwater treatment and no new untreated stormwater will be directly discharged to, nor will erosion be caused to wetlands or waters of the Commonwealth as a result of stormwater discharges related to the Project.

Standard \#2: Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR.

Compliance: The proposed design will comply with this Standard. The existing discharge rate will be met or decreased as a result of the improvements associated with the Project.

Standard \#3: Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmental sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Compliance: The Project will comply with this standard to the maximum extent practicable. The Project will recharge a volume of one inch over the impervious area.

Standard \#4: Stormwater management systems shall be designed to remove $80 \%$ of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:
a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan, and thereafter are implemented and maintained;
b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Compliance: The proposed design will comply with this standard. Within the Project's limit of work, there will be mostly roof, landscaping, and pedestrian areas. Runoff from paved areas that would contribute unwanted sediments or pollutants to the existing storm drain system will be collected by deep sump, hooded catch basins and conveyed through water quality units before discharging into the BWSC system.

Standard \#5: For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26-53 and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Compliance: The proposed design will comply with this standard. The Project is not associated with Higher Potential Pollutant Loads (per the Policy, Volume I, page 1-6).

Standard \#6: Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1 or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater
discharges to a Zone I or Zone A are prohibited unless essential to the operation of a public water supply.

Compliance: The proposed design will comply with this Standard. The Project will not discharge untreated stormwater to a sensitive area or any other area.

Standard \#7: A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Compliance: The proposed design will comply with this Standard. The Project complies with the Stormwater Management Standards as applicable to the redevelopment.

Standard \#8: A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

Compliance: The Project will comply with this standard. Sedimentation and erosion controls will be incorporated as part of the design of these projects and employed during construction.

Standard 9: A Long-Term Operation and Maintenance (O\&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed.

Compliance: The Project will comply with this standard. An O\&M Plan including long-term BMP operation requirements will be prepared for the Proposed Project and will assure proper maintenance and functioning of the stormwater management system.

Standard 10: All illicit discharges to the stormwater management system are prohibited.
Compliance: The Project will comply with this standard. There will be no illicit connections associated with the Proposed Project.

### 6.4 Electric Systems

NSTAR provides electric service in the city of Boston. There is existing underground service in the Project Area. It is expected that electrical service can be provided by NSTAR. Electric power supply design, and any upgrades that may be required, will be further coordinated with NSTAR as the design for each phase progresses.

The Proponent will work the City of Boston’s Public Works Department, Street Lighting Section to determine the adequacy of street lighting in the area, and coordinate any temporary or permanent relocations of the street lighting.

### 6.5 Natural Gas Requirements

National Grid provides natural gas in the Project Area. There is an existing 12-inch gas line in Tremont Street servicing the Roxbury Crossing Senior Building across from the Parcel 25 Phase 1 site. It is expected that there is adequate supply of natural gas in the area. To the extent possible, energy-saving measures will be incorporated into the building design and construction. It is expected that this line has adequate capacity to serve the Proposed Project.

### 6.6 Telephone and Cable Systems

Verizon provides telephone service in the Project Area. There is underground telephone service in the area. It is anticipated that telephone service can be provide by Verizon. Any upgrades will be coordinated with Verizon.

Comcast and RCN provide cable service in the Project Area. Cable lines already exist on the overhead wires and in the underground services in the Project Area. It is expected that Comcast and/or RCN can provide services to the Project site via underground facilities. Any upgrade required to the service(s) will be coordinated with the services provider(s).

### 6.7 Steam Systems

The Proposed Project is not expected to require steam service.

### 6.8 Utility Protection During Construction

Existing public and private infrastructure located within nearby public rights-of-way will be protected during Project construction. The installation of proposed utility connections within public ways will be undertaken in accordance with BWSC, Boston Public Works Department, the Dig-Safe Program, and applicable utility company requirements. Specific methods for constructing proposed utilities where they are near to, or connect with, existing water, sewer, and drain facilities will be reviewed by the BWSC as part of its Site Plan Review process. All necessary permits will be obtained before the commencement of work.

### 7.0 Transportation Component

### 7.1 Introduction

### 7.1.1 Purpose of the Transportation Component

Howard/Stein-Hudson Associates, Inc. (HSH) has conducted an evaluation of the transportation impacts of the proposed Parcel 25 mixed-use development project (the "Project" and/or the "Site") located in the Mission Hill neighborhood of Boston. The following transportation study adheres to the Boston Transportation Department (BTD) Transportation Access Plan Guidelines and Boston Redevelopment Authority's (BRA) Development Review Guidelines (2006). This study includes an evaluation of existing transportation conditions; future transportation conditions with and without the Project; roadway, pedestrian, and bicycle conditions; transportation issues; parking and loading; pedestrian and bicycle circulation; proposed mitigation; and transportation goals for the Project.

### 7.1.2 Project Description

The Project site is located on a former MBTA owned parcel bounded by Tremont, Gurney, and Station Streets, an MBTA Pumping Station, and the MBTA tracks and next to them the Southwest Corridor, and also includes a parcel on the northeast corner of Gurney Street (see Figure 7-1). The Project site is located across Tremont Street from the Roxbury Crossing MBTA station and is within walking distance to several MBTA and private bus services. The existing Project site contains a vacant parking lot enclosed by a chain-link fence.

Upon completion, the proposed mixed-use Project would involve the development of approximately 305,750 gross square feet (gsf) to be completed in three phase, which will include at full-build out approximately 88 apartment units, $10,000 \mathrm{gsf}$ of retail space, $1,250 \mathrm{gsf}$ of community space, $196,500 \mathrm{gsf}$ of office space, and 201 surface and below grade parking spaces. Of this overall build-out, the Phase I development would include 40 residential apartment units, $10,000 \mathrm{gsf}$ of retail, $35,000 \mathrm{gsf}$ of office space, $1,250 \mathrm{gsf}$ of community space, and 56 surface parking spaces. Vehicular access/egress for all phases of the Project will be provided on Station Street and a curb-cut on Gurney to the Gurney Street lot on Parcel 25B.

Figure 7-1.
Site Locus and Study Area Map

### 7.1.3 Study Area

The transportation study area is generally bound by Tremont Street to the east and south, Parker Street west, and Prentiss Street to the north. The study area includes the following five intersections (see Figure 7-1):

- Tremont Street at Prentiss Street (signalized);
- Tremont Street at Columbus Avenue/Malcolm X Boulevard (signalized);
- Tremont Street at Gurney Street/Terrace Street (signalized);
- Tremont Street at Parker Street (signalized); and
- Parker Street at Station Street (unsignalized).


### 7.1.4 Study Methodology

The existing conditions analysis includes an inventory of the transportation conditions such as roadway capacities, traffic characteristics, parking and curb usage, transit, pedestrian circulation, bicycle facilities, loading, and site conditions. As required by the BTD, existing counts were conducted for vehicles, bicycles, and pedestrians at the study area intersections. The traffic counts form the basis for the transportation analysis conducted as part of this evaluation.

The future transportation conditions analysis evaluates potential transportation impacts associated with the Project. Long-term impacts are evaluated for the year 2019, based on a five-year horizon from the existing year (2014). Expected roadway, parking, transit, pedestrian, bicycle accommodation, and loading capacities and deficiencies are identified. This section includes the following scenarios:

- The 2019 No-Build conditions scenario includes both general background traffic growth and traffic growth associated with specific developments and transportation improvements that are planned in the vicinity of the Project site.
- The 2019 Build conditions scenario is broken into two phases, Phase I and Full Build. Phase I Build Conditions includes adding project-generated traffic volume estimates for Phase I to the traffic volumes developed as part of the 2019 No-Build conditions scenario. The Full Build Condition adds the Phase II and Phase III project-generated trips to the 2019 Build Phase I conditions scenario.

The final part of the transportation study identifies measures to mitigate Project-related impacts and to address any traffic, pedestrian, bicycle, transit, safety, or construction related issues that are necessary to accommodate the Project.

An evaluation of short-term traffic impacts associated with construction activities is also provided.

### 7.2 Existing Transportation Conditions

This section includes descriptions of existing study area roadway geometries, intersection traffic control, peak-hour vehicular, bicycle, and pedestrian volumes, transit availability, parking and curb usage, and loading conditions.

### 7.2.1 Existing Roadway Conditions

The major study area roadways are described below. The descriptions reflect functional classifications by the Massachusetts Department of Transportation (MassDOT) Highway Division's Office of Transportation Planning.

Tremont Street borders the Project site to the south, and is classified by the Massachusetts Department of Transportation (MassDOT) as a principal arterial where the road runs north-south, and an urban principal arterial along the east-west portion of the roadway. Within the study area, Tremont Street runs in a north-south direction east of the site between Court Street/Cambridge Street to the north, and Malcolm X Boulevard/Columbus Avenue to the south where it turns in an east-west direction towards Brigham Circle to the west. Between Prentiss Street and Malcolm X Boulevard, Tremont Street generally has three travel lanes in each direction with no on-street parking. Between Brigham Circle and Columbus Ave, Tremont Street is generally one travel lane in either direction with on-street parking located on each side of the roadway. However, between Columbus Avenue and Gurney Street, Tremont often functions as two lanes in each direction. MBTA bus route 66 runs along Tremont Street within the study area. Sidewalks are provided along both sides of the roadway, including the Southwest Corridor which runs along the west side of Tremont Street.

Gurney Street borders the Project site to the west, and runs in a north-south direction between Tremont Street and Halleck Street (a.k.a. Gurney Street Extension) and an east-west direction between Parker Street and Halleck Street. Adjacent to the site, Gurney Street consists of a oneway northbound travel lane with parking on both sides of the road. Sidewalks are provided along both sides of the road and are partially covered with litter/debris and overgrown vegetation.

Halleck Street (Gurney Street Extension) borders the Project site to the west, and runs in a north-south direction between Gurney Street to the south and Prentiss Street to the north. Between Gurney Street and Station Street, Halleck Street consists of one travel lane in either direction with parking on the east side of the road. There are no pavement markings to delineate the two way roadway, and signage is confusing to motorists, so the roadway typically functions as one-way northbound roadway and motorists generally park on both sides of the street. Sidewalks are provided along both sides of the road and are partially covered with litter/debris
and overgrown vegetation. Halleck Street is one-way southbound from Prentiss Street to Station Street with parking on each side of the roadway.

Station Street borders the Project site to the north, and runs in an east-west direction throughout the study area between Parker Street to the west and Mindoro Street to the east. Adjacent to the Project site, Station Street consists of one travel lane in either direction with no on-street parking. Station Street is one-way from Halleck Street to Parker Street with parking allow on the north side of the roadway. Sidewalks are provided along both sides of the road and are partially covered with litter/debris and overgrown vegetation.

### 7.2.2 Existing Intersection Conditions

The existing study area intersections are described below. Intersection characteristics such as traffic control, lane usage, pedestrian facilities, pavement markings, and adjacent land use are described.

Tremont Street/Prentiss Street is a signalized intersection with three approaches. The Prentiss Street eastbound approach consists of a 13 -foot shared left-turn/right-turn lane. The Tremont Street northbound approach consists of one shared left-turn/through lane and two through lanes. The Tremont Street southbound approach consists of two through lanes and one through/rightturn lane. All lanes along Tremont Street are 11 -feet wide. There is a MBTA bus stop at both Tremont Street approaches which causes the outer most lanes at each approach to block during the occasional bus stop. The curb use along Tremont Street southbound is restricted to Boston Police Department (BPD) parking only which may fill up to the approach, creating a 20 -foot storage lane for right-turn maneuvers only. Sidewalks line both sides of all the approaches and crosswalks are located at each approach. Pavement markings are in good condition.

Tremont Street/ Malcolm X Boulevard/Columbus Avenue is a signalized intersection with four approaches. The Tremont Street eastbound approach consists of an 11 -foot left-turn/through lane and a 11 -foot through/right-turn lane. These lanes are not clearly marked. The Malcolm X Boulevard westbound approach consists of a 12 -foot left-turn/through lane, a 12 -foot through lane, and a 24 -foot channelized right-turn lane. These lanes are not clearly marked. The Columbus Avenue northbound approach consists of a 10 -foot exclusive left-turn lane, two 12foot through lanes, and a 12 -foot through/right-turn lane. The Tremont Street southbound approach consists of a 10 -foot exclusive left-turn lane, two 11 -foot through lanes, and an 11-foot through/right-turn lane. Sidewalks are provided along all roads, and crosswalks are provided across each approach. Pavement markings are generally in fair condition; however, lane designations on the eastbound and westbound approaches are completely faded. The pavement is generally in fair to good condition; however, the pavement on the Tremont Street eastbound approach has rutted. The Southwest Corridor Bike Path crosses the west leg of the intersection at Tremont Street. Cyclists cross Tremont Street using pedestrian ramps and typically cross during the all-pedestrian phase.

Tremont Street/Gurney Street/Terrace Street is a four-leg signalized intersection with three approaches. The Tremont Street eastbound approach consists of one 14 -foot shared left-turn/through/right-turn lane with an adjacent 8-foot parking lane. The Tremont Street westbound approach consists of one shared left-turn/through lane and one through/right-turn lane with an adjacent 8 -foot parking lane. The Terrace Street southbound approach consists of one 12 -foot shared left-turn/through/right-turn lane. The Gurney Street north leg of the intersection is one way northbound. Sidewalks are provided along all roadways and crosswalks are located across each approach. Pavement markings are generally worn at the intersection. During field data collection, HSH noted that the pedestrian push buttons did not work and the pedestrian signals were not illuminating at the Tremont Street approaches.

Tremont Street/Parker Street is a four-leg signalized intersection with three approaches. The Tremont Street eastbound approach consists of one 16-foot shared left-turn/through/right-turn lane with an adjacent 8 -foot parking lane. The Tremont Street westbound approach consists of one 14 -foot shared left-turn/through lane and one 14 -foot shared through/right-turn lane with an adjacent 8 -foot parking lane. The Parker Street southbound approach consists of a 16 -foot shared left-turn/through/right-turn lane with an adjacent 8 -foot parking lane. Sidewalks line both sides of the road and crosswalks are provided at all approaches. The Tremont Street westbound approach does not have a pedestrian signal head and has a 90 -foot long crossing distance.

Parker Street/Station Street is an unsignalized intersection with three approaches. The Station Street westbound approach is Stop controlled and consists of a 16-foot shared left-turn/right-turn lane with an 8 -foot parking lane along the north side of the road. The Parker Street northbound and southbound approaches consist of a 12 -foot through travel lane and an adjacent 8-foot parking lane. Sidewalks are providing along both sides of the road at all approaches and a crosswalk is provided at the Station Street approach.

### 7.2.3 Existing Traffic Conditions

Tremont Street/Malcolm X Boulevard/Columbus Avenue - In August 2014 HSH completed a traffic study for the Boston Bicycle Network Plan. This analysis included data collection efforts at the Tremont Street/Malcolm X Boulevard/Columbus Avenue intersection. Turning movement counts (TMCs) were conducted on October 4, 2012 during the weekday morning and weekday evening peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively). The vehicle volumes were grown at a $0.5 \%$ growth rate over two years to match the Existing study base year, 2014. Based on the TMCs, the peak hours of vehicular traffic of the intersection is 7:30-8:30 a.m. and 4:15-5:15 p.m.

Tremont Street/Gurney Street/Terrace Street - Traffic movement data was collected at the intersection on Thursday, February 27, 2014. Manual turning movement counts (TMCs) were conducted during the weekday morning and weekday evening peak periods (7:00-9:00 a.m. and 4:00-6:00 p.m., respectively). Based on the TMCs, the peak hours of vehicular traffic of the intersection are 7:15-8:15 a.m. and 5:00-6:00 p.m.

Turning movement data was collected at the remaining three study area intersections on Thursday May 8, 2014 during morning and evening peak periods. Based on the TMCs, the peak hours of vehicular traffic of the intersection are 7:15-8:15 a.m. and 4:15-5:15 p.m.

The peak hours of the combined vehicular traffic throughout the study area is 7:15-8:15 a.m. and 5:00-6:00 p.m. The detailed traffic counts are provided in the Appendix E. The 2014 Existing weekday morning and evening peak hour traffic volumes are shown in Figure 7-2 and Figure 73 , respectively.


Figure 7-2.
Existing Conditions (2014) Turning Movement Volumes, a.m. Peak Hour (7:15 a.m. - 8:15 a.m.)

Figure 7-3.
Existing Conditions (2014) Turning Movement Volumes, p.m. Peak Hour (5:00 p.m. - 6:00 p.m.)

### 7.2.4 Existing Traffic Operations

The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 7.0) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

Level of service and delay (in seconds) are based on intersection geometry, traffic data, and traffic control for each intersection. For the signalized intersections within the study area, traffic signal timing and phasing plans provided by BTD were used in the analysis. Data collected in 2012 at the Tremont Street/Malcolm X Boulevard/Columbus Avenue intersection was verified by HSH during field observations on February 27, 2014 and on May 8, 2014.

During field work on February 27, 2014, HSH noted that at the Tremont Street/Gurney Street/Terrace Street intersection, the signal timings provided by the BTD did not coincide with the signal operation in the field. HSH informed BTD of the issue and it should be resolved. For the purposes of this analysis, HSH calculated intersection capacity at this intersection using the field-checked signal timings.

Table 7-1 summarizes the delay and LOS thresholds for signalized and unsignalized intersections, as defined in the HCM. LOS A defines the most favorable condition, with minimum traffic delay. LOS F represents the worst condition (unacceptable), with significant traffic delay. The threshold at LOS E/LOS F indicates that the intersection, or intersection approach, is theoretically at capacity. However in an urban setting, LOS E/F are typical for stop controlled minor approaches that intersect a major roadway. LOS D is generally considered acceptable in an urban environment, such as the Project study area, and below theoretical operating capacity.

Table 7-1. Intersection Level of Service Criteria

| Level of Service | Average Stopped Delay (sec/veh) |  |
| :---: | :---: | :---: |
|  | Signalized Intersection | Unsignalized Intersection |
| A | $\leq 10$ | $\leq 10$ |
| B | $>10$ and $\leq 20$ | $>10$ and $\leq 15$ |
| C | $>20$ and $\leq 35$ | $>15$ and $\leq 25$ |
| D | $>35$ and $\leq 55$ | $>25$ and $\leq 35$ |
| E | $>55$ and $\leq 80$ | $>35$ and $\leq 50$ |
| F | $>80$ | $>50$ |

Table 7-2 and Table 7-3 present the 2014 Existing conditions operational analysis for the study area intersections for the a.m. and p.m. peak hours, respectively. The detailed analysis sheets are provided in the Appendix E.

Table 7-2. Existing Conditions (2014) Level of Service Summary, a.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue <br> (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 44.9 | - | - | - |
| Prentiss EB left/right | F | >80.0 | >1.00 | ~270 | \#333 |
| Tremont NB left/thru \| thru | thru | B | 19.9 | >1.00 | 185 | \#751 |
| Tremont SB thru \| thru/right | E | 56.7 | >1.00 | 426 | \#717 |
| Tremont Street at Columbus Avenue/Malcolm X Boulevard | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~371 | \#504 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~331 | \#441 |
| Malcolm X WB right | A | 0.9 | 0.39 | 0 | 0 |
| Columbus NB left | F | >80.0 | >1.00 | ~187 | \#327 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~623 | \#659 |
| Tremont SB left | F | >80.0 | >1.00 | ~161 | \#286 |
| Tremont SB thru \| thru | thru/right | D | 50.4 | 0.67 | 217 | 266 |
| Tremont Street at Terrace Street/Gurney Street | D | 35.6 | - | - | - |
| Tremont EB left/thru/right | D | 55.0 | 0.89 | 237 | 307 |
| Tremont WB left/thru \| thru/right | B | 12.1 | 0.61 | 113 | 138 |
| Terrace NB left/thru/right | D | 50.2 | 0.86 | 217 | \#446 |
| Tremont Street/Parker Street | D | 45.5 | - | - | - |
| Tremont EB left/thru/right | D | 45.9 | 0.82 | 362 | \#648 |
| Tremont WB left/thru \| thru/right | B | 17.2 | 0.46 | 165 | 207 |
| Parker SB left/thru/right | F | >80.0 | 0.95 | 293 | \#474 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 12.6 | 0.22 | - | 21 |
| Parker NB thru | A | 0.0 | 0.24 | - | 0 |
| Parker SB thru | A | 0.0 | 0.16 | - | 0 |

$\#=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$m=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a LOS of E or F.

Table 7-3. Existing Conditions (2014) Level of Service Summary, p.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 42.0 | - | - | - |
| Prentiss EB left/right | E | 78.4 | 0.93 | 284 | \#418 |
| Tremont NB left/thru \| thru | thru | C | 20.4 | 0.77 | 207 | \#531 |
| Tremont SB thru \| thru/right | E | 56.6 | >1.00 | 521 | \#926 |
| Tremont Street at Columbus | F | >80.0 | - | - | - |
| Avenue/Malcolm X Boulevard | F |  |  |  |  |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~457 | \#585 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~252 | \#355 |
| Malcolm X WB right | A | 0.6 | 0.31 | 0 | 0 |
| Columbus NB left | F | >80.0 | 0.88 | 135 | \#260 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~424 | \#480 |
| Tremont SB left | F | >80.0 | >1.00 | ~186 | \#334 |
| Tremont SB thru \| thru | thru/right | E | 63.4 | 0.93 | 367 | \#456 |
| Tremont Street at Terrace Street/Gurney Street | D | 38.0 | - | - | - |
| Tremont EB left/thru/right | E | 64.9 | 0.90 | 244 | \#421 |
| Tremont WB left/thru \| thru/right | A | 9.4 | 0.46 | 70 | 88 |
| Terrace NB left/thru/right | C | 34.7 | 0.67 | 150 | \#292 |
| Tremont Street/Parker Street | E | 57.4 | - | - | - |
| Tremont EB left/thru/right | C | 28.4 | 0.74 | 379 | 551 |
| Tremont WB left/thru \| thru/right | C | 20.0 | 0.42 | 145 | 160 |
| Parker SB left/thru/right | F | >80.0 | >1.00 | ~517 | \#687 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 10.8 | 0.19 | - | 17 |
| Parker NB thru | A | 0.0 | 0.12 | - | 0 |
| Parker SB thru | A | 0.0 | 0.24 | - | 0 |

\# $=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$m=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a LOS of E or F.

Typically, LOS D or better is considered acceptable in an urban environment such as this study area. The following details intersections and approaches with a LOS E or LOS F.

Tremont Street/Prentiss Street - During the a.m. and p.m. peak hours, the overall intersection operates at a LOS D, however the Prentiss Street eastbound approach operates at a LOS F and a LOS E during the a.m. and p.m. peak hour respectively. The Tremont Street southbound approach operates at a LOS E during both peak hours.

Tremont Street/Malcolm X Boulevard/Columbus Avenue - During the a.m. and p.m. peak hours, the intersection operates at a LOS F. The Tremont Street eastbound approach operates at a LOS F. The Malcolm X Boulevard westbound left-turn/through movements operates at a LOS F. The Columbus Avenue northbound approach operates at a LOS F. The Tremont Street southbound left-turn operates at a LOS F. The Tremont Street southbound left-turn approach operates at a LOS F. During the p.m. peak hour, the Tremont Street southbound throughmovements operate at a LOS E.

Tremont Street/Terrace Street/Gurney Street - During the p.m. peak hour, the Tremont Street eastbound approach operates at a LOS E. Field observations indicate that the signal at the intersection is not operating at its full cycle length and not utilizing a concurrent pedestrian movement. Additionally, the Terrace Street northbound left-turn is metered by the upstream traffic signal at the intersection of Tremont Street and Parker Street, which caused delay to the intersection.

Tremont Street/Parker Street - During the p.m. peak hour, the overall intersection operates at a LOS E. During both peak hours, the Parker Street southbound approach operates at a LOS F.

### 7.2.5 Existing Parking and Curb Use

On-street parking regulations within the study area are illustrated in Figure 7-4. Within the vicinity of the site, on-street parking along Tremont Street is limited to 30 minute pick-up/dropoff, MBTA bus stops, and Boston Police parking. Along Gurney Street, parking is unrestricted along both sides of the roadway. On-Street parking signage along Halleck Street adjacent to the site between Gurney Street and Station Street is unclear and motorists generally park along both sides of the roadway, even though some no parking signage is posted on the west side and the parking partially blocks two-way flow on the road. Parking is not allowed on the south side of Station Street adjacent to the site.

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Figure 7-4.
On-Street Parking
consuting Lic


### 7.2.6 Existing Public Transportation

The Project site is located directly across Tremont Street from Roxbury Crossing MBTA station. The Station provides access to the MBTA Orange Line and a number of MBTA bus routes and shuttle services. The following describes each public transportation route served by the Roxbury Crossing station, with a map of the nearby public transportation services shown in Figure 7-5.

MBTA Bus Route 19 - This route provides service between Fields Corner in Dorchester and Kenmore or Ruggles Station. Weekday service runs from approximately 6:08 a.m. to 7:08 p.m, with no service on weekends. Headways range from approximately 14 minutes to one hour.

MBTA Bus Route 22 - This route provides service between Ashmont Station in Dorchester and Ruggles Station. Weekday and Saturday service run from approximately 4:55 a.m. to 2:56 a.m., with Sunday service running from approximately 6:15 a.m. to 12:50 a.m. Headways range from approximately 7 minutes to 15 minutes.

MBTA Bus Route 29 - This route provides service between Mattapan Station and Ruggles Station. Weekday service runs from approximately 5:55 a.m. to 12:52 a.m., with Saturday service running from approximately $8: 10$ p.m. to 1:02 a.m. and no service on Sundays. Headways range from approximately 15 minutes to 45 minutes.

MBTA Bus Route 66 - This route provides service between Dudley Station and Harvard Square. Weekday and Sunday service running from approximately 4:40 a.m. to 1:34 a.m., and Friday and Saturday service ending at 3:04 a.m. Headways range from approximately 9 minutes to 17 minutes.

MBTA Orange Line - The Orange Line branch of the MBTA subway system stops at Roxbury Crossing Station and provides access between Oak Grove Station to the north and Forest Hills Station to the south. The Orange Line also provides convenient access to downtown Boston, Roxbury, and Everett. The Orange Line operates with headways of approximately 6 to 13 minutes.

Mission Hill LINK - The Mission Hill LINK shuttle runs a circular route beginning and ending at Brigham Circle with connections to the MBTA Green Line. The Green route runs via Roxbury Crossing Station and serves neighboring streets a connection to Brigham Circle. The services runs Monday through Friday from 7:00 a.m. to 6:00 p.m. and on Saturdays from 9:00 a.m. to 12:00 p.m. There is no service provided on Sunday.

Medical Academic and Scientific Community Organization (MASCO) - In the vicinity of the Project site, MASCO provides employees and students of MASCO institutions with a free shuttle bus to serve the Longwood Medical Area from Ruggles Station and JFK/UMass Station. The shuttle also provides a connection for MASCO members who park in the lots in Mission Hill.


Figure 7-5.

### 7.2.7 Existing Pedestrian and Bicycle Conditions

Sidewalks are provided along all streets within the study area and are generally in poor condition. Adjacent to the Project site, the sidewalks are approximately 7 feet in width along Gurney Street and Terrace Street, and range between approximately 9 and 10 feet in width along Tremont Street. With Roxbury Crossing Station in the immediate study area, pedestrian activity is heavy at both study area intersections.

There is also a high volume of pedestrians crossing Tremont Street mid-block between Gurney Street and Columbus Avenue where no crosswalk is provided - with 120 pedestrians crossing midblock during the morning peak hour and 91 pedestrians crossing during the evening peak hour. Field observations by HSH indicate that this activity is likely due to the mid-block location of the Roxbury Crossing pedestrian entrance on the south side of Tremont Street and the bus stop location on the north side of Tremont Street. The existing pedestrian activity during the weekday morning and evening peak hours is show in Figure 7-6.

In the vicinity of the study area, Tremont Street (east-westbound) and Malcolm X Boulevard are designated as advanced bicycle routes and Terrace Street is designated as an intermediate bicycle route on the 2010-2011 Boston Bikes Map. The Southwest Corridor also runs through the study area in a north-southbound direction, connecting the Arborway in Jamaica Plain to Back Bay Station in downtown Boston. The existing bicycle activity during the weekday morning and evening peak hours is shown in Figure 7-7.

### 7.2.8 Bicycle and Car Sharing

Hubway is a bicycle sharing system in the Boston area, which was launched in 2011 and consists of over 100 stations and 1,000 bicycles. There is one Hubway Stations ( 15 bicycles total) located within a one-quarter mile radius (an approximately 5-10 minute walk) of the site.

Car sharing, predominantly served by Zipcar in the Boston area, provides easy access to vehicular transportation for those who do not own cars. Vehicles are rented hourly or daily and are checked out for a specific time period and returned to their original designated location. There are a total of three Zipcar locations containing 10 total vehicles just outside of a one-quarter mile radius of the Project site. Figure 7-8 shows the location of the Hubway and Zipcar locations nearest the Project site.

Figure 7-6.
Existing Conditions (2014) Pedestrian Volumes, a.m. and p.m. Peak Hours


Figure 7-7.

## Existing Conditions (2014) Bicycle Volumes, a.m. and p.m. Peak Hours



Source: Zipcar.com and Thehubway.com as of May 27, 2014

Figure 7-8.

### 7.3 Future Conditions

For transportation impact analyses, it is standard practice to evaluate two future conditions: NoBuild conditions (without the proposed project) and Build conditions (with the proposed project). In accordance with BTD guidelines, these conditions are projected to a future date five years from the Existing conditions year. For the evaluation of this Project, 2019 was selected as the horizon year for the future conditions analyses.

This section presents a description of the 2019 future conditions scenarios and includes an evaluation of the transportation facilities under the No-Build and Build conditions.

### 7.3.1 No-Build Conditions

The No-Build conditions reflect a future scenario that incorporates any anticipated traffic growth independent of the Project and any planned infrastructure improvements that will affect travel patterns throughout the study area.

## No-Build Background Growth

Two methodologies are used to account for future traffic growth, independent of the Project. The first methodology accounts for general background traffic growth that may be affected by changes in demographics, automobile usage, and automobile ownership. Based on a review of recent traffic studies conducted for projects within the vicinity of the study area, a $0.5 \%$ annual traffic growth rate was used to develop the future conditions traffic volumes.

The second methodology identifies any specific planned developments that are expected to affect traffic patterns throughout the study area within the future analysis time horizon. The following projects are located in the vicinity of the study area and, where appropriate, traffic volumes associated with these projects were also incorporated into the future conditions traffic volumes.

Tremont Crossing (Parcel 3) - proposes a mixed used development consisting of 440,000 sf of retail space, $234,000 \mathrm{sf}$ of office space, 300 residential units, 200 hotel rooms, $37,500 \mathrm{sf}$ of museum space and 1,502 parking spaces. The Proposed trip generation was obtained from the Project Notification Form, submitted by BSC Group on April 17, 2012. On August 1, 2012, the BSC Group submitted a Draft Project Impact Report to the BRA proposing the following mitigation measures along Tremont Street:

- Tremont Street/Prentiss Street Intersection Improvements - The report proposes removing the median and adding an exclusive left-turn lane at the Tremont Street northbound approach, and clustering the intersection with Tremont Street and the proposed project site driveway.
- New Traffic Controllers - Provision of four (4) new traffic controllers at the intersections of Tremont Street with the Site Drive/Prentiss Street, Ruggles Street, Malcolm X Boulevard, and Melnea Cass Boulevard.
- Tremont Signal Timing Improvements - the project proposes to modify current traffic signal timings along Tremont Street between Melnea Cass Boulevard and Malcolm X Boulevard.

The Parcel 3 Project and the associated mitigation measures are still currently under review. The proposed intersection changes at Tremont Street/Prentiss Street and related project generated trips are included in the No-Build Conditions analysis; however, the addition of the new traffic signal controllers and other signaling improvements along the Tremont Street corridor were not included as these measures have not been defined.

Parcel 10 - This project includes a 40,000 sf supermarket (Tropical Foods), 54,000 SF office/retail building and the rehabilitation of an existing $44,000 \mathrm{SF}$ structure for the provision of residential units and retail space. This project has been approved by the BRA.

1486 Tremont Street - This project will consist of 66 residential units, approximately 6,200 SF of ground floor retail space, and 60 parking spaces. Trip generation was obtained from the transportation component of the Notice of Project Change prepared by HSH on June 28, 2014. Trip distribution was obtained from the transportation component of the Expanded Project Notification Form prepared by Howard/Stein-Hudson Associates on March 29, 2006. This project has been approved by the BRA.

Bartlett Place Phase 1—Phase 1 of this project will consist of 102 residential units in two `s along with $16,839 \mathrm{SF}$ of commercial space with 130 parking spaces. Trip generation and distribution were obtained from the transportation component of the expanded project notification form prepared by Howard/Stein-Hudson Associates on March 1, 2014. This project has been approved by the BRA.

The following projects are also located in the vicinity of the Project, but have little to no impact on the roads surrounding the Site. For purposes of this study, any projected generated trips associated with these projects are assumed within the $0.5 \%$ growth rate.

Parcel 9 -- This project includes approximately 145 hotel rooms, 50 residential housing units, and approximately $7,935 \mathrm{SF}$ of ground-floor retail space, with 118 parking spaces. This project has been approved by the BRA.

Dudley Municipal Building - This Project includes a new 200,000 SF headquarters building for Boston Public Schools, which will house over 500 employees. It will include 20,000 SF of streetlevel retail space, as well as open space to showcase student work, school events, and host community gatherings. This project has been approved by the BRA and is currently under construction.

Roxbury Crossing Senior Building - This project will consist of 40 units of senior rental housing in a four story building. This project has been approved by the BRA and is currently under construction.

44-64 Terrace Street- This project will consist of 21 units of housing and 20 off-street parking spaces. This project has been approved by the BRA.

The Parker and Terrace Street Development— This project will consist of 44 residential units and 30 parking spaces. This project has been approved by the BRA.

1467 Tremont Street-This project will consist of 18 residential units and 10 parking spaces. This project has been approved by the BRA.

Thus, it is assumed that any such traffic increases would be accounted for in the background growth rate.

## Proposed Infrastructure Improvements

A review of planned improvements to roadway, transit, bicycle, and pedestrian facilities was conducted to determine if there are any nearby projects in the vicinity of the study area. The following project is currently in design process:

Boston Bicycle Network Plan - Malcolm X Boulevard: Currently, BTD is reviewing the design of a two-way cycle track along the south side of Malcolm X Boulevard between Tremont Street/Columbus Avenue and Shawmut Avenue. At the intersection of Tremont Street/Malcolm X Boulevard/Columbus Avenue, proposed modifications to the traffic signal may potentially include converting the Malcolm X Boulevard westbound through/left-turn lane into an exclusive left-turn lane with a protected left-turn phase and conversion of the all-pedestrian phase to a leading pedestrian interval (LPI). These improvements were not included in the No Build Conditions analysis as they are still under review and have not been defined.

## No-Build Traffic Operations

The 2019 No-Build conditions scenario analysis uses the same methodology as the 2014 Existing conditions scenario analysis. Table 7-4 and Table 7-5 present the 2019 No-Build conditions operations analysis for the weekday morning and evening peak hours, respectively. The shaded cells in the tables indicate a worsening in LOS between the 2014 Existing conditions and the 2019 No-Build conditions. The detailed analysis sheets are provided in Appendix E.

The 2019 No-Build Conditions were modeled assuming the correct BTD signal timing plan for the intersection of Tremont Street at Gurney Street. HSH understands that BTD will fix the cycle length and pedestrian phase issues occurring during the 2014 Existing Conditions in the near future.

Figure 7-9.
No-Build (2019) Turning Movement Volumes, a.m. Peak Hour

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Howard/Stein-Hudson Associates, Inc.
CREATVE SOLUTIONS • EFFECTVE PARTNERRG
No-Build (2019) Turning Movement Volumes, p.m. Peak Hour

Table 7-4: No-Build Conditions (2019) Level of Service Summary, a.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 47.2 | - | - | - |
| Prentiss EB left/right | F | >80.0 | $>1.00$ | 223 | \#262 |
| Tremont NB left | F | >80.0 | >1.00 | ~437 | m254 |
| Tremont NB thru \| thru | thru | C | 25.3 | 0.87 | 625 | m488 |
| Tremont SB thru \| thru/right | D | 37.3 | 0.86 | 181 | 141 |
| Tremont Street at Columbus Avenue/Malcolm X Boulevard | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~445 | m\#340 |
| Malcolm X WB left/thru \| thru | F | >80.0 | $>1.00$ | ~357 | \#469 |
| Malcolm X WB right | A | 1.0 | 0.41 | 0 | 0 |
| Columbus NB left | F | >80.0 | >1.00 | ~196 | \#338 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | $>1.00$ | ~682 | \#716 |
| Tremont SB left | F | >80.0 | >1.00 | ~180 | m\#225 |
| Tremont SB thru \| thru | thru/right | E | 69.5 | 0.72 | 275 | m317 |
| Tremont Street at Terrace Street/Gurney Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | ~825 | m\#895 |
| Tremont WB left/thru \| thru/right | C | 24.3 | 0.78 | 121 | m97 |
| Terrace NB left/thru/right | D | 41.3 | 0.72 | 338 | 476 |
| Tremont Street/Parker Street | F | >80.0 | - | , | - |
| Tremont EB left/thru/right | F | >80.0 | 0.96 | 522 | \#847 |
| Tremont WB left/thru \| thru/right | A | 5.6 | 0.49 | 64 | 104 |
| Parker SB left/thru/right | F | >80.0 | 0.96 | 302 | \#491 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 12.8 | 0.23 | - | 22 |
| Parker NB thru | A | 0.0 | 0.24 | - | 0 |
| Parker SB thru | A | 0.0 | 0.16 | - | 0 |

\# $=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from Existing Conditions

Table 7-5. No-Build Conditions (2019) Level of Service Summary, p.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | E | 60.5 | - | - | - |
| Prentiss EB left/right |  | >80.0 | >1.00 | ~386 | \#605 |
| Tremont NB left | F | >80.0 | >1.00 | $\sim 173$ | m\#166 |
| Tremont NB thru \| thru | thru | E | 60.1 | 0.87 | 496 | m447 |
| Tremont SB thru \| thru/right | B | 14.2 | 0.81 | 154 | 119 |
| Tremont Street at Columbus | F | >80.0 | - | . | . |
| Avenue/Malcolm X Boulevard |  |  |  |  |  |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | $\sim 544$ | m\#526 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | $\sim 275$ | \#380 |
| Malcolm X WB right | A | 0.7 | 0.33 | 0 | 0 |
| Columbus NB left | F | >80.0 | 0.91 | 140 | \#272 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | $\sim 474$ | \#528 |
| Tremont SB left | F | >80.0 | >1.00 | $\sim 226$ | m\#301 |
| Tremont SB thru \| thru | thru/right | F | >80.0 | >1.00 | $\sim 485$ | m\#555 |
| Tremont Street at Terrace Street/Gurney Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | $\sim 564$ | m\#917 |
| Tremont WB left/thru \| thru/right | D | 40.0 | 0.57 | 327 | m205 |
| Terrace NB left/thru/right | D | 45.7 | 0.66 | 261 | 359 |
| Tremont Street/Parker Street | F | >80.0 | - | - |  |
| Tremont EB left/thru/right | E | 59.4 | 0.83 | 466 | 698 |
| Tremont WB left/thru \| thru/right | C | 24.6 | 0.50 | 335 | 361 |
| Parker SB left/thru/right | F | >80.0 | >1.00 | $\sim 547$ | \#717 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 10.8 | 0.19 | - | 18 |
| Parker NB thru | A | 0.0 | 0.12 | - | 0 |
| Parker SB thru | A | 0.0 | 0.25 | - | 0 |

\# = $95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
$\sim$ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from Existing Conditions

As shown in Table 7-4, under No-Build Conditions for the morning peak hour, some of the intersections generally worsen. At the Tremont Street/Prentiss Street intersection, the Tremont Street northbound approach exclusive left-turn lane operates a LOS F, while the Tremont Street southbound approach improves. At the Tremont Street/Columbus Ave/Malcolm X Boulevard intersection, the Tremont Street southbound through lanes worsens from a LOS D to LOS E. As a result of changing the signal timing at Tremont Street/Terrace Street/Gurney Street back to be concurrent with the other Tremont Street intersections, the overall intersection worsens from a LOS D to LOS F. The Tremont Street eastbound approach worsens from a LOS D to LOS F and the westbound approach worsens from a LOS B to LOS C. The Tremont Street/Parker Street intersection and the Tremont Street eastbound approach worsen from a LOS D to LOS F.

As shown in Table 7-4, the intersections generally worsen under evening peak hour No-Build Conditions. The Tremont Street/Prentiss Street intersection worsens from a LOS D to LOS E. The Prentiss Street eastbound approach worsens from a LOS E to LOS F. The proposed Tremont Street northbound exclusive left-turn lane will operate at a LOS F and the through travel lanes will worsen from a LOS C to LOS E, while the Tremont Street southbound approach improves. At the Tremont Street/Columbus Ave/Malcolm X Boulevard intersection, the Tremont Street southbound through lanes worsens from a LOS E to LOS F. As a result of changing the signal timing at Tremont Street/Terrace Street/Gurney Street back to be concurrent with the other Tremont Street intersections, the overall intersection worsens from a LOS D to LOS F. The Tremont Street eastbound approach worsens from a LOS E to LOS F, the westbound approach worsens from a LOS A to LOS D, and the Terrace Street northbound approach worsens from a LOS C to LOS D. The Tremont Street/Parker Street intersection worsens from a LOS E to LOS F and the Tremont Street eastbound approach worsens from a LOS C to LOS F.

### 7.3.2 Build Conditions

Upon completion, the proposed mixed-use Project would involve the development of approximately 305,750 gross square feet (gsf) to be completed in three phases. Table 7-6 contains a breakdown of the multiple phases of the Proposed Project.

Table 7-6. Parcel 25 Project Description

| Land Use | Phase I | Phase II | Phase III | Full Build |
| :---: | :---: | :---: | :---: | :---: |
| Apartment (units) | 40 | 48 | - | $\mathbf{8 8}$ |
| Office (sf) | 35,000 | - | 161,500 | $\mathbf{1 9 6 , 5 0 0}$ |
| Retail (sf) | 10,000 | - | - | $\mathbf{1 0 , 0 0 0}$ |
| Community (sf) | 1,250 | - | - | $\mathbf{1 , 2 5 0}$ |
| Parking Spaces | 56 | 24 | 121 | $\mathbf{2 0 1}$ |
| TOTAL SIZE (gsf) | $\mathbf{8 8 , 2 5 0}$ | $\mathbf{5 6 , 0 0 0}$ | $\mathbf{1 6 1 , 5 0 0}$ | $\mathbf{3 0 5 , 7 5 0}$ |

## Site Access and Circulation

Vehicular access and egress will occur via a proposed curb cut on Station Street and a proposed curb cut on Gurney Street to the Gurney Street Lot at Parcel 25B, as shown on Figures 7-11 through 7-13. During Phase I and Phase II, the driveway on Station Street will provide access to a surface parking lot. Under Full-Build Conditions, access to the two parking structures will be provided on Station Street.

Primary pedestrian access to the buildings will be provided on Gurney Street and Tremont Street and via a proposed pedestrian plaza that will connect Tremont Street to Gurney Street through the site.

Figure 7-11.
Proposed Site Access Plan - Phase I

Figure 7-12.
Proposed Site Access Plan - Phase II

## Trip Generation

Trip generation is a multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a proposed project and a specific land use program. A project's location and proximity to different modes determines how people will travel to and from that project site.

To estimate the number of trips expected to be generated by the Project, data published by the Institute of Transportation Engineers (ITE) in the Trip Generation Manual ${ }^{8}$ were used. ITE provides data to estimate the total number of unadjusted vehicular trips associated with the Project. In an urban setting well-served by transit, adjustments are necessary to account for other travel mode shares such as walking, bicycling, and transit.

To estimate the unadjusted number of vehicular trips for the Project, the following ITE land use codes (LUCs) were used:

LUC 220 - Apartment is defined as rental dwellings located within the same building with at least three other dwelling units. Trip generation estimates are based on average vehicle rates per unit. The Apartment land use code was selected because it has slightly higher trip generation rates than the other similar residential land uses provided in the Trip Generation Manual and presents a more conservative scenario.

LUC 710 - General Office Building is defined as a building housing multiple tenants and is a location where affairs of business, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers and tenant services, such as a bank or savings and loan institution, a restaurant or cafeteria and service retail facilities.

LUC 820 - Shopping Center is defined as an integrated group of commercial establishments that is planned, developed, owned and managed as one unit. Trip generation estimates are based on average vehicular rates per $1,000 \mathrm{sf}$ of gross leasable area. This land use was used to develop the trip generation characteristics of the commercial space on the Site.

LUC 495 - Recreational Community Centers are stand-alone public facilities and often include classes and clubs for adults and children; a day care or nursery school; meeting rooms; swimming pools and whirlpools; saunas; tennis, racquetball, handball, basketball and volleyball courts; outdoor athletic fields/courts; exercise classes; weightlifting and gymnastics equipment; locker rooms; and a restaurant or snack bar. Public access is typically allowed, but a fee may be charged. The proposed community room in Building 1A is expected to be utilized with more passive community uses than that represented in LUC 495. Therefore, LUC 495 is expected is to provide a conservative estimate of the actual trip generation.

[^17]
## Mode Split

The BTD provides vehicle, transit, and walking mode split rates for different areas of Boston. The Project is located in the northerly portion of designated Area 5, which also includes areas of Dorchester along the MBTA Red Line and Dorchester Avenue, south of the Project site. The unadjusted vehicular trips were converted to person trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA). The person trips were then distributed to different modes according to the mode shares shown in Table 7-7.

Table 7-7. Mode Split Assumptions

| Land Use | Direction | Transit Share ${ }^{\text {a }}$ | Walk/Bike Share ${ }^{\text {a }}$ | Auto Share ${ }^{\text {a }}$ |
| :---: | :---: | :---: | :---: | :---: |
| Daily |  |  |  |  |
| Apartment | In | 15\% | 38\% | 47\% |
|  | Out | 15\% | 38\% | 47\% |
| Office | In | 23\% | 20\% | 57\% |
|  | Out | 23\% | 20\% | 57\% |
| Retail | In | 21\% | 44\% | 35\% |
|  | Out | 21\% | 44\% | 35\% |
| Community | In | 21\% | 44\% | 35\% |
|  | Out | 21\% | 44\% | 35\% |
| a.m. Peak Hour |  |  |  |  |
| Apartment | In | 21\% | 39\% | 40\% |
|  | Out | 17\% | 46\% | 37\% |
| Office | In | 32\% | 20\% | 48\% |
|  | Out | 28\% | 25\% | 47\% |
| Retail | In | 29\% | 43\% | 28\% |
|  | Out | 23\% | 50\% | 27\% |
| Community | In | 29\% | 43\% | 28\% |
|  | Out | 23\% | 50\% | 27\% |
| p.m. Peak Hour |  |  |  |  |
| Apartment | In | 17\% | 46\% | 37\% |
|  | Out | 21\% | 39\% | 40\% |
| Office | In | 28\% | 25\% | 47\% |
|  | Out | 32\% | 20\% | 48\% |
| Retail | In | 23\% | 50\% | 27\% |
|  | Out | 29\% | 43\% | 28\% |
| Community | In | 23\% | 50\% | 27\% |
|  | Out | 29\% | 43\% | 28\% |

[^18]
## Vehicle Trip Generation

The trip generation process described above yields the adjusted vehicle trips associated with the Project under each Build Phase, are summarized in Table 7-8, with the detailed trip generation information provided in the Appendix E.

Table 7-8. Project Vehicle Trip Generation - Phase I

| Time Period | Direction | Phase I <br> ehicle Trips |  <br> Phase III <br> Vehicle Trips | Full Build ${ }^{3}$ <br> Vehicle Trips |
| :--- | :--- | :---: | :---: | :---: |
| Daily | In | 306 | 570 | 876 |
|  | Out | 307 | 569 | 876 |
|  | Total | 613 | 1,139 | 1,752 |
| a.m. Peak Hour | In | 21 | 114 | 135 |
|  | Out | 10 | 22 | 32 |
|  | Total | 31 | 136 | 167 |
| p.m. Peak Hour | In | 19 | 25 | 44 |
|  | Out | 29 | 98 | 127 |
|  | Total | 48 | 123 | 171 |

1. Based on ITE LUC-220 Apartment average rate; LUC 710- General Office Building average rate; LUC 820 Shopping Center average rate; LUC 495 Recreational Community Center average equation
2. Based on ITE LUC-220 Apartment average rate; LUC-710 General Office Building fitted curve equation
3. Based on ITE LUC-220 Apartment average rate; LUC 710- General Office Building fitted curve equation; LUC 820 Shopping Center average rate; LUC 495 Recreational Community Center average equation

As shown in Table 7-8, Phase I is expected to generate only approximately 31 vehicle trips during the morning peak hour ( 21 in and 10 out) and 48 vehicle trips during the evening peak hour (19 in and 29 out). Upon completion, Phase II and Phase III are expected to generate and additional approximately 136 vehicle trips during the morning peak hour (114 in and 22 out) and approximately 123 vehicle trips in the evening peak hour ( 25 in and 98 out). The Full Build Project will generate a combined total of 135 vehicle trips in the morning peak hour ( 32 in and 167 out) and 171 vehicle trips in the evening peak hour ( 44 in and 127 out). This corresponds to an increase of approximately three vehicle trips per minute on the adjacent roadway network during the peak periods due to the Full Build Project.

## Trip Distribution

The trip distribution identifies the various travel paths for vehicles arriving and leaving the Project site. Trip distribution patterns for the Project were based on BTD's origin-destination data for Area 5. The trip distribution patterns were refined based on existing traffic patterns and review of the adjacent roadway network. The trip distribution pattern for the overall Project is illustrated in Figure 7-14.

The Project-generated vehicle trips for Phase I Build and Full Build were then assigned to the study area roadway network based on the trip distribution patterns (Figure 7-15 and Figure 716). The Project-generated trips for Phase I Build Condition were added to the 2019 No-Build conditions traffic volumes to develop the 2019 Build Phase I conditions peak hour traffic volume networks. Then Phase II and III trips were added to the Build Phase I condition to develop the Full Build Condition. The resulting a.m. and p.m. peak hour traffic volume networks for Build Phase I and Full Build are shown in Figures 7-17 through Figure 7-20 for the a.m. and p.m. peak hours, respectively.

## Build Conditions Traffic Operations

The 2019 Build conditions analysis uses the same methodology as the 2014 Existing and 2019 No-Build conditions analyses. The results of the 2019 Build Conditions traffic analysis, for Phase I and Full Build, at the study are intersections are presented in Table 7-9 through Table 7-12 for the weekday morning and evening peak hours, respectively. The shaded cells in the tables indicate a decrease in LOS from the prior condition. The detailed analysis sheets are provided in the Appendix E.

Figure 7-14.
Vehicle Trip Distribution


Figure 7-15.
Project-Generated Trips, Phase I


Figure 7-16.
Project-Generated Trips, Phase II and III


Figure 7-17.
Build (2019) Conditions a.m., Phase I


Figure 7-18.
Build (2019) Conditions p.m., Phase I


Build (2019) Conditions, Full Build, a.m.
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Build (2019) Conditions, Full Build, p.m.

Table 7-9. Build Conditions (2019) Phase I - Level of Service Summary, a.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 48.2 | - | - | - |
| Prentiss EB left/right | F | >80.0 | 0.93 | 226 | \#273 |
| Tremont NB left | F | >80.0 | >1.00 | ~437 | m254 |
| Tremont NB thru \| thru | thru | C | 25.4 | 0.87 | 625 | m488 |
| Tremont SB thru \| thru/right | D | 38.8 | 0.87 | 182 | 142 |
| Tremont Street at Columbus Avenue/Malcolm X Boulevard | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~444 | m\#316 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~361 | \#472 |
| Malcolm X WB right | A | 1.0 | 0.41 | 0 | 0 |
| Columbus NB left | F | >80.0 | >1.00 | ~198 | \#340 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~682 | \#716 |
| Tremont SB left | F | >80.0 | >1.00 | ~182 | m\#226 |
| Tremont SB thru \| thru | thru/right | E | 69.4 | 0.72 | 275 | m316 |
| Tremont Street at Terrace | F | >80.0 | - | - | - |
| Street/Gurney Street |  |  |  |  |  |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | ~852 | m\#911 |
| Tremont WB left/thru \| thru/right | C | 25.2 | 0.79 | 124 | m97 |
| Terrace NB left/thru/right | D | 41.8 | 0.73 | 345 | 484 |
| Tremont Street/Parker Street | F | >80.0 | ${ }^{-}$ | - | - |
| Tremont EB left/thru/right | F | >80.0 | 0.97 | 528 | \#852 |
| Tremont WB left/thru \| thru/right | A | 5.7 | 0.49 | 65 | 104 |
| Parker SB left/thru/right | F | >80.0 | 0.97 | 306 | \#499 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 13.0 | 0.25 | - | 24 |
| Parker NB thru | A | 0.0 | 0.24 | - | 0 |
| Parker SB thru | A | 0.0 | 0.16 | - | 0 |

\# = $95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
$\sim$ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$m=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from No Build Conditions

Table 7-10. Build Conditions (2019) Phase I - Level of Service Summary, p.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | E | 61.4 | - | - | - |
| Prentiss EB left/right | F | >80.0 | >1.00 | ~390 | \#620 |
| Tremont NB left | F | >80.0 | >1.00 | ~172 | m\#165 |
| Tremont NB thru \| thru | thru | E | 60.1 | 0.87 | 496 | m447 |
| Tremont SB thru \| thru/right | B | 14.1 | 0.81 | 156 | 120 |
| Tremont Street at Columbus | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~545 | m\#521 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~280 | \#384 |
| Malcolm X WB right | A | 0.7 | 0.33 | 0 | 0 |
| Columbus NB left | F | >80.0 | 0.92 | 142 | \#278 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~474 | \#528 |
| Tremont SB left | F | >80.0 | >1.00 | ~232 | m\#304 |
| Tremont SB thru \| thru | thru/right | F | >80.0 | >1.00 | ~486 | m\#554 |
| Tremont Street at Terrace Street/Gurney Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | ~642 | m\#917 |
| Tremont WB left/thru \| thru/right | D | 42.4 | 0.57 | 332 | m205 |
| Terrace NB left/thru/right | D | 46.1 | 0.67 | 266 | 365 |
| Tremont Street/Parker Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | E | 60.6 | 0.83 | 468 | 702 |
| Tremont WB left/thru \| thru/right | C | 24.6 | 0.50 | 335 | 362 |
| Parker SB left/thru/right | F | >80.0 | >1.00 | ~565 | \#737 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 11.3 | 0.23 | - | 22 |
| Parker NB thru | A | 0.0 | 0.13 | - | 0 |
| Parker SB thru | A | 0.0 | 0.25 | - | 0 |

\# $=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from No Build Conditions

Table 7-11. Build Conditions (2019) Full Build - Level of Service Summary, a.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 53.2 | - | - | - |
| Prentiss EB left/right | F | >80.0 | 0.95 | 233 | \#285 |
| Tremont NB left | F | >80.0 | >1.00 | ~436 | m254 |
| Tremont NB thru \| thru | thru | C | 25.7 | 0.87 | 625 | m489 |
| Tremont SB thru \| thru/right | D | 51.3 | 0.89 | 533 | 587 |
| Tremont Street at Columbus Avenue/Malcolm X Boulevard | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~444 | m\#183 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~369 | \#481 |
| Malcolm X WB right | A | 1.0 | 0.41 | 0 | 0 |
| Columbus NB left | F | >80.0 | >1.00 | ~221 | \#364 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~682 | \#716 |
| Tremont SB left | F | >80.0 | >1.00 | ~185 | m\#220 |
| Tremont SB thru \| thru | thru/right | E | 68.8 | 0.72 | 275 | m307 |
| Tremont Street at Terrace Street/Gurney Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | ~1002 | m\#1045 |
| Tremont WB left/thru \| thru/right | C | 30.0 | 0.83 | 144 | m96 |
| Terrace NB left/thru/right | D | 43.5 | 0.75 | 366 | 513 |
| Tremont Street/Parker Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | 0.99 | 556 | \#875 |
| Tremont WB left/thru \| thru/right | A | 6.3 | 0.49 | 65 | 103 |
| Parker SB left/thru/right | F | >80.0 | 0.97 | 310 | \#507 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | 13.7 | 0.29 | - | 30 |
| Parker NB thru | A | 0.0 | 0.24 | - | 0 |
| Parker SB thru | A | 0.0 | 0.16 | - | 0 |

$\#=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
$\sim$ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from No Build Conditions

Table 7-12. Build Conditions (2019) Full Build - Level of Service Summary, p.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th Percentile Queue (ft) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | E | 67.7 | - | - | - |
| Prentiss EB left/right | F | >80.0 | $>1.00$ | ~445 | \#676 |
| Tremont NB left | F | >80.0 | >1.00 | ~173 | m\#165 |
| Tremont NB thru \| thru | thru | E | 60.1 | 0.87 | 496 | m447 |
| Tremont SB thru \| thru/right | B | 14.9 | 0.82 | 158 | 122 |
| Tremont Street at Columbus | F | >80.0 | - | - | - |
| Tremont EB left/thru \| thru/right | F | >80.0 | >1.00 | ~545 | m\#505 |
| Malcolm X WB left/thru \| thru | F | >80.0 | >1.00 | ~281 | \#385 |
| Malcolm X WB right | A | 0.7 | 0.33 | 0 | 0 |
| Columbus NB left | F | >80.0 | 0.94 | 145 | \#283 |
| Columbus NB thru \| thru | thru/right | F | >80.0 | >1.00 | ~474 | \#528 |
| Tremont SB left | F | >80.0 | $>1.00$ | ~253 | m\#323 |
| Tremont SB thru \| thru | thru/right | F | >80.0 | >1.00 | ~490 | m\#551 |
| Tremont Street at Terrace Street/Gurney Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | F | >80.0 | >1.00 | ~810 | m\#931 |
| Tremont WB left/thru \| thru/right | D | 44.6 | 0.58 | 337 | m206 |
| Terrace NB left/thru/right | D | 46.4 | 0.68 | 270 | 370 |
| Tremont Street/Parker Street | F | >80.0 | - | - | - |
| Tremont EB left/thru/right | E | 67.6 | 0.84 | 475 | 710 |
| Tremont WB left/thru \| thru/right | C | 24.6 | 0.50 | 335 | 362 |
| Parker SB left/thru/right | F | >80.0 | $>1.00$ | ~613 | \#785 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street | - | - | - | - | - |
| Station WB left/right | B | 13.1 | 0.37 | - | 44 |
| Parker NB thru | A | 0.0 | 0.13 | - | 0 |
| Parker SB thru | A | 0.0 | 0.25 | - | 0 |

$\#=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal Gray shading indicates a worsening LOS from No Build Conditions

As shown in Table 7-9 through Table 7-12, all intersections will continue to operate at the same level of service under Phase I Build Conditions during the morning and evening peak hours; however, several of the intersection will continue to operate at LOS E or F.

The Phase I Build Condition is expected to generate only 31 vehicle trips during the morning peak hour and 48 vehicle trips during the evening peak hour. This corresponds to less than one new vehicle trip per minute, which is expected to have negligible impact on the study area intersections.

Under Full Build Conditions all study area intersection will continue to operate at the same LOS.

## Parking

The Phase I Project will provide 56 on-site parking spaces including 40 spaces in a temporary surface lot on Parcel 25 and 16 spaces on the Gurney Street Lot at Parcel 25B. The parking will be used for residents of the 40 apartment units, and for users of the office and retail space in the Phase I building.

An additional 24 surface parking spaces will be added to the Station Street surface parking lot for the 48 residential units as part of Phase II.

For Phase III, the Project proposes to construct an additional 121 parking spaces with access off Station Street. The total number of parking spaces at full build out will be 201.

The proposed parking provision is consistent with Boston Transportation Department (BTD) guidelines in the Mission Hill neighborhood that call for a maximum 0.5 to 1.0 spaces per residential unit and 0.75 to 1.0 spaces per 1,000 sf of non-residential uses.

## Public Transportation

Based on the transit mode shares presented in Table 7-6, the future transit trips associated with the Project were estimated and are summarized in Table 7-13.

Table 7-13. Project Transit Trips

| Time Period | Direction | Phase I <br> Transit Trips |  <br> Phase III <br> Transit Trips | Full Build <br> Transit Trips |
| :--- | :--- | :---: | :---: | :---: |
| Daily | In | 185 | 265 | 450 |
|  | Out | 185 | 264 | 449 |
|  | Total | 370 | 529 | 899 |
| a.m. Peak Hour | In | 20 | 90 | 110 |
|  | Out | 8 | 13 | 21 |
|  | Total | 28 | 103 | 131 |
| p.m. Peak Hour | In | 17 | 16 | 33 |
|  | Out | 29 | 76 | 105 |
|  | Total | 46 | 92 | 138 |

As shown in Table 7-12, Phase I is expected to generate approximately 370 new transit trips daily, with 28 new transit trips ( 20 alighting and 8 boarding) during the a.m. peak hour and 46 new trips ( 17 alighting and 29 boarding) during the p.m. peak hour. Phase II and III will generate an additional 1,269 new transit trips daily, with 103 new transit trips ( 90 alighting and 13 boarding) during a.m. peak hour and an additional 92 new transit trips ( 16 alighting and 76 boarding) in the p.m. peak hour. The Full Build project will generate a combined new total of 899 trips per day, including 131 new transit trips ( 110 alighting and 21 boarding) in the a.m. peak hour and 138 new transit trips ( 33 alighting and 105 boarding) in the p.m. peak hour.

## Pedestrians

Based on the walk mode shares presented in Table 7-7, the future walk trips were estimated and are summarized in Table 7-14.

Table 7-14. Project Pedestrian and Bicycle Trips

| Time Period | Direction | Phase I <br> Walk/Bike <br> Trips |  <br> Phase III <br> Walk/Bike <br> Trips | Full Build <br> Walk/Bike <br> Trips |
| :--- | :--- | :---: | :---: | :---: |
| Daily | In | 356 | 274 | 630 |
|  | Out | 356 | 275 | 631 |
|  | Total | 712 | 549 | 1,261 |
| p.m. Peak Hour | In | 20 | 57 | 77 |
|  | Out | 16 | 19 | 35 |
|  | Total | 36 | 76 | 112 |
|  | Out | 36 | 22 | 58 |
|  | Total | 34 | 50 | 84 |

As summarized in Table 7-14, Phase I is expected to generate approximately 712 new pedestrian trips and an additional 370 new transit trips that will require a walk to or from the site. This results in an additional 1,082 new pedestrian trips per day. Approximately 36 new pedestrian trips will occur during the a.m. peak hour and 70 new pedestrian trips will occur during the p.m. peak hour. Phase II and III will generate 549 new pedestrian trips and an additional 529 new transit trips that will require a walk to or from the site. This results in an additional 1,078 new pedestrians per day. Approximately 76 new pedestrian trips will occur during the a.m. peak hour and 72 new pedestrian trips will occur during the p.m. peak hour. Upon completion of Phase II and III, the Full Build project will generate 2,160 new pedestrian trips including 1,261 new walk trips and 899 new transit trips. Approximately 112 new pedestrian trips will occur during the a.m. peak hour and 142 new pedestrian trips during the p.m. peak hour.

A proposed pedestrian plaza will connect Tremont Street to Gurney Street through the site, as show on the site plan (see Figures 7-11 through 7-13). Upon the completion of the Full Build Project, this space will allow access to all buildings upon and will be designed for pedestrian activity related to the office and retail uses of the development.

The Project is also proposing to formalize the existing informal use of a mid-block crossing on Tremont Street between Columbus Avenue and Gurney Street by installing a new crosswalk with curb extensions to shorten the pedestrian walking distance. This new crossing would provide a more direct connection between the new pedestrian plaza and the Roxbury Crossing Station entrance.

## Bicycle Accommodations

The City of Boston has established guidelines requiring projects to provide secure bicycle parking for residents, employees, and short-term bicycle racks for visitors. The Project will provide bicycle storage consistent with the City of Boston Bicycle Parking Guidelines. Table 7-15 summarizes the proposed bicycle storage for the Phase I buildings.

Table 7-15. Bicycle Storage Requirements - Phase I

| Land Use | Size | Secure/Covered <br> Racks | Outdoor Racks |
| :--- | :---: | :---: | :---: |
| Building 1A |  |  |  |
| Residential | 40 units | 40 | 8 |
| Non-Residential | 34,250 sf | 10 | 14 |
| Building 1B <br> Non-Residential | 12,000 sf | 4 | 4 |

Source: City of Boston Bicycle Parking Guidelines

Bicycle storage for Phase II and III will provide secure covered bike parking and outdoor bike racks within the City of Boston requirements. The exact location and quantities will be identified as part of the Transportation Access Plan Agreement (TAPA) process.

There is also a Hubway station located just south of the Project site at Roxbury Crossing Station, which will provide residents, employees, and visitors with convenient bicycling opportunities to travel to other parts of Boston via the Southwest Corridor.

## Loading and Service Accommodations

Service and loading activity will occur on-site for each phase of the Project within a designated loading area at the northeast corner of Building 1B. Access and egress to the loading area will be provided by a proposed curb cut along Station Street.

All recyclables and trash will be collected and stored within each building and then either wheeled to the curb or the loading area for pick-up.

Building management will coordinate all deliveries and residential move-in and move-out activity and schedule during off-peak hours when possible. Move-in and move-out activity is generally infrequent once the building is fully occupied.

### 7.4 Transportation Mitigation Measures

### 7.4.1 Phase I Build

Due to the low volume of vehicle trips generated by the proposed Phase I Project, the LOS at all study area intersections will remain unchanged from No-Build Conditions. The Phase I Build Condition is expected to generate only 31 vehicle trips during the morning peak hour and 48 vehicle trips during the evening peak hour. This corresponds to less than one new vehicle trip per minute, which is expected to have negligible impact on the adjacent roadway network. As such, mitigation is not warranted beyond providing safe vehicular and pedestrian access to and from the Project site and provision of transportation demand management (TDM) measures in support of the City's efforts to reduce dependency on the automobile. The Proponent will work with the BTD as part of the TAPA process to identify appropriate TDM measures that will take advantage of the site's transit oriented location. The proposed TDM measures for the Project are detailed in Section 7.4.3 below.

### 7.4.2 Phase II and III (Full Build) Mitigation

Under Full Build Conditions, several of the study area intersection will continue to operate at LOS E and F. At the completion of the Full Build Project, the following signal timing improvements are recommended to accommodate the Full Build Condition. It should be noted that signal timing improvements at the intersection of Tremont Street/Prentiss Street and Tremont Street/Malcolm X Boulevard/Columbus Avenue were proposed as part of the Parcel 3 Project; however, the Project is still under review and the mitigation measures have not yet been finalized.

## Tremont Street/Prentiss Street

- Retime the cycle length to 90 seconds and adjust splits accordingly. Maintain existing coordination.
- Redesign the phasing to allow for the Tremont Street northbound through approach to operate at the same time as the Tremont Street northbound exclusive left turn.


## Tremont Street/Malcolm X Boulevard/Columbus Avenue

- Retime the cycle length to 90 seconds and adjust splits accordingly. Maintain existing coordination.
- Remove the all-pedestrian phase from the cycle and use concurrent phasing. A leading pedestrian interval (LPI) of 4 seconds will be added to the intersection.
- Turn the Tremont Street eastbound shared left-turn/through lane into an exclusive leftturn lane


## Tremont Street/Gurney Street/Terrace Street

- Retime the cycle length to 90 seconds and adjust splits accordingly. Maintain existing coordination.
- Add a leading pedestrian interval (LPI) of 4 seconds to the intersection.
- Restripe the Tremont Street westbound approach to allow for one 12 -foot shared leftturn/through lane and one 12-foot shared through/right-turn lane.


## Tremont Street/Parker Street

- Retime the cycle length to 90 seconds and adjust splits accordingly. Maintain existing coordination.
- Remove the all-pedestrian phase from the cycle and use concurrent phasing. A leading pedestrian interval (LPI) of 4 seconds will be added to the intersection.
- Restripe the Tremont Street eastbound approach to allow for one 10 -foot exclusive leftturn lane and one 10 -foot shared through/right-turn lane.
- Restripe the Tremont Street westbound approach to allow for one 12 -foot shared leftturn/through lane and one 10-foot exclusive right-turn lane.

The conditions listed above were incorporated into the 2019 Full Build Conditions. The results of the 2019 Full Build Conditions with Mitigation traffic analysis are presented in Table 7-16 through Table 7-17 for the weekday morning and evening peak hours, respectively. The shaded cells in the tables indicate a decrease in LOS between the 2019 Build conditions and the 2019 Build with Mitigation conditions, and the darkened cells indicate an improvement in LOS between the 2019 Build Conditions and 2019 Build with Mitigation Conditions. The detailed analysis sheets including traffic improvements are provided in the Appendix E.

All measures will be subject to review and discussion with the Boston Transportation Department.

Table 7-16. Build Conditions (2019) with Mitigation - Level of Service Summary, a.m. Peak Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th <br> Percentile <br> Queue <br> (ft) | 95th <br> Percentile <br> Queue (ft) |  |
| :--- | :---: | :---: | :---: | ---: | ---: | :---: |
| Signalized Intersections |  |  |  |  |  |  |

$\#=95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from Build Conditions - Full Build
Black shading indicated an improved LOS from Build Conditions - Full Build

Table 7-17. Build Conditions (2019) with Mitigation - Level of Service Summary, p.m. Pk. Hour

| Intersection/Approach | LOS | Delay (s) | V/C Ratio | 50th Percentile Queue (ft) | 95th <br> Percentile <br> Queue ( ft ) |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | 42.4 | - | - | - |
| Prentiss EB left/right | F | >80.0 | >1.00 | $\sim 217$ | \#384 |
| Tremont NB left | F | >80.0 | >1.00 | ~91 | \#188 |
| Tremont NB thru \| thru | thru | B | 10.3 | 0.54 | 151 | 187 |
| Tremont SB thru \| thru/right | D | 54.1 | >1.00 | $\sim 489$ | \#625 |
| Tremont Street at Columbus Avenue/Malcolm X Boulevard | E | 73.7 | - | - | - |
| Tremont EB left | C | 22.7 | 0.64 | 56 | 76 |
| Tremont EB thru/right | F | >80.0 | >1.00 | $\sim 405$ | \#599 |
| Malcolm X WB left/thru \| thru | D | 52.5 | >1.00dl | 115 | \#198 |
| Malcolm X WB right | A | 0.7 | 0.33 | 0 | 0 |
| Columbus NB left | F | >80.0 | 0.87 | 88 | \#197 |
| Columbus NB thru \| thru | thru/right | D | 49.2 | 0.96 | 252 | \#349 |
| Tremont SB left | F | >80.0 | >1.00 | ~152 | \#283 |
| Tremont SB thru \| thru | thru/right | D | 48.7 | 0.96 | 260 | \#388 |
| Tremont Street at Terrace | E | 71.0 | - | - | - |
| Street/Gurney Street <br> Tremont EB left/thru/right | E | 63.3 | 0.85 | 279 | \#649 |
| Tremont WB left/thru \| thru/right | A | 5.8 | 0.44 | 74 | 99 |
| Terrace NB left/thru/right | F | >80.0 | >1.00 | $\sim 279$ | \#435 |
| Tremont Street/Parker Street | F | >80.0 | - |  |  |
| Tremont EB left | B | 11.5 | 0.18 | 10 | 18 |
| Tremont EB thru/right | C | 34.1 | 0.81 | 286 | \#484 |
| Tremont WB left/thru | F | >80.0 | 0.85 | 285 | 374 |
| Tremont WB right | A | 9.6 | 0.17 | 33 | 56 |
| Parker SB left/thru/right | F | >80.0 | >1.00 | ~392 | \#550 |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street | - | - | - | - | - |
| Station WB left/right | B | 13.1 | 0.37 | - | 44 |
| Parker NB thru | A | 0.0 | 0.13 | - | 0 |
| Parker SB thru | A | 0.0 | 0.25 | - | 0 |

\# = $95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
~ = Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$\mathrm{m}=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal
Gray shading indicates a worsening LOS from Build Conditions - Full Build
Black shading indicated an improved LOS from Build Conditions - Full Build

As shown in Table 7-9 through Table 7-12, Tremont Street/Malcolm X Boulevard/Columbus Avenue will improve from a LOS F to LOS E during both a.m. and p.m. peak hour. During a.m. peak hour, Tremont Street/Gurney Street/Terrace Street and Tremont Street/Parker Street will improve from a LOS F to LOS D. During the p.m. peak hour, Tremont Street/Prentiss Street will improve from a LOS E to LOS D, and Tremont Street/Gurney Street/Terrace Street will improve from a LOS F to E. Some approaches experience a reduction in level of service under the mitigated conditions.

Overall, the proposed mitigation improves or maintains the intersections' level of service from 2014 Existing Conditions to 2019 Build Conditions with Mitigation, as compared in Table 7-18 and Table 7-19.

Table 7-18. Build Conditions (2019) with Mitigation - Level of Service Comparison Table, a.m. Peak Hour

| Intersection/Approach | LOS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { Existing } \\ & 2014 \end{aligned}$ | $\begin{gathered} \text { No-Build } \\ 2019 \end{gathered}$ | Build Phase I 2019 | $\begin{aligned} & \text { Full Build } \\ & 2019 \end{aligned}$ | Full Build with Mitigation 2019 |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | D | D | D | D |
| Prentiss EB left/right | F | F | F | F | D |
| Tremont NB left |  | F | F | F | F |
| Tremont NB thru \| thru | thru | B | C | C | C | A |
| Tremont SB thru \| thru/right | E | D | D | D | F |
| Tremont Street at Columbus | F | F | F | F | E |
| Tremont EB left |  |  |  | - | E |
| Tremont EB thru/right | F | F | F | F | D |
| Malcolm X WB left/thru \| thru | F | F | F | F | E |
| Malcolm X WB right | A | A | A | A | A |
| Columbus NB left | F | F | F | F | F |
| Columbus NB thru \| thru | thru/right | F | F | F | F | F |
| Tremont SB left | F | F | F | F | F |
| Tremont SB thru \| thru | thru/right | D | E | E | E | C |
| Tremont Street at Terrace Street/Gurney | D | F | F | F | D |
| Tremont EB left/thru/right | D | F | F | F | F |
| Tremont WB left/thru \| thru/right | B | C | C | C | A |
| Terrace NB left/thru/right | D | D | D | D | E |
| Tremont Street/Parker Street | D | F | F | F | D |
| Tremont EB left | - | - | - | - | C |
| Tremont EB thru/right | D | F | F | F | B |
| Tremont WB left/thru | B | A | A | A | E |
| Tremont WB right | - | - | - | - | A |
| Parker SB left/thru/right | F | F | F | F | E |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | B | B | B | B |
| Parker NB thru | A | A | A | A | A |
| Parker SB thru | A | A | A | A | A |

\# = $95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
$\sim=$ Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$m=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal

Table 7-19. Build Conditions (2019) with Mitigation - Level of Service Comparison Table, p.m. Peak Hour

| Intersection/Approach | LOS |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{aligned} & \text { Existing } \\ & 2014 \end{aligned}$ | $\begin{gathered} \text { No-Build } \\ 2019 \end{gathered}$ | Build <br> Phase I 2019 | $\begin{aligned} & \text { Full Build } \\ & 2019 \end{aligned}$ | Full Build with Mitigation 2019 |
| Signalized Intersections |  |  |  |  |  |
| Tremont Street/Prentiss Street | D | E | E | E | D |
| Prentiss EB left/right | E | F | F | F | F |
| Tremont NB left | - | F | F | F | F |
| Tremont NB thru \| thru | thru | C | E | E | E | B |
| Tremont SB thru \| thru/right | E | B | B | B | D |
| Tremont Street at Columbus | F | F | F | F | E |
| Avenue/Malcolm X Boulevard |  |  |  |  |  |
| Tremont EB left |  | - | - | - | C |
| Tremont EB thru/right | F | F | F | F | F |
| Malcolm X WB left/thru \| thru | F | F | F | F | D |
| Malcolm X WB right | A | A | A | A | A |
| Columbus NB left | F | F | F | F | F |
| Columbus NB thru \| thru | thru/right | F | F | F | F | D |
| Tremont SB left | F | F | F | F | F |
| Tremont SB thru \| thru | thru/right | E | F | F | F | D |
| Tremont Street at Terrace Street/Gurney | D | F | F | F | E |
| Tremont EB left/thru/right | E | F | F | F | E |
| Tremont WB left/thru \| thru/right | A | D | D | D | A |
| Terrace NB left/thru/right | C | D | D | D | F |
| Tremont Street/Parker Street | E | F | F | F | F |
| Tremont EB left |  | - | - | - | B |
| Tremont EB thru/right | C | E | E | E | C |
| Tremont WB left/thru | C | C | C | C | F |
| Tremont WB right |  |  |  | - | A |
| Parker SB left/thru/right | F | F | F | F | F |
| Unsignalized Intersections |  |  |  |  |  |
| Parker Street/Station Street |  |  |  |  |  |
| Station WB left/right | B | B | B | B | B |
| Parker NB thru | A | A | A | A | A |
| Parker SB thru | A | A | A | A | A |

\# = $95^{\text {th }}$ percentile volume exceeds capacity; queue may be longer. Queue shown is maximum after 2 cycles.
$\sim=$ Volume exceeds capacity; queue is theoretically infinite. Queue shown is maximum after 2 cycles.
$m=$ Volume for $95^{\text {th }}$ percentile queue is metered by upstream signal

### 7.4.3 Transportation Demand Management

TDM measures encourage travelers to use alternatives to driving, especially during peak periods and will be facilitated by the transit oriented nature of the Project and its convenient proximity to a wide range of non-auto alternatives. The Proponent will emphasize the site's convenient transit and pedestrian access in marketing the Project to future residents and tenants.

TDM measures for the Project may include but are not limited to the following:

- Orientation Packets: The Proponent will provide orientation packets to new residents and tenants containing information on available transportation choices, including transit routes/schedules and nearby ZipCar locations. On-site management will work with residents and tenants as they move in to help facilitate transportation for new arrivals.
- Bicycle Accommodation: The Proponent will provide bicycle storage for all users of the building in secure, sheltered locations and near major building entrances consistent with City of Boston Bicycle Parking Guidelines.
- Electric Vehicle Charging: The Proponent will explore the feasibility of providing electric vehicle charging stations within the garage for the Phase III office use.
- Shared-car Services: the Proponent will explore the feasibility of providing a shared car service (e.g., ZipCar) on-site to help reduce the need for residents to own a vehicle.
- Transportation Coordinator: The Proponent will designate a transportation coordinator to oversee transportation issues including parking, service and loading, and deliveries and will work with residents as they move in to raise awareness of public transportation, bicycling, and walking opportunities.
- Project Web Site: The web site will include transportation-related information for residents, workers, and visitors.

The Proponent will work with BTD to determine an appropriate TDM program and will formalize this program in a Transportation Access Plan Agreement (TAPA) for each phase of the Project.

### 7.4.4 Evaluation of Short-term Construction Impacts

Details of the overall construction schedule, working hours, number of construction workers, worker transportation and parking, number of construction vehicles, and routes will be addressed in detail in a Construction Management Plan (CMP) to be filed with BTD in accordance with the City's transportation maintenance plan requirements. The CMP will also address the need for pedestrian detours, temporary parking for the project, lanes closures, and/or parking restrictions, if necessary, to accommodate a safe and secure work zone. To minimize transportation impacts during the construction period, the following measures will be incorporated into the Construction Management Plan:

- Construction workers will be encouraged to use public transportation and/or carpool.
- A subsidy for MBTA passes will be considered for construction workers; and
- Secure spaces will be provided on-site for workers' supplies and tools so they do not have to be brought to the site each day.


### 8.0 Coordination with Governmental Agencies

### 8.1 Architectural Access Board Requirements

This Proposed Project will comply with the requirements of the Architectural Access Board. The Project will also be designed to comply with the Standards of the Americans with Disabilities Act.

### 8.2 Massachusetts Environmental Policy Act

Based on information currently available, development of the Proposed Project may result in a state permit/state agency action and meet a review threshold that would require MEPA review by the MEPA Office of the Executive Office of Energy and Environmental Affairs. It is anticipated that an Environmental Notification Form ("ENF") will be filed following submission of the PNF along with a copy of the PNF, and a letter to MEPA requesting the Waiver of EIR and/or Phase I Waiver of EIR.

### 8.3 Boston Civic Design Commission

It is anticipated that the Proposed Project will be reviewed by the Boston Civic Design Commission as full build out with the three phases exceeds the 100,000 gross square feet size threshold requirement for review by the Boston Civic Design Commission.

### 9.0 Project Certification

This form has been circulated to the Boston Redevelopment Authority as required by Article 80 of the Boston Zoning Code.

## Mission Hill Parcel 25 LLC



Date

Mitchell L. Fischman Consulting LLC


Signature of Preparer
Mitchell L. Fischman, AICP



## Appendix A - Letter of Intent to File PNF



December 23, 2013

Mr. Peter Meade, Director
Boston Redevelopment Authority
One City Hall Square
Boston, MA 02201

## Subject: Parcel 25, Mission Hill MHNHS Development Letter of intent (LOI) to File Project Notification Form

Dear Director Meade:
Please consider this letter of intent by Mission Hill Parcel 25 LLC (the "Proponent") to submit a Project Notification Form ("PNF") to the Boston Redevelopment Authority ("BRA") pursuant to Section 80B-1 of the Boston Zoning Code (the "Code") to develop the property located on a former MBTA owned parcel bounded by Tremont, Gurney, and Station Streets, an MBTA Pumping Station and the Southwest Corridor/MBTA tracks in the Mission Hill neighborhood (the "Proposed Site").

The Proponent, an affiliate of Mission Hill Neighborhood Housing Services, Inc., is submitting a proposal for a mixed-use, residential, retail and commercial development of approximately $300,000 \mathrm{gsf}$, to be developed in three phases, which is anticipated to include at full build-out, approximately: 100,000 gsf (88 apartment units), $11,000 \mathrm{gsf}$ of retail, 7,500 gsf of community space, $185,000 \mathrm{gsf}$ of office, and 178 surface and below grade parking spaces. The Phase I development program of about 87,500 gsf (which will be initially permitted and the subject of the PNF) includes approximately: 40 residential apartment units, $11,000 \mathrm{gsf}$ of retail space, $24,000 \mathrm{gsf}$ of office space, $7,500 \mathrm{gsf}$ of community space and 51 surface parking spaces are proposed ("Proposed Phase I Project"). (See Figure 1. Parcel 25, Project Locus.).

The Proposed Phase I Project is expected to exceed the 50,000 square foot total build-out size requirement for a project in a Boston neighborhood and therefore will require preparation of filing(s) under the Large Project Review regulations, pursuant to Article 80 of the Boston Zoning Code. As the site is within an area that permits the creation of a Planned Development Area ("PDA") in accordance with Article 59 of the Boston Zoning Code, a PDA Plan will be created for the Project Site and submitted to the BRA for review in conjunction with the filing of the PNF.

Mr. Peter Meade, Director
Boston Redevelopment Authority
December 23, 2013

The Proposed Project for these long-vacant and blighted parcels is based on the community's vision that grew out of the multi-year comprehensive participatory planning process for the site and surrounds, organized and led by Mission Hill Neighborhood Housing Services and involving hundreds of neighborhood residents, businesses, and area stakeholders, institutional neighbors and elected officials.

The Proponent expects that a PNF submission will be completed over the next sixty days and will include Project impact studies.

Please contact me with any questions concerning the Proposed Project. On behalf of the entire project team, we look forward to working with you on this Project, which we believe will be a significant addition to Mission Hill, the Tremont Street mixed use neighborhood corridor, and the City of Boston as a whole.

Sincerely,

## MISSION HILL PARCEL 25 LLC



## Attachment: Figure 1. Parcel 25, Project Locus

cc: James Tierney, Esq., Boston Redevelopment Authority
Katharine Bachman, WilmerHale
Peter Munkenbeck
Mitch Fischman, Mitchell L. Fischman Consulting, LLC
Patricia Flaherty, MHNHS


Figure 1. Parcel 25, Project Locus


## Appendix B - Pedestrian Wind Assessment

## Building and Site Information

## 'Z

The proposed development site is located at the northwest corner
 Mission Hill, MA, as shown in the aerial photo in Image 1. To the
 east is the Southwest Corridor Park along the railway. The surrounding buildings are generally low, with the Longwood Medical Center area to the northwest and the Boston downtown to the distant northeast.

 three phases.


Image 1 - Aerial Photograph of Existing Site and Surroundings
(Courtesy of Google earth ${ }^{\top M}$ )
乙 əбеd



## Meteorological Data

Wind statistics at Boston-Logan International Airport between 1973 and 2013 were analyzed for the spring (March to May), summer (June to August), fall (September to November) and winter (December to February) seasons. Wind roses in Image 4 graphically depict the distributions of wind frequency and directionality for these four seasons as well as the annual period. When all winds are considered, winds from the northwest and southwest quadrants are predominant. The northeasterly winds are also frequent, especially in the spring.

Strong winds with mean speeds greater than 20 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 to the current study, while winds from other directions are also considered in our analysis.

(Kew ol чэлеw) 6u!!ds


## Explanation of Criteria

The BRA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BRA wind design guidance 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 BRA to determine the acceptability of specific locations is based on the work of Melbourne ${ }^{4}$. 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 benchmarks for the 1 -hour mean wind speed exceeded $1 \%$ of the time (i.e., the 99-percentile mean wind speed). They are as follows:

## Table 1: BRA Mean Wind Criteria *

Dangerous $>27 \mathrm{mph}$
Uncomfortable for Walking > 19 and $\leq 27 \mathrm{mph}$
$>15$ and $\leq 19 \mathrm{mph}$
Comfortable for Standing $>12$ and $\leq 15 \mathrm{mph}$
Comfortable for Sitting $<12$ mph

[^19]4. Melbourne, W.H., 1978, "Criteria for Environmental Wind Conditions", Journal of Industrial Aerodynamics, 3 (1978) 241-249.

## Pedestrian Wind Conditions

### 5.1 Background

 Predicting wind speeds and occurrence frequencies is complicated. It involves building geometry, orientation, position and height of surrounding buildings, upstream terrain and the local wind climate. Over the years, RWDI has conducted more than 2,000 wind-tunnel model studies on pedestrian wind conditions around buildings, yielding a broad knowledge base. This knowledge has been incorporated into RWDI's proprietary software that allows, in many situations, for a qualitative, screening-level numerical estimation of pedestrian wind conditions without wind tunnel testing.The development site is currently a vacant lot. It is sheltered by existing buildings of similar height as the proposed Phase I and II
 around the site are expected to be comfortable for standing or sitting on an annual basis, with slightly windier conditions in the winter and spring seasons. These wind conditions meet the effective gust criterion and are considered comfortable for the intended use of sidewalks.
The proposed buildings in Phases I and II are similar in height to their immediate surroundings and they will not have any significant impact on and around the development site. Therefore, their resultant wind conditions will not be discussed in details.
The focus is on the 11 -story Phase III building, as it will intercept the prevailing winds and deflect them down to the exposed corners (Image $5 \mathrm{a})$. In addition, the gaps between the proposed and existing buildings, if aligned with the prevailing wind directions, will likely cause wind flow accelerations due to a channeling effect (Image 5b).
Image 6 on the next page highlights the flow patterns of northwest,
southwest and northeast winds around the proposed buildings
6
When winds are from a) northwest, b) southwest and c) northeast directions, they will accelerate around exposed building corners sбu!p!!nq pəsodoıd pue бu!̣s!xә әцł иәәмұәq sdeб́ цбิnoдчł pue
 around the Phases I and II buildings, the 11-story Phase III

 on windy days.

The Phase II building has a wide façade exposed to the northwest


 screens should be installed on both sides of the entrances to improve both wind conditions and door operability.

## Additional




Image 8 - Mitigation Examples of Landscaping, Screens, Parapets and Trellises

### 5.3. Phase III Building

## Building Entrances

 proposed 11-story Phase III building. Along the east façade, the

 in these covered and recessed area, suitable wind conditions are expected throughout the year.

The south façade will be attached to the existing MBTA Pump Station and the proposed Phase I Retail Building (Images 3a and 3b). The north façade is more exposed along Station Street, where increased wind activity is predicted. If feasible, main entrances to the Phase III building should not be located on the north façade.

There is an office lobby labeled in the recent design drawing


 of the elevated plaza, it will be more wind exposed. Wind control

 both sides of the entry/exit (Image 10).

## 



 gust criterion, but may be occasionally uncomfortable in the winter and spring seasons. Wind speeds at the northwest corner of the
 arge canopy along the west tower façade. The influence area of the strong winds around the northeast corner will be located on the railway track. These wind conditions may be considered acceptable, for this portion of Station Street is primarily for vehicular use.

## Elevated Plaza West of the Phase III Building

This area will be sheltered by the tower from the northeasterly
 deflected down by the 11-story tower onto the plaza, resulting in
 activities such as sitting in the summer.

If public use of the plaza is planned, tall, porous wind screens are recommended at the north and south ends of the plaza, and
 areas (see examples in Images 8 and 10).

If desired, wind tunnel testing can be conducted to quantify these wind conditions and, if needed, to develop wind control solutions.

## Courtyard between Phase I Buildings

After the construction of Phase III Building, increased wind activity is expected at the courtyard between Phase I buildings. This is due to the northwest and northeast buildings being re-directed down by the proposed office tower, as shown in Image 6.

The proposed wind mitigation measures in Images 7 and 8 include a tall, porous screen along the south end of the elevated plaza, and a tall parapet along the west roof edge of the Phase I retail building. These should be considered if lower wind activity is desired for the courtyard area.

## Summary <br> 6.

> Due to the limited height of the Phases I and II buildings, it is our opinion that these buildings will not cause any adverse wind impact on the surrounding area. The resultant wind conditions on and around the site are predicted to meet the BRA effective gust criterion throughout the year.

> The proposed Phase III building will be 11-stories in height and will cause localized wind flow accelerations. The resultant wind conditions are predicted to be appropriate for all grade areas, including building entrances, sidewalks and parking lots. No adverse wind impact is anticipated from the proposed development on the MBTA Station, the Southwest Corridor Park or adjacent public streets.

> If public use is planed for the rooftop area of the Phase I retail building and for the elevated plaza between Phases II and III buildings, wind mitigation measures should be developed in the form of landscaping, wind screens, tall parapets and trellises. Photo examples of wind mitigation have been provided for reference.

In the event of any significant changes to the design, construction or operation of the building or addition of surroundings in the future, RWDI could provide an assessment of their impact on the design considered in this report. It is the responsibility of others to contact RWDI to initiate this process.


## Appendix C - Air Quality appendix

# APPENDIX C AIR QUALITY 

## PARCEL 25 PROJECT NOTIFICATION FORM

Pages Contents<br>2-8 MOBILE6.2 Output for Garage and CAL3QHC Analyses<br>9-10 Garage Emissions Analysis Calculations - AM and PM Peak Hour<br>11-13 AERMOD Model Output<br>14-31 CAL3QHC Model Output<br>32-34 CAL3QHC Modeling Figures

```
*******************************************************************************
* MOBILE6.2.03 (24-Sep-2003)
*
* Input file: 3764_14W.INP (file 1, run 1). *
***************************************************************************
* *** Winter 2014
* Reading Registration Distributions from the following external
* data file: 2005_REG.D
M 49 Warning:
                    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.998 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.998 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.998 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.998 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    0.999 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
M 49 Warning:
    1.00 MYR sum not = 1. (will normalize)
* Reading I/M program description records from the following external
* data file: 09NEWIM.D
* 15 Year Exemption Age
* New Annual OBD Exhaust I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Exhaust I/M program for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
* New Annual OBD Evap I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Evap I/M program for for Light Duty and Medium duty MY 2008 and later <=14, 000 lb GVWR M601 Comment :
```

User has enabled STAGE II REFUELING.

* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

Reading User Supplied Tier2 Exhaust bin phase-in fractions

Data read from file: LEV2EXH.D

Reading User Supplied Tier2 EVAP phase-in fractions

Data read from file: LEV2EVAP.D

```
Reading User Supplied Tier2 50K certification standards
Data read from file: LEV2CERT.D
M616 Comment:
User has supplied post-1999 sulfur levels.
M614 Comment :
User supplied diesel sale fractions.
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2014 - Winter at 2.5 mph
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
M583 Warning:
            The user supplied arterial average speed of 2.5
            will be used for all hours of the day. 100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
M112 Warning:
                    Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
    data file: TECH12.D
M 48 Warning:
            there are no sales for vehicle class HDGV8b
HDDV DEFEAT DEVICE EFFECTS ARE PRESENT. THE REBUILD FRACTION IS 0.10.
LEV phase-in data read from file MA_LEV2.D
            Calendar Year: 2014
                    Month: Jan.
                    Altitude: Low
            Minimum Temperature: 22.8 (F)
            Maximum Temperature: 38.3 (F)
                Absolute Humidity: 75. grains/lb
            Fuel Sulfur Content: 30. ppm
            Exhaust I/M Program: Yes
                Evap I/M Program: Yes
                    ATP Program: No
                        Reformulated Gas: Yes
\begin{tabular}{rrrrrrrrrr} 
Vehicle Type: & LDGV & \begin{tabular}{rl} 
LDGT12 \\
GVWR:
\end{tabular} & & \(<6000\) & \(>6000\) & LDGT34 & LDGT & HDGV & LDDV \\
(All)
\end{tabular}
Composite Emission Factors (g/mi):
```




```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2014 - Winter at 25.0 mph
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
    M583 Warning:
```

            The user supplied arterial average speed of 25.0
            will be used for all hours of the day. \(100 \%\) of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
        M112 Warning:
            Wintertime Reformulated Gasoline Rules Apply
        M 48 Warning:
            there are no sales for vehicle class HDGV8b
    LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2014
Month: Jan.
Altitude: Low
Minimum Temperature: 22.8 (F)
Maximum Temperature: 38.3 (F)

```
            Absolute Humidity: 75. grains/lb
            Fuel Sulfur Content: 30. ppm
            Exhaust I/M Program: Yes
            Evap I/M Program: Yes
            ATP Program: No
            Reformulated Gas: Yes
* MOBILE6.2.03 (24-Sep-2003) *
* Input file: 3764_19W.INP (file 1, run 1). *
*******************************************************************************
* *** Winter 2019
* Reading Registration Distributions from the following external
* data file: 2005_REG.D
    M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.998 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.998 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.998 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.999 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.998 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            0.999 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
        M 49 Warning:
            1.00 MYR sum not = 1. (will normalize)
* Reading I/M program description records from the following external
* data file: 09NEWIM.D
```




* 15 Year Exemption Age
* New Annual OBD Exhaust I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Exhaust I/M program for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR
* New Annual OBD Evap I/M program for Light Duty MY 1996 through 2007 vehicles <=8,500 lb GVWR
* New Annual OBD Evap I/M program for for Light Duty and Medium duty MY 2008 and later <=14,000 lb GVWR M601 Comment :

User has enabled STAGE II REFUELING.

* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* data file: MA_LEV2.D

Reading User Supplied Tier2 Exhaust bin phase-in fractions

Data read from file: LEV2EXH.D

Reading User Supplied Tier2 EVAP phase-in fractions

Data read from file: LEV2EVAP.D

Reading User Supplied Tier2 50 K certification standards

Data read from file: LEV2CERT.D

M616 Comment:
User has supplied post-1999 sulfur levels.
M614 Comment:
User supplied diesel sale fractions.

* \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \#
* 2019 - Winter at 2.5 mph
* File 1, Run 1, Scenario 1.
* \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# \# M583 Warning:

The user supplied arterial average speed of 2.5
will be used for all hours of the day. $100 \%$ of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M112 Warning:
Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1\&2 vehicles were read from the following external data file: TECH12.D
M 48 Warning:
there are no sales for vehicle class HDGV8b
hDDV defeat device effects are present. the rebuild fraction is 0.10.

LEV phase-in data read from file MA_LEV2.D
Calendar Year: 2019
Month: Jan.
Altitude: Low
Minimum Temperature: 22.8 (F)
Maximum Temperature: 38.3 (F)
Absolute Humidity: 75. grains/lb
Fuel Sulfur Content: 30. ppm


PROJECT: PARCEL 25 PHASE II GARAGE PEAK AM HOUR - YEAR: 2014

DISTANCE IN:
DISTANCE OUT:

NUMBER OF EXIT LANES: 1 LANE (S)
TOTAL EXIT VOLUME:
CO RATE: 14.82 GRAMS CO/MILE

SPEED IN GARAGE:
VENT CFM: 24,000 CFM

TOTAL CO EMISSIONS =
1.267 GRAMS/MIN = 0.0211 GRAMS/SEC TOTAL VENTILATION = 680 CU. M/MIN

PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 1.63 PPM

PROJECT: PARCEL 25 PHASE II GARAGE PEAK PM HOUR - YEAR: 2014

DISTANCE IN:
DISTANCE OUT:

NUMBER OF EXIT LANES: TOTAL EXIT VOLUME:

CO RATE: $\quad 14.82$ GRAMS CO/MILE
SPEED IN GARAGE:

VENT CFM: 24,000 CFM

TOTAL CO EMISSIONS = 1.308 GRAMS/MIN = 0.0218 GRAMS/SEC TOTAL VENTILATION = 680 CU. M/MIN

```
PROJECT: PARCEL 25 PHASE III GARAGE PEAK AM HOUR - YEAR: 2014
DISTANCE IN:
128.0 METERS
DISTANCE OUT: 128.0 METERS
NUMBER OF EXIT LANES: }1\mathrm{ LANE(S)
TOTAL EXIT VOLUME:
90 VEH/HOUR
    CO RATE: 14.82 GRAMS CO/MILE
SPEED IN GARAGE:
5.0 M.P.H.
VENT CFM: 87,600 CFM
TOTAL CO EMISSIONS = 5.274 GRAMS/MIN = 0.0879 GRAMS/SEC
TOTAL VENTILATION = 2,481 CU. M/MIN
    PEAK 1-HOUR CO CONCENTRATION FROM VEHICLES: 1.85 PPM
```

PROJECT: PARCEL 25 PHASE IIi GARAGE PEAK PM HOUR - YEAR: 2014

DISTANCE IN:
DISTANCE OUT:

NUMBER OF EXIT LANES: 1 LANE(S) TOTAL EXIT VOLUME:

CO RATE: 14.82 GRAMS CO/MILE

SPEED IN GARAGE:

VENT CFM: 87,600 CFM

TOTAL CO EMISSIONS $=5.388$ GRAMS/MIN $=0.0898$ GRAMS/SEC TOTAL VENTILATION $=2,481 \mathrm{CU} . \mathrm{M} / \mathrm{MIN}$
128.0 METERS
128.0 METERS

92 VEH/HOUR
5.0 M.P.H.

${ }^{2}$ **MODELOPTS: NonDFAULT CONC FLAT NOCHKD


```
\(\begin{array}{lllllllllllllllllllllllllllllllllllllllllllllllllll}1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1\end{array}\)
```



``` \(\begin{array}{llllllllllllllll}1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1\end{array}\)
```

note: meteorological data actually processed will also depend on what is included in the data file.



JOB: PARCEL 25 - TREMONT/MALCOLM X RUN: 2014 EXISTING PEAK AM
DATE: 05/28/14 TIME: 16:38
The MODE flag has been set to $C$ for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


JOB: PARCEL 25 - TREMONT/MALCOLM X RUN: 2014 EXISTING PEAK AM
DATE: 05/28/14 TIME: 16:38
ADDITIONAL QUEUE LINK PARAMETERS

| LINK DESCRIPTION | * | $\begin{aligned} & \text { CYCLE } \\ & \text { LENGTH } \\ & (\text { SEC }) \end{aligned}$ | RED <br> TIME (SEC) | CLEARANCE <br> LOST TIME <br> (SEC) | $\begin{aligned} & \text { APPROACH } \\ & \text { VOL } \\ & (\text { VPH }) \end{aligned}$ | SATURATION FLOW RATE (VPH) | $\begin{gathered} \text { IDLE } \\ \text { EM FAC } \\ (\mathrm{gm} / \mathrm{hr}) \end{gathered}$ | SIGNAL TYPE | ARRIVAL RATE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. EB L/T/R QUEUE | * | 140 | 105 | 4.0 | 621 | 1900 | 41.95 | 2 | 3 |
| 2. WB L/T QUEUE |  | 140 | 116 | 4.0 | 508 | 1900 | 41.95 | 2 | 3 |
| 4. NB U/L QUEUE |  | 140 | 125 | 4.0 | 177 | 1900 | 41.95 | 2 | 3 |
| 5. NB T/R QUEUE | * | 140 | 104 | 4.0 | 1448 | 1900 | 41.95 | 2 | 3 |
| 6. SB U/L QUEUE | * | 140 | 125 | 4.0 | 145 | 1900 | 41.95 | 2 | 3 |
| 7. SB T/R QUEUE | * | 140 | 104 | 4.0 | 722 | 1900 | 41.95 | 2 | 3 |

RECEPTOR LOCATIONS

|  | * | COORDINATES (FT) |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| RECEPTOR | * | X | Y | Z |  |
| 1. 1 | * | 765523.5 | ******* | 5.9 | * |
| 2. 2 | * | 765616.0 | ******** | 5.9 | * |
| 3. 3 | * | 765717.2 | ******** | 5.9 | * |
| 4. 4 | * | 765684.7 | ******** | 5.9 | * |
| 5. 5 | * | 765646.5 | ***** | 5.9 | * |
| 6. 6 | * | 765747.1 | ******** | 5.9 | * |
| 7. 7 | * | 765794.4 | ***** | 5.9 | * |
| 8. 8 | * | 765849.6 | ** | 5.9 | * |
| 9. 9 | * | 765946.9 | ******** | 5.9 | * |
| 10. 10 | * | 766080.4 | **** | 5.9 | * |
| 11. 11 | * | 766094.6 | ******** | 5.9 | * |
| 12. 12 | * | 765907.0 | ** | 5.9 | * |
| 13. 13 | * | 765955.7 | ** | 5.9 | * |
| 14. 14 | * | 765955.1 | ******** | 5.9 | * |
| 15. 15 | * | 765999.4 | ******* | 5.9 | * |
| 16. 16 | * | 765910.3 | ******* | 5.9 | * |
| 17. 17 | * | 765862.2 | ***** | 5.9 | * |
| 18. 18 | * | 765780.7 | ******** | 5.9 | * |
| 19. 19 | * | 765663.3 | ******* | 5.9 | * |
| 20. 20 | * | 765562.1 | * | 5.9 | * |

RUN: 2014 EXISTING PEAK AM
PAGE 3

## MODEL RESULTS

$$
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
$$

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 2.80 PPM OCCURRED AT RECEPTOR REC8 .
JOB: PARCEL 25 - TREMONT/MALCOLM X $\quad$ RUN: 2019 FULL BUILD PEAK AM
DATE: $05 / 28 / 14$ TIME: $16: 39$

The MODE flag has been set to $C$ for calculating $C 0$ averages.
SITE \& METEOROLOGICAL VARIABLES

JOB: PARCEL 25 - TREMONT/MALCOLM X RUN: 2019 FULL BUILD PEAK AM DATE: 05/28/14 TIME: 16:39


| ADDITIONAL QUEUE LINK PARAMETERS |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LINK DESCRIPTION | * | CYCLE LENGTH (SEC) | RED <br> TIME <br> (SEC) | CLEARANCE LOST TIME (SEC) | $\begin{aligned} & \text { APPROACH } \\ & \text { VOL } \\ & (\text { VPH }) \end{aligned}$ | SATURATION FLOW RATE (VPH) | $\begin{gathered} \text { IDLE } \\ \text { EM FAC } \\ (\mathrm{gm} / \mathrm{hr}) \end{gathered}$ | SIGNAL TYPE | ARRIVAL RATE |
| 1. EB L/T/R QUEUE | * | 140 | 105 | 4.0 | 694 | 1900 | 37.77 | 2 | 3 |
| 2. WB L/T QUEUE | * | 140 | 116 | 4.0 | 532 | 1900 | 37.77 | 2 | 3 |
| 4. NB U/L QUEUE | * | 140 | 125 | 4.0 | 195 | 1900 | 37.77 | 2 | 3 |
| 5. NB T/R QUEUE | * | 140 | 104 | 4.0 | 1534 | 1900 | 37.77 | 2 | 3 |
| 6. SB U/L QUEUE | * | 140 | 125 | 4.0 | 156 | 1900 | 37.77 | 2 | 3 |
| 7. SB T/R QUEUE | * | 140 | 104 | 4.0 | 775 | 1900 | 37.77 | 2 | 3 |
| RECEPTOR LOCATIONS |  |  |  |  |  |  |  |  |  |
|  | * | COORDINATES (FT) |  |  | * |  |  |  |  |
| RECEPTOR | * | X | Y | Z | * |  |  |  |  |
| 1. 1 | * | 765523.5 | *** | ** | 5.9 * |  |  |  |  |
| 2. 2 | * | 765616.0 | ** |  | 5.9 |  |  |  |  |
| 3. 3 | * | 765717.2 | **** | ** | 5.9 |  |  |  |  |
| 4. 4 | * | 765684.7 | ** |  | 5.9 |  |  |  |  |
| 5. 5 | * | 765646.5 | **** |  | 5.9 |  |  |  |  |
| 6. 6 | * | 765747.1 | *** |  | 5.9 |  |  |  |  |
| 7. 7 | * | 765794.4 | **** |  | 5.9 |  |  |  |  |
| 8. 8 | * | 765849.6 | ** |  | 5.9 |  |  |  |  |
| 9. 9 | * | 765946.9 | **** |  | 5.9 |  |  |  |  |
| 10. 10 | * | 766080.4 | *** |  | 5.9 |  |  |  |  |
| 11. 11 | * | 766094.6 | ** |  | 5.9 |  |  |  |  |
| 12. 12 | * | 765907.0 | **** |  | 5.9 |  |  |  |  |
| 13. 13 | * | 765955.7 | **** |  | 5.9 |  |  |  |  |
| 14. 14 | * | 765955.1 | **** |  | 5.9 |  |  |  |  |
| 15. 15 | * | 765999.4 | *** |  | 5.9 |  |  |  |  |
| 16. 16 | * | 765910.3 | **** |  | 5.9 * |  |  |  |  |
| 17. 17 | * | 765862.2 | ** |  | 5.9 |  |  |  |  |
| 18. 18 | * | 765780.7 | **** |  | 5.9 |  |  |  |  |
| 19. 19 | * | 765663.3 | **** |  | 5.9 |  |  |  |  |
| 20. 20 | * | 765562.1 | *** | ** | 5.9 |  |  |  |  |

RUN: 2019 FULL BUILD PEAK AM
PAGE 4

## MODEL RESULTS

$$
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
$$

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 2.70 PPM OCCURRED AT RECEPTOR REC8 .
JOB: PARCEL 25 - TREMONT/MALCOLM X RUN: 2019 NO BUILD PEAK AM
DATE: $05 / 28 / 14$ TIME: $16: 39$

The MODE flag has been set to $C$ for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES

| $\begin{aligned} \mathrm{VS} & =0.0 \mathrm{CM} / \mathrm{S} \\ \mathrm{U} & =1.0 \mathrm{M} / \mathrm{S} \end{aligned}$ | $\begin{aligned} & \text { VD }=\quad 0.0 \\ & \text { CLAS }=\quad 4 \end{aligned}$ | CM/S <br> (D) | $\begin{array}{r} \mathrm{Z0}= \\ \text { ATIM }= \end{array}$ | $\begin{array}{r} 321 . \\ 60 . \end{array}$ | CM <br> MINUTES |  | XH = 10 | 000. M | $=$ | . 0 PPM |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LINK VARIABLES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| LINK DESCRIPTION | X1 | LINK C Y1 | COORDINATES <br> 1 X2 | (FT) | Y2 | * | $\begin{gathered} \text { LENGTH } \\ (\mathrm{FT}) \end{gathered}$ | $\begin{aligned} & \text { BRG TYPE } \\ & (\mathrm{DEG}) \end{aligned}$ | VPH | $\begin{gathered} \mathrm{EF} \\ (\mathrm{G} / \mathrm{MI}) \end{gathered}$ | $\begin{gathered} \mathrm{H} \\ (\mathrm{FT}) \end{gathered}$ | $\begin{gathered} W \\ (\mathrm{FT}) \end{gathered}$ | V/C | QUEUE <br> (VEH) |

JOB: PARCEL 25 - TREMONT/MALCOLM X RUN: 2019 NO BUILD PEAK AM DATE: 05/28/14 TIME: 16:39


ADDITIONAL QUEUE LINK PARAMETERS

| LINK DESCRIPTION | * | CYCLE LENGTH <br> (SEC) | RED <br> TIME (SEC) | CLEARANCE LOST TIME (SEC) | $\begin{aligned} & \text { APPROACH } \\ & \text { VOL } \\ & (\text { VPH }) \end{aligned}$ | SATURATION FLOW RATE (VPH) | $\begin{gathered} \text { IDLE } \\ \text { EM FAC } \\ (\mathrm{gm} / \mathrm{hr}) \end{gathered}$ | SIGNAL <br> TYPE | ARRIVAL RATE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. EB L/T/R QUEUE | * | 140 | 105 | 4.0 | 694 | 1900 | 37.77 | 2 | 3 |
| 2. WB L/T QUEUE | * | 140 | 116 | 4.0 | 520 | 1900 | 37.77 | 2 | 3 |
| 4. NB U/L QUEUE | * | 140 | 125 | 4.0 | 182 | 1900 | 37.77 | 2 | 3 |
| 5. NB T/R QUEUE | * | 140 | 104 | 4.0 | 1534 | 1900 | 37.77 | 2 | 3 |
| 6. SB U/L QUEUE | * | 140 | 125 | 4.0 | 153 | 1900 | 37.77 | 2 | 3 |
| 7. SB T/R QUEUE | * | 140 | 104 | 4.0 | 774 | 1900 | 37.77 | 2 | 3 |
| RECEPTOR LOCATIONS |  |  |  |  |  |  |  |  |  |
|  | * | COORDINATES (FT) |  |  | * |  |  |  |  |
| RECEPTOR | * | X | Y | Z | * |  |  |  |  |
| 1. 1 | * | 765523.5 | ** | ** | 5.9 |  |  |  |  |
| 2. 2 | * | 765616.0 | *** |  | 5.9 |  |  |  |  |
| 3. 3 | * | 765717.2 | *** | ** | 5.9 |  |  |  |  |
| 4. 4 | * | 765684.7 | *** |  | 5.9 |  |  |  |  |
| 5. 5 | * | 765646.5 | *** | ** | 5.9 |  |  |  |  |
| 6. 6 | * | 765747.1 | *** |  | 5.9 |  |  |  |  |
| 7. 7 | * | 765794.4 | *** | *** | 5.9 |  |  |  |  |
| 8. 8 | * | 765849.6 | *** |  | 5.9 |  |  |  |  |
| 9. 9 | * | 765946.9 | *** | ** | 5.9 |  |  |  |  |
| 10. 10 | * | 766080.4 | *** |  | 5.9 |  |  |  |  |
| 11. 11 | * | 766094.6 | *** | ** | 5.9 |  |  |  |  |
| 12. 12 | * | 765907.0 | *** |  | 5.9 |  |  |  |  |
| 13. 13 | * | 765955.7 | *** | *** | 5.9 |  |  |  |  |
| 14. 14 | * | 765955.1 | *** | ** | 5.9 |  |  |  |  |
| 15. 15 | * | 765999.4 | ** | ** | 5.9 |  |  |  |  |
| 16. 16 | * | 765910.3 | *** | ** | 5.9 |  |  |  |  |
| 17. 17 | * | 765862.2 | * |  | 5.9 |  |  |  |  |
| 18. 18 | * | 765780.7 | *** | ** | 5.9 |  |  |  |  |
| 19. 19 | * | 765663.3 | ** | *** | 5.9 |  |  |  |  |
| 20. 20 | * | 765562.1 | *** | *** | 5.9 |  |  |  |  |

RUN: 2019 NO BUILD PEAK AM
PAGE 4

## MODEL RESULTS

$$
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
$$

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 2.70 PPM OCCURRED AT RECEPTOR REC8 .

```
JOB: PARCEL 25 - TREMONT/GURNEY
DATE: 05/28/14 TIME: 16:39

The MODE flag has been set to \(C\) for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


ADDITIONAL QUEUE LINK PARAMETERS
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline LINK DESCRIPTION & * & CYCLE LENGTH (SEC) & \begin{tabular}{l}
RED \\
TIME (SEC)
\end{tabular} & CLEARANCE LOST TIME (SEC) & \[
\begin{aligned}
& \text { APPROACH } \\
& \text { VOL } \\
& (\text { VPH })
\end{aligned}
\] & SATURATION FLOW RATE (VPH) & \[
\begin{gathered}
\text { IDLE } \\
\text { EM FAC } \\
(\mathrm{gm} / \mathrm{hr})
\end{gathered}
\] & \begin{tabular}{l}
SIGNAL \\
TYPE
\end{tabular} & ARRIVAL RATE \\
\hline 1. EB L/T/R QUEUE & * & 80 & 34 & 4.0 & 689 & 1900 & 41.95 & 2 & 3 \\
\hline 2. WB L/T/R QUEUE & & 80 & 34 & 4.0 & 845 & 1900 & 41.95 & 2 & 3 \\
\hline 3. NB L/T/R QUEUE & * & 80 & 54 & 4.0 & 446 & 1900 & 41.95 & 2 & 3 \\
\hline \multicolumn{10}{|l|}{RECEPTOR LOCATIONS} \\
\hline & * & & ORDIN & S (FT) & * & & & & \\
\hline RECEPTOR & * & X & Y & Z & * & & & & \\
\hline 1. 1 & * & 765224.8 & ** & ** & 5.9 & & & & \\
\hline 2. 2 & * & 765282.6 & *** & & 5.9 & & & & \\
\hline 3. 3 & * & 765343.0 & *** & ** & 5.9 & & & & \\
\hline 4. 4 & * & 765332.4 & *** & & 5.9 & & & & \\
\hline 5. 5 & * & 765318.5 & *** & ** & 5.9 & & & & \\
\hline 6. 6 & * & 765351.4 & *** & & 5.9 & & & & \\
\hline 7. 7 & * & 765364.1 & *** & ** & 5.9 & & & & \\
\hline 8. 8 & * & 765380.1 & *** & & 5.9 & & & & \\
\hline 9. 9 & * & 765452.0 & ** & & 5.9 & & & & \\
\hline 10. 10 & * & 765533.4 & *** & & 5.9 & & & & \\
\hline 11. 11 & * & 765556.8 & *** & & 5.9 & & & & \\
\hline 12. 12 & * & 765478.6 & *** & ** & 5.9 & & & & \\
\hline 13. 13 & * & 765402.6 & ** & ** & 5.9 & & & & \\
\hline 14. 14 & * & 765409.6 & *** & ** & 5.9 & & & & \\
\hline 15. 15 & * & 765418.7 & *** & * & 5.9 & & & & \\
\hline 16. 16 & * & 765387.2 & ** & ** & 5.9 & & & & \\
\hline 17. 17 & * & 765374.9 & *** & & 5.9 & & & & \\
\hline 18. 18 & * & 765362.9 & *** & * & 5.9 & & & & \\
\hline 19. 19 & * & 765293.4 & *** & & 5.9 & & & & \\
\hline 20. 20 & * & 765239.7 & *** & * & 5.9 & & & & \\
\hline
\end{tabular}

RUN: 2014 EXISTING PEAK AM
PAGE 4

\section*{MODEL RESULTS}
\[
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
\]

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.70 PPM OCCURRED AT RECEPTOR REC8 .
```

JOB: PARCEL 25 - TREMONT/GURNEY RUN: 2019 NO BUILD PEAK AM
DATE: 05/28/14 TIME: 16:40

The MODE flag has been set to $C$ for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


ADDITIONAL QUEUE LINK PARAMETERS

| LINK DESCRIPTION | * | CYCLE LENGTH (SEC) | RED TIME (SEC) | CLEARANCE LOST TIME (SEC) | APPROACH VOL <br> (VPH) | SATURATION FLOW RATE (VPH) | $\begin{gathered} \text { IDLE } \\ \text { EM FAC } \\ (\mathrm{gm} / \mathrm{hr}) \end{gathered}$ | SIGNAL <br> TYPE | ARRIVAL RATE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. EB L/T/R QUEUE | * | 140 | 66 | 4.0 | 766 | 1900 | 37.77 | 2 | 3 |
| 2. WB L/T/R QUEUE | * | 140 | 66 | 4.0 | 883 | 1900 | 37.77 | 2 | 3 |
| 3. NB L/T/R QUEUE | * | 140 | 82 | 4.0 | 456 | 1900 | 37.77 | 2 | 3 |
| RECEPTOR LOCATIONS |  |  |  |  |  |  |  |  |  |
|  | * | COORDINATES (FT) |  |  | * |  |  |  |  |
| RECEPTOR | * | X | Y | Z | * |  |  |  |  |
| 1. 1 | * | 765224.8 | ** | ** | 5.9 |  |  |  |  |
| 2. 2 | * | 765282.6 | *** |  | 5.9 |  |  |  |  |
| 3. 3 | * | 765343.0 | *** | ** | 5.9 |  |  |  |  |
| 4. 4 | * | 765332.4 | *** |  | 5.9 |  |  |  |  |
| 5. 5 | * | 765318.5 | *** | ** | 5.9 |  |  |  |  |
| 6. 6 | * | 765351.4 | *** | *** | 5.9 |  |  |  |  |
| 7. 7 | * | 765364.1 | ** | ** | 5.9 |  |  |  |  |
| 8. 8 | * | 765380.1 | *** |  | 5.9 |  |  |  |  |
| 9. 9 | * | 765452.0 | ** | ** | 5.9 |  |  |  |  |
| 10. 10 | * | 765533.4 | ** | * | 5.9 |  |  |  |  |
| 11. 11 | * | 765556.8 | ** | * | 5.9 |  |  |  |  |
| 12. 12 | * | 765478.6 | * | * | 5.9 |  |  |  |  |
| 13. 13 | * | 765402.6 | ** | ** | 5.9 |  |  |  |  |
| 14. 14 | * | 765409.6 | *** | *** | 5.9 |  |  |  |  |
| 15. 15 | * | 765418.7 | *** | * | 5.9 |  |  |  |  |
| 16. 16 | * | 765387.2 | ** | ** | 5.9 |  |  |  |  |
| 17. 17 | * | 765374.9 | *** |  | 5.9 |  |  |  |  |
| 18. 18 | * | 765362.9 | ** | ** | 5.9 |  |  |  |  |
| 19. 19 | * | 765293.4 | ** | ** | 5.9 |  |  |  |  |
| 20. 20 | * | 765239.7 | *** | * | 5.9 |  |  |  |  |

RUN: 2019 NO BUILD PEAK AM
PAGE 4

## MODEL RESULTS

$$
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
$$

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.70 PPM OCCURRED AT RECEPTOR REC8 .

```
JOB: PARCEL 25 - TREMONT/GURNEY
DATE: 05/28/14 TIME: 16:40

The MODE flag has been set to \(C\) for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


ADDITIONAL QUEUE LINK PARAMETERS
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline LINK DESCRIPTION & * & CYCLE LENGTH (SEC) & RED TIME (SEC) & \begin{tabular}{l}
CLEARANCE \\
LOST TIME (SEC)
\end{tabular} & \[
\begin{aligned}
& \text { APPROACH } \\
& \text { VOL } \\
& (\text { VPH })
\end{aligned}
\] & SATURATION FLOW RATE (VPH) & \[
\begin{gathered}
\text { IDLE } \\
\text { EM FAC } \\
(\mathrm{gm} / \mathrm{hr})
\end{gathered}
\] & SIGNAL TYPE & ARRIVAL RATE \\
\hline 1. EB L/T/R QUEUE & * & 140 & 66 & 4.0 & 805 & 1900 & 37.77 & 2 & 3 \\
\hline 2. WB L/T/R QUEUE & & 140 & 66 & 4.0 & 915 & 1900 & 37.77 & 2 & 3 \\
\hline 3. NB L/T/R QUEUE & & 140 & 82 & 4.0 & 482 & 1900 & 37.77 & 2 & 3 \\
\hline \multicolumn{10}{|l|}{RECEPTOR LOCATIONS} \\
\hline & * & \multicolumn{3}{|r|}{COORDINATES (FT)} & * & & & & \\
\hline RECEPTOR & * & X & Y & Z & * & & & & \\
\hline 1. 1 & * & 765224.8 & *** & & 5.9 & & & & \\
\hline 2. 2 & * & 765282.6 & *** & & 5.9 & & & & \\
\hline 3. 3 & * & 765343.0 & ** & ** & 5.9 & & & & \\
\hline 4. 4 & * & 765332.4 & *** & & 5.9 & & & & \\
\hline 5. 5 & * & 765318.5 & ** & ** & 5.9 & & & & \\
\hline 6. 6 & * & 765351.4 & ** & & 5.9 & & & & \\
\hline 7. 7 & * & 765364.1 & *** & ** & 5.9 & & & & \\
\hline 8. 8 & * & 765380.1 & *** & & 5.9 & & & & \\
\hline 9. 9 & * & 765452.0 & ** & ** & 5.9 & & & & \\
\hline 10. 10 & * & 765533.4 & *** & & 5.9 & & & & \\
\hline 11. 11 & * & 765556.8 & ** & ** & 5.9 & & & & \\
\hline 12. 12 & * & 765478.6 & *** & & 5.9 & & & & \\
\hline 13. 13 & * & 765402.6 & ** & ** & 5.9 & & & & \\
\hline 14. 14 & * & 765409.6 & *** & ** & 5.9 & & & & \\
\hline 15. 15 & * & 765418.7 & ** & ** & 5.9 & & & & \\
\hline 16. 16 & * & 765387.2 & ** & & 5.9 & & & & \\
\hline 17. 17 & * & 765374.9 & ** & & 5.9 & & & & \\
\hline 18. 18 & * & 765362.9 & ** & & 5.9 & & & & \\
\hline 19. 19 & * & 765293.4 & ** & & 5.9 & & & & \\
\hline 20. 20 & * & 765239.7 & *** & & 5.9 & & & & \\
\hline
\end{tabular}

RUN: 2019 FULL BUILD PEAK AM
PAGE 4

\section*{MODEL RESULTS}
\[
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
\]

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.70 PPM OCCURRED AT RECEPTOR REC8 .
```

JOB: PARCEL 25 - TREMONT/PARKER
RUN: 2014 EXISTING PEAK AM
DATE: 05/28/14 TIME: 16:40

```

The MODE flag has been set to \(C\) for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


ADDITIONAL QUEUE LINK PARAMETERS


RUN: 2014 EXISTING PEAK AM
PAGE 4

\section*{MODEL RESULTS}
\[
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
\]

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.60 PPM OCCURRED AT RECEPTOR REC18.
JOB: PARCEL 25 - TREMONT/PARKER
DATE: \(05 / 28 / 14\) TIME: \(16: 41\)

The MODE flag has been set to \(C\) for calculating CO averages.
SITE \& METEOROLOGICAL VARIABLES


ADDITIONAL QUEUE LINK PARAMETERS
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|}
\hline LINK DESCRIPTION & * & CYCLE LENGTH (SEC) & \begin{tabular}{l}
RED \\
TIME \\
(SEC)
\end{tabular} & CLEARANCE LOST TIME (SEC) & \[
\begin{aligned}
& \text { APPROACH } \\
& \text { VOL } \\
& (\text { VPH })
\end{aligned}
\] & SATURATION FLOW RATE (VPH) & \[
\begin{gathered}
\text { IDLE } \\
\text { EM FAC } \\
(\mathrm{gm} / \mathrm{hr})
\end{gathered}
\] & SIGNAL TYPE & ARRIVAL RATE \\
\hline 1. EB L/T/R QUEUE & * & 140 & 42 & 4.0 & 660 & 1900 & 37.77 & 2 & 3 \\
\hline 2. WB L/T/R QUEUE & & 140 & 42 & 4.0 & 861 & 1900 & 37.77 & 2 & 3 \\
\hline 3. SB L/T/R QUEUE & * & 140 & 106 & 4.0 & 337 & 1900 & 37.77 & 2 & 3 \\
\hline \multicolumn{10}{|l|}{RECEPTOR LOCATIONS} \\
\hline & * & & ORDIN & S (FT) & * & & & & \\
\hline RECEPTOR & * & X & Y & Z & * & & & & \\
\hline 1. 1 & * & 764915.0 & ** & & 5.9 & & & & \\
\hline 2. 2 & * & 764984.0 & *** & & 5.9 & & & & \\
\hline 3. 3 & * & 765062.2 & *** & ** & 5.9 & & & & \\
\hline 4. 4 & * & 765047.4 & *** & & 5.9 & & & & \\
\hline 5. 5 & * & 765030.3 & *** & ** & 5.9 & & & & \\
\hline 6. 6 & * & 765053.7 & *** & & 5.9 & & & & \\
\hline 7. 7 & * & 765076.6 & *** & ** & 5.9 & & & & \\
\hline 8. 8 & * & 765095.4 & *** & & 5.9 & & & & \\
\hline 9. 9 & * & 765183.9 & ** & & 5.9 & & & & \\
\hline 10. 10 & * & 765276.0 & *** & & 5.9 & & & & \\
\hline 11. 11 & * & 765289.0 & *** & & 5.9 & & & & \\
\hline 12. 12 & * & 765232.5 & *** & ** & 5.9 & & & & \\
\hline 13. 13 & * & 765170.1 & ** & ** & 5.9 & & & & \\
\hline 14. 14 & * & 765187.8 & *** & ** & 5.9 & & & & \\
\hline 15. 15 & * & 765219.9 & *** & * & 5.9 & & & & \\
\hline 16. 16 & * & 765180.9 & * & ** & 5.9 & & & & \\
\hline 17. 17 & * & 765138.9 & *** & & 5.9 & & & & \\
\hline 18. 18 & * & 765100.1 & ** & ** & 5.9 & & & & \\
\hline 19. 19 & * & 765028.5 & *** & & 5.9 & & & & \\
\hline 20. 20 & * & 764937.9 & *** & * & 5.9 & & & & \\
\hline
\end{tabular}

\section*{MODEL RESULTS}
\[
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
\]

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.60 PPM OCCURRED AT RECEPTOR REC18.
CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221
PAGE 1


RUN: 2019 FULL BUILD PEAK AM
DATE: 05/28/14 TIME: 16:41
The MODE flag has been set to \(C\) for calculating CO averages.



RUN: 2019 FULL BUILD PEAK AM
PAGE 4

\section*{MODEL RESULTS}
\[
\begin{aligned}
\text { REMARKS : } & \text { In search of the angle corresponding to } \\
& \text { the maximum concentration, only the first } \\
& \text { angle, of the angles with same maximum } \\
& \text { concentrations, is indicated as maximum. }
\end{aligned}
\]

WIND ANGLE RANGE: 0.-360.


THE HIGHEST CONCENTRATION OF 0.60 PPM OCCURRED AT RECEPTOR REC18.


Figure 1
Tremont Street at Columbus Avenue/Malcolm X Boulevard Existing and Future No Build \& Full Build Conditions Roadway Links and Receptors

тесн environmental facuisen arow inges. neal solutions.


Figure 2

Tremont Street at Terrace Street/Gurney Street
Existing and Future No Build \& Full Build Conditions
Roadway Links and Receptors
e| Tech environmentat focuseo knowledge. real salutions.


Figure 3

Tremont Street/Parker Street
Existing and Future No Build \& Full Build Conditions
Roadway Links and Receptors

тесн environmental FOCUSED SNOWLEDGE. REAL SDLUTIONS.



\title{
APPENDIX D NOISE APPENDIX
}

\section*{PARCEL 25 PROJECT NOTIFICATION FORM}

\section*{Page Contents}

2 Figure 1: Modeling Receptor Locations
3 Cadna Noise Modeling Results


\section*{\(\begin{array}{llll} & & & \\ 0 & 50 & 100 & 200\end{array}\)}

Figure 1
Sound Monitoring Locations
and Modeling Receptors
For Parcel 25 and Parcel 25B

Boston, MA

\section*{Cadna Noise Modeling Results}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Name & ID & Sound & \multicolumn{9}{|c|}{Octave Band Levels} & Height \\
\hline & & Level & 31 & 63 & 125 & 250 & 500 & 1000 & 2000 & 4000 & 8000 & \\
\hline & & (dBA) & (dB) & (dB) & (dB) & (dB) & (dB) & (dB) & (dB) & (dB) & (dB) & (m) \\
\hline Children's Learning Center - Daycare & 1424_Tremont & 37.9 & 52 & 52 & 47 & 42 & 34 & 30 & 22 & 17 & 7 & 1.52 \\
\hline 1430 Tremont & 1st_Floor & 38.3 & 52 & 52 & 47 & 43 & 35 & 30 & 22 & 15 & 3 & 1.52 \\
\hline 1430 Tremont & 3rd_Floor & 41.3 & 53 & 53 & 49 & 46 & 38 & 33 & 27 & 18 & 5 & 7.62 \\
\hline 1431 Tremont & 1st_Floor & 41.2 & 53 & 53 & 49 & 46 & 38 & 32 & 26 & 20 & 8 & 1.52 \\
\hline 1431 Tremont & 3rd_Floor & 44.6 & 54 & 55 & 51 & 49 & 42 & 37 & 33 & 26 & 14 & 7.62 \\
\hline 673 Parker & 1st_Floor & 42.7 & 51 & 52 & 49 & 47 & 40 & 35 & 28 & 20 & 3 & 1.52 \\
\hline 673 Parker & 3rd_Floor & 45.9 & 52 & 53 & 51 & 50 & 44 & 40 & 32 & 26 & 10 & 7.62 \\
\hline 675 Parker & 1st_Floor & 43.7 & 51 & 53 & 50 & 48 & 41 & 36 & 30 & 24 & 7 & 1.52 \\
\hline 675 Parker & 3rd_Floor & 45.7 & 52 & 53 & 51 & 49 & 44 & 39 & 32 & 27 & 10 & 7.62 \\
\hline
\end{tabular}


\section*{Appendix E - Transportation Appendix}

\section*{TRANSPORTATION TECHNICAL APPENDIX}
- TRAFFIC COUNTS
- INTERSECTION CAPACITY ANALYSIS WORKSHEETS
- TRIP GENERATION CALCULATIONS

\section*{TRAFFIC COUNTS}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

File Name : 123066 A
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

\section*{Groups Printed- Cars - Heavy Vehicles}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 25 & 93 & 18 & 1 & 67 & 64 & 20 & 0 & 21 & 291 & 39 & 1 & 19 & 85 & 44 & 0 & 788 \\
\hline 07:15 AM & 40 & 114 & 29 & 1 & 99 & 89 & 15 & 0 & 19 & 255 & 37 & 1 & 10 & 65 & 43 & 0 & 817 \\
\hline 07:30 AM & 39 & 124 & 23 & 3 & 120 & 101 & 13 & 0 & 13 & 328 & 33 & 2 & 17 & 59 & 44 & 0 & 919 \\
\hline 07:45 AM & 27 & 125 & 33 & 2 & 108 & 72 & 16 & 0 & 8 & 272 & 39 & 0 & 25 & 67 & 55 & 0 & 849 \\
\hline Total & 131 & 456 & 103 & 7 & 394 & 326 & 64 & 0 & 61 & 1146 & 148 & 4 & 71 & 276 & 186 & 0 & 3373 \\
\hline 08:00 AM & 37 & 135 & 28 & 2 & 92 & 98 & 11 & 0 & 13 & 255 & 26 & 0 & 24 & 59 & 59 & 0 & 839 \\
\hline 08:15 AM & 40 & 119 & 19 & 0 & 105 & 80 & 11 & 0 & 11 & 360 & 39 & 0 & 20 & 55 & 38 & 0 & 897 \\
\hline 08:30 AM & 37 & 103 & 23 & 4 & 88 & 69 & 14 & 0 & 10 & 255 & 33 & 0 & 19 & 59 & 37 & 0 & 751 \\
\hline 08:45 AM & 37 & 115 & 31 & 0 & 86 & 83 & 20 & 0 & 15 & 284 & 33 & 0 & 25 & 60 & 29 & 0 & 818 \\
\hline Total & 151 & 472 & 101 & 6 & 371 & 330 & 56 & 0 & 49 & 1154 & 131 & 0 & 88 & 233 & 163 & 0 & 3305 \\
\hline Grand Total & 282 & 928 & 204 & 13 & 765 & 656 & 120 & 0 & 110 & 2300 & 279 & 4 & 159 & 509 & 349 & 0 & 6678 \\
\hline Apprch \% & 19.8 & 65 & 14.3 & 0.9 & 49.6 & 42.6 & 7.8 & 0 & 4.1 & 85.4 & 10.4 & 0.1 & 15.6 & 50 & 34.3 & 0 & \\
\hline Total \% & 4.2 & 13.9 & 3.1 & 0.2 & 11.5 & 9.8 & 1.8 & 0 & 1.6 & 34.4 & 4.2 & 0.1 & 2.4 & 7.6 & 5.2 & 0 & \\
\hline Cars & 264 & 858 & 116 & 13 & 655 & 586 & 107 & 0 & 105 & 2193 & 266 & 4 & 149 & 473 & 335 & 0 & 6124 \\
\hline \% Cars & 93.6 & 92.5 & 56.9 & 100 & 85.6 & 89.3 & 89.2 & 0 & 95.5 & 95.3 & 95.3 & 100 & 93.7 & 92.9 & 96 & 0 & 91.7 \\
\hline Heavy Vehicles & 18 & 70 & 88 & 0 & 110 & 70 & 13 & 0 & 5 & 107 & 13 & 0 & 10 & 36 & 14 & 0 & 554 \\
\hline \% Heavy Vehicles & 6.4 & 7.5 & 43.1 & 0 & 14.4 & 10.7 & 10.8 & 0 & 4.5 & 4.7 & 4.7 & 0 & 6.3 & 7.1 & 4 & 0 & 8.3 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline Peak Hour fo & Entir & Inter & ection & Begin & & \[
0 \text { AM }
\] & & & & & & & & & & & & & & & \\
\hline 07:30 AM & 39 & 124 & 23 & 3 & 189 & 120 & 101 & 13 & 0 & 234 & 13 & 328 & 33 & 2 & 376 & 17 & 59 & 44 & 0 & 120 & 919 \\
\hline 07:45 AM & 27 & 125 & 33 & 2 & 187 & 108 & 72 & 16 & 0 & 196 & 8 & 272 & 39 & 0 & 319 & 25 & 67 & 55 & 0 & 147 & 849 \\
\hline 08:00 AM & 37 & 135 & 28 & 2 & 202 & 92 & 98 & 11 & 0 & 201 & 13 & 255 & 26 & 0 & 294 & 24 & 59 & 59 & 0 & 142 & 839 \\
\hline 08:15 AM & 40 & 119 & 19 & 0 & 178 & 105 & 80 & 11 & 0 & 196 & 11 & 360 & 39 & 0 & 410 & 20 & 55 & 38 & 0 & 113 & 897 \\
\hline Total Volume & 143 & 503 & 103 & 7 & 756 & 425 & 351 & 51 & 0 & 827 & 45 & 1215 & 137 & 2 & 1399 & 86 & 240 & 196 & 0 & 522 & 3504 \\
\hline \% App. Total & 18.9 & 66.5 & 13.6 & 0.9 & & 51.4 & 42.4 & 6.2 & 0 & & 3.2 & 86.8 & 9.8 & 0.1 & & 16.5 & 46 & 37.5 & 0 & & \\
\hline PHF & . 894 & . 931 & . 780 & . 583 & . 936 & . 885 & . 869 & . 797 & . 000 & . 884 & . 865 & . 844 & . 878 & . 250 & . 853 & . 860 & . 896 & . 831 & . 000 & . 888 & . 953 \\
\hline Cars & 135 & 466 & 60 & 7 & 668 & 370 & 311 & 43 & 0 & 724 & 42 & 1161 & 129 & 2 & 1334 & 82 & 225 & 188 & 0 & 495 & 3221 \\
\hline \% Cars & 94.4 & 92.6 & 58.3 & 100 & 88.4 & 87.1 & 88.6 & 84.3 & 0 & 87.5 & 93.3 & 95.6 & 94.2 & 100 & 95.4 & 95.3 & 93.8 & 95.9 & 0 & 94.8 & 91.9 \\
\hline Heavy Vehicles & 8 & 37 & 43 & 0 & 88 & 55 & 40 & 8 & 0 & 103 & 3 & 54 & 8 & 0 & 65 & 4 & 15 & 8 & 0 & 27 & 283 \\
\hline \% Heavy Vehicles & 5.6 & 7.4 & 41.7 & 0 & 11.6 & 12.9 & 11.4 & 15.7 & 0 & 12.5 & 6.7 & 4.4 & 5.8 & 0 & 4.6 & 4.7 & 6.3 & 4.1 & 0 & 5.2 & 8.1 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 23 & 86 & 7 & 1 & 52 & 57 & 20 & 0 & 21 & 273 & 37 & 1 & 18 & 79 & 43 & 0 & 718 \\
\hline 07:15 AM & 34 & 103 & 19 & 1 & 85 & 82 & 13 & 0 & 17 & 243 & 37 & 1 & 8 & 59 & 42 & 0 & 744 \\
\hline 07:30 AM & 38 & 110 & 14 & 3 & 107 & 88 & 10 & 0 & 12 & 307 & 31 & 2 & 16 & 56 & 42 & 0 & 836 \\
\hline 07:45 AM & 26 & 116 & 19 & 2 & 94 & 62 & 14 & 0 & 8 & 263 & 36 & 0 & 25 & 63 & 54 & 0 & 782 \\
\hline Total & 121 & 415 & 59 & 7 & 338 & 289 & 57 & 0 & 58 & 1086 & 141 & 4 & 67 & 257 & 181 & 0 & 3080 \\
\hline 08:00 AM & 35 & 130 & 17 & 2 & 79 & 88 & 9 & 0 & 12 & 245 & 26 & 0 & 23 & 53 & 55 & 0 & 774 \\
\hline 08:15 AM & 36 & 110 & 10 & 0 & 90 & 73 & 10 & 0 & 10 & 346 & 36 & 0 & 18 & 53 & 37 & 0 & 829 \\
\hline 08:30 AM & 35 & 94 & 12 & 4 & 76 & 59 & 12 & 0 & 10 & 246 & 32 & 0 & 17 & 53 & 33 & 0 & 683 \\
\hline 08:45 AM & 37 & 109 & 18 & 0 & 72 & 77 & 19 & 0 & 15 & 270 & 31 & 0 & 24 & 57 & 29 & 0 & 758 \\
\hline Total & 143 & 443 & 57 & 6 & 317 & 297 & 50 & 0 & 47 & 1107 & 125 & 0 & 82 & 216 & 154 & 0 & 3044 \\
\hline Grand Total & 264 & 858 & 116 & 13 & 655 & 586 & 107 & 0 & 105 & 2193 & 266 & 4 & 149 & 473 & 335 & 0 & 6124 \\
\hline Apprch \% & 21.1 & 68.6 & 9.3 & 1 & 48.6 & 43.5 & 7.9 & 0 & 4.1 & 85.4 & 10.4 & 0.2 & 15.6 & 49.4 & 35 & 0 & \\
\hline Total \% & 4.3 & 14 & 1.9 & 0.2 & 10.7 & 9.6 & 1.7 & 0 & 1.7 & 35.8 & 4.3 & 0.1 & 2.4 & 7.7 & 5.5 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:30 AM & 38 & 110 & 14 & 3 & 165 & 107 & 88 & 10 & 0 & 205 & 12 & 307 & 31 & 2 & 352 & 16 & 56 & 42 & 0 & 114 & 836 \\
\hline 07:45 AM & 26 & 116 & 19 & 2 & 163 & 94 & 62 & 14 & 0 & 170 & 8 & 263 & 36 & 0 & 307 & 25 & 63 & 54 & 0 & 142 & 782 \\
\hline 08:00 AM & 35 & 130 & 17 & 2 & 184 & 79 & 88 & 9 & 0 & 176 & 12 & 245 & 26 & 0 & 283 & 23 & 53 & 55 & 0 & 131 & 774 \\
\hline 08:15 AM & 36 & 110 & 10 & 0 & 156 & 90 & 73 & 10 & 0 & 173 & 10 & 346 & 36 & 0 & 392 & 18 & 53 & 37 & 0 & 108 & 829 \\
\hline Total Volume & 135 & 466 & 60 & 7 & 668 & 370 & 311 & 43 & 0 & 724 & 42 & 1161 & 129 & 2 & 1334 & 82 & 225 & 188 & 0 & 495 & 3221 \\
\hline \% App. Total & 20.2 & 69.8 & 9 & 1 & & 51.1 & 43 & 5.9 & 0 & & 3.1 & 87 & 9.7 & 0.1 & & 16.6 & 45.5 & 38 & 0 & & \\
\hline PHF & . 888 & . 896 & . 789 & . 583 & . 908 & . 864 & . 884 & . 768 & . 000 & . 883 & . 875 & . 839 & . 896 & . 250 & . 851 & . 820 & . 893 & . 855 & . 000 & . 871 & . 963 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 123066 A
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 2 & 7 & 11 & 0 & 15 & 7 & 0 & 0 & 0 & 18 & 2 & 0 & 1 & 6 & 1 & 0 & 70 \\
\hline 07:15 AM & 6 & 11 & 10 & 0 & 14 & 7 & 2 & 0 & 2 & 12 & 0 & 0 & 2 & 6 & 1 & 0 & 73 \\
\hline 07:30 AM & 1 & 14 & 9 & 0 & 13 & 13 & 3 & 0 & 1 & 21 & 2 & 0 & 1 & 3 & 2 & 0 & 83 \\
\hline 07:45 AM & 1 & 9 & 14 & 0 & 14 & 10 & 2 & 0 & 0 & 9 & 3 & 0 & 0 & 4 & 1 & 0 & 67 \\
\hline Total & 10 & 41 & 44 & 0 & 56 & 37 & 7 & 0 & 3 & 60 & 7 & 0 & 4 & 19 & 5 & 0 & 293 \\
\hline 08:00 AM & 2 & 5 & 11 & 0 & 13 & 10 & 2 & 0 & 1 & 10 & 0 & 0 & 1 & 6 & 4 & 0 & 65 \\
\hline 08:15 AM & 4 & 9 & 9 & 0 & 15 & 7 & 1 & 0 & 1 & 14 & 3 & 0 & 2 & 2 & 1 & 0 & 68 \\
\hline 08:30 AM & 2 & 9 & 11 & 0 & 12 & 10 & 2 & 0 & 0 & 9 & 1 & 0 & 2 & 6 & 4 & 0 & 68 \\
\hline 08:45 AM & 0 & 6 & 13 & 0 & 14 & 6 & 1 & 0 & 0 & 14 & 2 & 0 & 1 & 3 & 0 & 0 & 60 \\
\hline Total & 8 & 29 & 44 & 0 & 54 & 33 & 6 & 0 & 2 & 47 & 6 & 0 & 6 & 17 & 9 & 0 & 261 \\
\hline Grand Total & 18 & 70 & 88 & 0 & 110 & 70 & 13 & 0 & 5 & 107 & 13 & 0 & 10 & 36 & 14 & 0 & 554 \\
\hline Apprch \% & 10.2 & 39.8 & 50 & 0 & 57 & 36.3 & 6.7 & 0 & 4 & 85.6 & 10.4 & 0 & 16.7 & 60 & 23.3 & 0 & \\
\hline Total \% & 3.2 & 12.6 & 15.9 & 0 & 19.9 & 12.6 & 2.3 & 0 & 0.9 & 19.3 & 2.3 & 0 & 1.8 & 6.5 & 2.5 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:00 AM & 2 & 7 & 11 & 0 & 20 & 15 & 7 & 0 & 0 & 22 & 0 & 18 & 2 & 0 & 20 & 1 & 6 & 1 & 0 & 8 & 70 \\
\hline 07:15 AM & 6 & 11 & 10 & 0 & 27 & 14 & 7 & 2 & 0 & 23 & 2 & 12 & 0 & 0 & 14 & 2 & 6 & 1 & 0 & 9 & 73 \\
\hline 07:30 AM & 1 & 14 & 9 & 0 & 24 & 13 & 13 & 3 & 0 & 29 & 1 & 21 & 2 & 0 & 24 & 1 & 3 & 2 & 0 & 6 & 83 \\
\hline 07:45 AM & 1 & 9 & 14 & 0 & 24 & 14 & 10 & 2 & 0 & 26 & 0 & 9 & 3 & 0 & 12 & 0 & 4 & 1 & 0 & 5 & 67 \\
\hline Total Volume & 10 & 41 & 44 & 0 & 95 & 56 & 37 & 7 & 0 & 100 & 3 & 60 & 7 & 0 & 70 & 4 & 19 & 5 & 0 & 28 & 293 \\
\hline \% App. Total & 10.5 & 43.2 & 46.3 & 0 & & 56 & 37 & 7 & 0 & & 4.3 & 85.7 & 10 & 0 & & 14.3 & 67.9 & 17.9 & 0 & & \\
\hline PHF & . 417 & . 732 & . 786 & . 000 & . 880 & . 933 & . 712 & . 583 & . 000 & . 862 & . 375 & . 714 & . 583 & . 000 & . 729 & . 500 & . 792 & . 625 & . 000 & . 778 & . 883 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES,LLC

File Name : 123066 A
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Int. Total \\
\hline 07:00 AM & 0 & 0 & 0 & 28 & 0 & 1 & 0 & 5 & 0 & 0 & 0 & 98 & 0 & 0 & 0 & 28 & 160 \\
\hline 07:15 AM & 0 & 0 & 1 & 32 & 0 & 1 & 0 & 4 & 0 & 1 & 2 & 66 & 0 & 0 & 0 & 24 & 131 \\
\hline 07:30 AM & 0 & 0 & 0 & 46 & 0 & 1 & 0 & 10 & 0 & 0 & 1 & 98 & 0 & 0 & 0 & 47 & 203 \\
\hline 07:45 AM & 0 & 0 & 0 & 27 & 0 & 1 & 0 & 5 & 0 & 2 & 0 & 56 & 0 & 0 & 0 & 39 & 130 \\
\hline Total & 0 & 0 & 1 & 133 & 0 & 4 & 0 & 24 & 0 & 3 & 3 & 318 & 0 & 0 & 0 & 138 & 624 \\
\hline 08:00 AM & 0 & 0 & 0 & 9 & 1 & 1 & 0 & 3 & 0 & 0 & 0 & 31 & 0 & 0 & 0 & 33 & 78 \\
\hline 08:15 AM & 0 & 0 & 0 & 24 & 0 & 0 & 0 & 9 & 0 & 0 & 0 & 33 & 0 & 3 & 0 & 62 & 131 \\
\hline 08:30 AM & 0 & 1 & 0 & 20 & 0 & 0 & 0 & 6 & 0 & 3 & 0 & 44 & 0 & 2 & 0 & 61 & 137 \\
\hline 08:45 AM & 0 & 0 & 0 & 22 & 0 & 2 & 0 & 2 & 0 & 1 & 0 & 36 & 0 & 1 & 1 & 60 & 125 \\
\hline Total & 0 & 1 & 0 & 75 & 1 & 3 & 0 & 20 & 0 & 4 & 0 & 144 & 0 & 6 & 1 & 216 & 471 \\
\hline Grand Total & 0 & 1 & 1 & 208 & 1 & 7 & 0 & 44 & 0 & 7 & 3 & 462 & 0 & 6 & 1 & 354 & 1095 \\
\hline Apprch \% & 0 & 0.5 & 0.5 & 99 & 1.9 & 13.5 & 0 & 84.6 & 0 & 1.5 & 0.6 & 97.9 & 0 & 1.7 & 0.3 & 98.1 & \\
\hline Total \% & 0 & 0.1 & 0.1 & 19 & 0.1 & 0.6 & 0 & 4 & 0 & 0.6 & 0.3 & 42.2 & 0 & 0.5 & 0.1 & 32.3 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{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} \\
\hline 07:00 AM & 0 & 0 & 0 & 28 & 28 & 0 & 1 & 0 & 5 & 6 & 0 & 0 & 0 & 98 & 98 & 0 & 0 & 0 & 28 & 28 & 160 \\
\hline 07:15 AM & 0 & 0 & 1 & 32 & 33 & 0 & 1 & 0 & 4 & 5 & 0 & 1 & 2 & 66 & 69 & 0 & 0 & 0 & 24 & 24 & 131 \\
\hline 07:30 AM & 0 & 0 & 0 & 46 & 46 & 0 & 1 & 0 & 10 & 11 & 0 & 0 & 1 & 98 & 99 & 0 & 0 & 0 & 47 & 47 & 203 \\
\hline 07:45 AM & 0 & 0 & 0 & 27 & 27 & 0 & 1 & 0 & 5 & 6 & 0 & 2 & 0 & 56 & 58 & 0 & 0 & 0 & 39 & 39 & 130 \\
\hline Total Volume & 0 & 0 & 1 & 133 & 134 & 0 & 4 & 0 & 24 & 28 & 0 & 3 & 3 & 318 & 324 & 0 & 0 & 0 & 138 & 138 & 624 \\
\hline \% App. Total & 0 & 0 & 0.7 & 99.3 & & 0 & 14.3 & 0 & 85.7 & & 0 & 0.9 & 0.9 & 98.1 & & 0 & 0 & 0 & 100 & & \\
\hline PHF & . 000 & . 000 & . 250 & . 723 & . 728 & . 000 & 1.00 & . 000 & . 600 & . 636 & . 000 & . 375 & . 375 & . 811 & . 818 & . 000 & . 000 & . 000 & . 734 & . 734 & . 768 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 123066 A
Site Code : 2010036
Start Date : 10/4/2012
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{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} \\
\hline Peak Hour for & Entir & Inter & section & Begin & \[
\text { s at } 07: 3
\] & \[
0 \text { AM }
\] & & & & & & & & & & & & & & & \\
\hline 07:30 AM & 39 & 124 & 23 & 3 & 189 & 120 & 101 & 13 & 0 & 234 & 13 & 328 & 33 & 2 & 376 & 17 & 59 & 44 & 0 & 120 & 919 \\
\hline 07:45 AM & 27 & 125 & 33 & 2 & 187 & 108 & 72 & 16 & 0 & 196 & 8 & 272 & 39 & 0 & 319 & 25 & 67 & 55 & 0 & 147 & 849 \\
\hline 08:00 AM & 37 & 135 & 28 & 2 & 202 & 92 & 98 & 11 & 0 & 201 & 13 & 255 & 26 & 0 & 294 & 24 & 59 & 59 & 0 & 142 & 839 \\
\hline 08:15 AM & 40 & 119 & 19 & 0 & 178 & 105 & 80 & 11 & 0 & 196 & 11 & 360 & 39 & 0 & 410 & 20 & 55 & 38 & 0 & 113 & 897 \\
\hline Total Volume & 143 & 503 & 103 & 7 & 756 & 425 & 351 & 51 & 0 & 827 & 45 & 1215 & 137 & 2 & 1399 & 86 & 240 & 196 & 0 & 522 & 3504 \\
\hline \% App. Total & 18.9 & 66.5 & 13.6 & 0.9 & & 51.4 & 42.4 & 6.2 & 0 & & 3.2 & 86.8 & 9.8 & 0.1 & & 16.5 & 46 & 37.5 & 0 & & \\
\hline PHF & . 894 & . 931 & . 780 & . 583 & . 936 & . 885 & . 869 & . 797 & . 000 & . 884 & . 865 & . 844 & . 878 & . 250 & . 853 & . 860 & . 896 & . 831 & . 000 & . 888 & . 953 \\
\hline Cars & 135 & 466 & 60 & 7 & 668 & 370 & 311 & 43 & 0 & 724 & 42 & 1161 & 129 & 2 & 1334 & 82 & 225 & 188 & 0 & 495 & 3221 \\
\hline \% Cars & 94.4 & 92.6 & 58.3 & 100 & 88.4 & 87.1 & 88.6 & 84.3 & 0 & 87.5 & 93.3 & 95.6 & 94.2 & 100 & 95.4 & 95.3 & 93.8 & 95.9 & 0 & 94.8 & 91.9 \\
\hline Heavy Vehicles & 8 & 37 & 43 & 0 & 88 & 55 & 40 & 8 & 0 & 103 & 3 & 54 & 8 & 0 & 65 & 4 & 15 & 8 & 0 & 27 & 283 \\
\hline \% Heavy Vehicles & 5.6 & 7.4 & 41.7 & 0 & 11.6 & 12.9 & 11.4 & 15.7 & 0 & 12.5 & 6.7 & 4.4 & 5.8 & 0 & 4.6 & 4.7 & 6.3 & 4.1 & 0 & 5.2 & 8.1 \\
\hline
\end{tabular}


N/S: Tremont Street/ Columbus Avenue
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City, State: Boston, MA
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PRECISION
D A T A INDUSTRIES,LLC


File Name : 123066 AA
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline Peak Hour Analysis & From 04 & PM to & :45 PM & Peak 1 & f 1 & & & & & & & & & & & & & & & & \\
\hline \multicolumn{22}{|l|}{Peak Hour for Entire Intersection Begins at 04:15 PM} \\
\hline 04:15 PM & 40 & 250 & 38 & 2 & 330 & 94 & 64 & 12 & 0 & 170 & 21 & 201 & 32 & 0 & 254 & 23 & 72 & 37 & 0 & 132 & 886 \\
\hline 04:30 PM & 29 & 227 & 35 & 0 & 291 & 89 & 73 & 15 & 0 & 177 & 18 & 195 & 53 & 0 & 266 & 28 & 84 & 42 & 0 & 154 & 888 \\
\hline 04:45 PM & 27 & 232 & 39 & 0 & 298 & 77 & 68 & 15 & 0 & 160 & 23 & 219 & 30 & 0 & 272 & 19 & 67 & 39 & 0 & 125 & 855 \\
\hline 05:00 PM & 22 & 217 & 39 & 2 & 280 & 75 & 73 & 18 & 0 & 166 & 22 & 174 & 27 & 0 & 223 & 36 & 82 & 36 & 0 & 154 & 823 \\
\hline Total Volume & 118 & 926 & 151 & 4 & 1199 & 335 & 278 & 60 & 0 & 673 & 84 & 789 & 142 & 0 & 1015 & 106 & 305 & 154 & 0 & 565 & 3452 \\
\hline \% App. Total & 9.8 & 77.2 & 12.6 & 0.3 & & 49.8 & 41.3 & 8.9 & 0 & & 8.3 & 77.7 & 14 & 0 & & 18.8 & 54 & 27.3 & 0 & & \\
\hline PHF & . 738 & . 926 & . 968 & . 500 & . 908 & . 891 & . 952 & . 833 & . 000 & . 951 & . 913 & . 901 & . 670 & . 000 & . 933 & . 736 & . 908 & . 917 & . 000 & . 917 & . 972 \\
\hline Cars & 114 & 900 & 120 & 4 & 1138 & 299 & 267 & 57 & 0 & 623 & 82 & 756 & 140 & 0 & 978 & 104 & 291 & 148 & 0 & 543 & 3282 \\
\hline \% Cars & 96.6 & 97.2 & 79.5 & 100 & 94.9 & 89.3 & 96.0 & 95.0 & 0 & 92.6 & 97.6 & 95.8 & 98.6 & 0 & 96.4 & 98.1 & 95.4 & 96.1 & 0 & 96.1 & 95.1 \\
\hline Heavy Vehicles & 4 & 26 & 31 & 0 & 61 & 36 & 11 & 3 & 0 & 50 & 2 & 33 & 2 & 0 & 37 & 2 & 14 & 6 & 0 & 22 & 170 \\
\hline \% Heavy Vehicles & 3.4 & 2.8 & 20.5 & 0 & 5.1 & 10.7 & 4.0 & 5.0 & 0 & 7.4 & 2.4 & 4.2 & 1.4 & 0 & 3.6 & 1.9 & 4.6 & 3.9 & 0 & 3.9 & 4.9 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street
City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 22 & 216 & 27 & 1 & 49 & 55 & 18 & 0 & 21 & 178 & 28 & 0 & 25 & 70 & 31 & 0 & 741 \\
\hline 04:15 PM & 36 & 244 & 31 & 2 & 82 & 60 & 12 & 0 & 21 & 195 & 31 & 0 & 22 & 69 & 35 & 0 & 840 \\
\hline 04:30 PM & 29 & 222 & 25 & 0 & 79 & 70 & 15 & 0 & 18 & 187 & 53 & 0 & 27 & 81 & 40 & 0 & 846 \\
\hline 04:45 PM & 27 & 224 & 32 & 0 & 72 & 66 & 13 & 0 & 23 & 210 & 29 & 0 & 19 & 64 & 37 & 0 & 816 \\
\hline Total & 114 & 906 & 115 & 3 & 282 & 251 & 58 & 0 & 83 & 770 & 141 & 0 & 93 & 284 & 143 & 0 & 3243 \\
\hline 05:00 PM & 22 & 210 & 32 & 2 & 66 & 71 & 17 & 0 & 20 & 164 & 27 & 0 & 36 & 77 & 36 & 0 & 780 \\
\hline 05:15 PM & 33 & 233 & 27 & 0 & 47 & 54 & 15 & 0 & 20 & 228 & 26 & 0 & 26 & 73 & 24 & 0 & 806 \\
\hline 05:30 PM & 34 & 206 & 28 & 1 & 72 & 71 & 12 & 0 & 28 & 173 & 30 & 0 & 42 & 70 & 36 & 0 & 803 \\
\hline 05:45 PM & 28 & 222 & 19 & 0 & 56 & 57 & 14 & 0 & 24 & 217 & 32 & 1 & 32 & 69 & 22 & 0 & 793 \\
\hline Total & 117 & 871 & 106 & 3 & 241 & 253 & 58 & 0 & 92 & 782 & 115 & 1 & 136 & 289 & 118 & 0 & 3182 \\
\hline Grand Total & 231 & 1777 & 221 & 6 & 523 & 504 & 116 & 0 & 175 & 1552 & 256 & 1 & 229 & 573 & 261 & 0 & 6425 \\
\hline Apprch \% & 10.3 & 79.5 & 9.9 & 0.3 & 45.8 & 44.1 & 10.1 & 0 & 8.8 & 78.2 & 12.9 & 0.1 & 21.5 & 53.9 & 24.6 & 0 & \\
\hline Total \% & 3.6 & 27.7 & 3.4 & 0.1 & 8.1 & 7.8 & 1.8 & 0 & 2.7 & 24.2 & 4 & 0 & 3.6 & 8.9 & 4.1 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:15 PM & 36 & 244 & 31 & 2 & 313 & 82 & 60 & 12 & 0 & 154 & 21 & 195 & 31 & 0 & 247 & 22 & 69 & 35 & 0 & 126 & 840 \\
\hline 04:30 PM & 29 & 222 & 25 & 0 & 276 & 79 & 70 & 15 & 0 & 164 & 18 & 187 & 53 & 0 & 258 & 27 & 81 & 40 & 0 & 148 & 846 \\
\hline 04:45 PM & 27 & 224 & 32 & 0 & 283 & 72 & 66 & 13 & 0 & 151 & 23 & 210 & 29 & 0 & 262 & 19 & 64 & 37 & 0 & 120 & 816 \\
\hline 05:00 PM & 22 & 210 & 32 & 2 & 266 & 66 & 71 & 17 & 0 & 154 & 20 & 164 & 27 & 0 & 211 & 36 & 77 & 36 & 0 & 149 & 780 \\
\hline Total Volume & 114 & 900 & 120 & 4 & 1138 & 299 & 267 & 57 & 0 & 623 & 82 & 756 & 140 & 0 & 978 & 104 & 291 & 148 & 0 & 543 & 3282 \\
\hline \% App. Total & 10 & 79.1 & 10.5 & 0.4 & & 48 & 42.9 & 9.1 & 0 & & 8.4 & 77.3 & 14.3 & 0 & & 19.2 & 53.6 & 27.3 & 0 & & \\
\hline PHF & . 792 & . 922 & . 938 & . 500 & . 909 & . 912 & . 940 & . 838 & . 000 & . 950 & . 891 & . 900 & . 660 & . 000 & . 933 & . 722 & . 898 & . 925 & . 000 & . 911 & . 970 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 123066 AA
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 0 & 12 & 12 & 0 & 10 & 6 & 1 & 0 & 0 & 9 & 2 & 0 & 0 & 7 & 1 & 0 & 60 \\
\hline 04:15 PM & 4 & 6 & 7 & 0 & 12 & 4 & 0 & 0 & 0 & 6 & 1 & 0 & 1 & 3 & 2 & 0 & 46 \\
\hline 04:30 PM & 0 & 5 & 10 & 0 & 10 & 3 & 0 & 0 & 0 & 8 & 0 & 0 & 1 & 3 & 2 & 0 & 42 \\
\hline 04:45 PM & 0 & 8 & 7 & 0 & 5 & 2 & 2 & 0 & 0 & 9 & 1 & 0 & 0 & 3 & 2 & 0 & 39 \\
\hline Total & 4 & 31 & 36 & 0 & 37 & 15 & 3 & 0 & 0 & 32 & 4 & 0 & 2 & 16 & 7 & 0 & 187 \\
\hline 05:00 PM & 0 & 7 & 7 & 0 & 9 & 2 & 1 & 0 & 2 & 10 & 0 & 0 & 0 & 5 & 0 & 0 & 43 \\
\hline 05:15 PM & 0 & 4 & 8 & 0 & 7 & 2 & 1 & 0 & 0 & 9 & 2 & 0 & 1 & 3 & 1 & 0 & 38 \\
\hline 05:30 PM & 0 & 8 & 9 & 0 & 14 & 2 & 0 & 0 & 0 & 6 & 0 & 0 & 0 & 3 & 0 & 0 & 42 \\
\hline 05:45 PM & 0 & 6 & 9 & 0 & 11 & 2 & 0 & 0 & 1 & 7 & 1 & 0 & 3 & 3 & 0 & 0 & 43 \\
\hline Total & 0 & 25 & 33 & 0 & 41 & 8 & 2 & 0 & 3 & 32 & 3 & 0 & 4 & 14 & 1 & 0 & 166 \\
\hline Grand Total & 4 & 56 & 69 & 0 & 78 & 23 & 5 & 0 & 3 & 64 & 7 & 0 & 6 & 30 & 8 & 0 & 353 \\
\hline Apprch \% & 3.1 & 43.4 & 53.5 & 0 & 73.6 & 21.7 & 4.7 & 0 & 4.1 & 86.5 & 9.5 & 0 & 13.6 & 68.2 & 18.2 & 0 & \\
\hline Total \% & 1.1 & 15.9 & 19.5 & 0 & 22.1 & 6.5 & 1.4 & 0 & 0.8 & 18.1 & 2 & 0 & 1.7 & 8.5 & 2.3 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:00 PM & 0 & 12 & 12 & 0 & 24 & 10 & 6 & 1 & 0 & 17 & 0 & 9 & 2 & 0 & 11 & 0 & 7 & 1 & 0 & 8 & 60 \\
\hline 04:15 PM & 4 & 6 & 7 & 0 & 17 & 12 & 4 & 0 & 0 & 16 & 0 & 6 & 1 & 0 & 7 & 1 & 3 & 2 & 0 & 6 & 46 \\
\hline 04:30 PM & 0 & 5 & 10 & 0 & 15 & 10 & 3 & 0 & 0 & 13 & 0 & 8 & 0 & 0 & 8 & 1 & 3 & 2 & 0 & 6 & 42 \\
\hline 04:45 PM & 0 & 8 & 7 & 0 & 15 & 5 & 2 & 2 & 0 & 9 & 0 & 9 & 1 & 0 & 10 & 0 & 3 & 2 & 0 & 5 & 39 \\
\hline Total Volume & 4 & 31 & 36 & 0 & 71 & 37 & 15 & 3 & 0 & 55 & 0 & 32 & 4 & 0 & 36 & 2 & 16 & 7 & 0 & 25 & 187 \\
\hline \% App. Total & 5.6 & 43.7 & 50.7 & 0 & & 67.3 & 27.3 & 5.5 & 0 & & 0 & 88.9 & 11.1 & 0 & & 8 & 64 & 28 & 0 & & \\
\hline PHF & . 250 & . 646 & . 750 & . 000 & . 740 & . 771 & . 625 & . 375 & . 000 & . 809 & . 000 & . 889 & . 500 & . 000 & . 818 & . 500 & . 571 & . 875 & . 000 & . 781 & . 779 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax:508.545.1234
Email: datarequests@pdillc.com

File Name : 123066 AA
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Malcom X Boulevard From East} & \multicolumn{4}{|c|}{Columbus Avenue From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Int. Total \\
\hline 04:00 PM & 0 & 0 & 0 & 31 & 0 & 0 & 0 & 16 & 0 & 0 & 0 & 65 & 0 & 0 & 0 & 23 & 135 \\
\hline 04:15 PM & 0 & 0 & 0 & 22 & 0 & 0 & 0 & 10 & 0 & 1 & 0 & 50 & 0 & 0 & 0 & 29 & 112 \\
\hline 04:30 PM & 0 & 0 & 0 & 13 & 1 & 1 & 0 & 12 & 0 & 0 & 0 & 38 & 0 & 1 & 0 & 32 & 98 \\
\hline 04:45 PM & 0 & 0 & 0 & 31 & 0 & 0 & 0 & 11 & 0 & 1 & 1 & 51 & 0 & 1 & 0 & 39 & 135 \\
\hline Total & 0 & 0 & 0 & 97 & 1 & 1 & 0 & 49 & 0 & 2 & 1 & 204 & 0 & 2 & 0 & 123 & 480 \\
\hline 05:00 PM & 0 & 1 & 1 & 40 & 0 & 1 & 1 & 11 & 0 & 0 & 0 & 56 & 0 & 3 & 0 & 56 & 170 \\
\hline 05:15 PM & 0 & 1 & 1 & 20 & 0 & 0 & 0 & 12 & 0 & 1 & 0 & 54 & 0 & 1 & 0 & 54 & 144 \\
\hline 05:30 PM & 0 & 0 & 0 & 34 & 0 & 1 & 0 & 13 & 0 & 0 & 0 & 58 & 1 & 0 & 0 & 40 & 147 \\
\hline 05:45 PM & 0 & 0 & 0 & 29 & 0 & 0 & 0 & 10 & 0 & 0 & 0 & 33 & 0 & 0 & 0 & 53 & 125 \\
\hline Total & 0 & 2 & 2 & 123 & 0 & 2 & 1 & 46 & 0 & 1 & 0 & 201 & 1 & 4 & 0 & 203 & 586 \\
\hline Grand Total & 0 & 2 & 2 & 220 & 1 & 3 & 1 & 95 & 0 & 3 & 1 & 405 & 1 & 6 & 0 & 326 & 1066 \\
\hline Apprch \% & 0 & 0.9 & 0.9 & 98.2 & 1 & 3 & 1 & 95 & 0 & 0.7 & 0.2 & 99 & 0.3 & 1.8 & 0 & 97.9 & \\
\hline Total \% & 0 & 0.2 & 0.2 & 20.6 & 0.1 & 0.3 & 0.1 & 8.9 & 0 & 0.3 & 0.1 & 38 & 0.1 & 0.6 & 0 & 30.6 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:45 PM & 0 & 0 & 0 & 31 & 31 & 0 & 0 & 0 & 11 & 11 & 0 & 1 & 1 & 51 & 53 & 0 & 1 & 0 & 39 & 40 & 135 \\
\hline 05:00 PM & 0 & 1 & 1 & 40 & 42 & 0 & 1 & 1 & 11 & 13 & 0 & 0 & 0 & 56 & 56 & 0 & 3 & 0 & 56 & 59 & 170 \\
\hline 05:15 PM & 0 & 1 & 1 & 20 & 22 & 0 & 0 & 0 & 12 & 12 & 0 & 1 & 0 & 54 & 55 & 0 & 1 & 0 & 54 & 55 & 144 \\
\hline 05:30 PM & 0 & 0 & 0 & 34 & 34 & 0 & 1 & 0 & 13 & 14 & 0 & 0 & 0 & 58 & 58 & 1 & 0 & 0 & 40 & 41 & 147 \\
\hline Total Volume & 0 & 2 & 2 & 125 & 129 & 0 & 2 & 1 & 47 & 50 & 0 & 2 & 1 & 219 & 222 & 1 & 5 & 0 & 189 & 195 & 596 \\
\hline \% App. Total & 0 & 1.6 & 1.6 & 96.9 & & 0 & 4 & 2 & 94 & & 0 & 0.9 & 0.5 & 98.6 & & 0.5 & 2.6 & 0 & 96.9 & & \\
\hline PHF & . 000 & . 500 & . 500 & . 781 & . 768 & . 000 & . 500 & . 250 & . 904 & . 893 & . 000 & . 500 & . 250 & . 944 & . 957 & . 250 & . 417 & . 000 & . 844 & . 826 & . 876 \\
\hline
\end{tabular}

N/S: Tremont Street/ Columbus Avenue
E/W: Malcom X Boulevard/ Tremont Street City, State: Boston, MA
Client: Howard Stein-Hudson/ M. Tremblay

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 123066 AA
Site Code : 2010036.
Start Date : 10/4/2012
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Tremont Street From North} & \multicolumn{5}{|c|}{Malcom X Boulevard From East} & \multicolumn{5}{|c|}{Columbus Avenue From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at \(04 \cdot 15 \mathrm{PM}\)} \\
\hline Peak Hour for & Entir & Inters & section & Begin & at 04: & 5 PM & & & & & & & & & & & & & & & \\
\hline 04:15 PM & 40 & 250 & 38 & 2 & 330 & 94 & 64 & 12 & 0 & 170 & 21 & 201 & 32 & 0 & 254 & 23 & 72 & 37 & 0 & 132 & 886 \\
\hline 04:30 PM & 29 & 227 & 35 & 0 & 291 & 89 & 73 & 15 & 0 & 177 & 18 & 195 & 53 & 0 & 266 & 28 & 84 & 42 & 0 & 154 & 888 \\
\hline 04:45 PM & 27 & 232 & 39 & 0 & 298 & 77 & 68 & 15 & 0 & 160 & 23 & 219 & 30 & 0 & 272 & 19 & 67 & 39 & 0 & 125 & 855 \\
\hline 05:00 PM & 22 & 217 & 39 & 2 & 280 & 75 & 73 & 18 & 0 & 166 & 22 & 174 & 27 & 0 & 223 & 36 & 82 & 36 & 0 & 154 & 823 \\
\hline Total Volume & 118 & 926 & 151 & 4 & 1199 & 335 & 278 & 60 & 0 & 673 & 84 & 789 & 142 & 0 & 1015 & 106 & 305 & 154 & 0 & 565 & 3452 \\
\hline \% App. Total & 9.8 & 77.2 & 12.6 & 0.3 & & 49.8 & 41.3 & 8.9 & 0 & & 8.3 & 77.7 & 14 & 0 & & 18.8 & 54 & 27.3 & 0 & & \\
\hline PHF & . 738 & . 926 & . 968 & . 500 & . 908 & . 891 & . 952 & . 833 & . 000 & . 951 & . 913 & . 901 & . 670 & . 000 & . 933 & . 736 & . 908 & . 917 & . 000 & . 917 & . 972 \\
\hline Cars & 114 & 900 & 120 & 4 & 1138 & 299 & 267 & 57 & 0 & 623 & 82 & 756 & 140 & 0 & 978 & 104 & 291 & 148 & 0 & 543 & 3282 \\
\hline \% Cars & 96.6 & 97.2 & 79.5 & 100 & 94.9 & 89.3 & 96.0 & 95.0 & 0 & 92.6 & 97.6 & 95.8 & 98.6 & 0 & 96.4 & 98.1 & 95.4 & 96.1 & 0 & 96.1 & 95.1 \\
\hline Heavy Vehicles & 4 & 26 & 31 & 0 & 61 & 36 & 11 & 3 & 0 & 50 & 2 & 33 & 2 & 0 & 37 & 2 & 14 & 6 & 0 & 22 & 170 \\
\hline \% Heavy Vehicles & 3.4 & 2.8 & 20.5 & 0 & 5.1 & 10.7 & 4.0 & 5.0 & 0 & 7.4 & 2.4 & 4.2 & 1.4 & 0 & 3.6 & 1.9 & 4.6 & 3.9 & 0 & 3.9 & 4.9 \\
\hline
\end{tabular}


N/S: Gurney Street/Terrace Street
E/W/NE: Trempont Street/ Mid Block Cross
City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey


PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503 Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143755 A
Site Code : 13078
Start Date : 2/27/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Gurney Street From North} & \multicolumn{5}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Terrace Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
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Left & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 108 & 3 & 0 & 10 & 0 & 49 & 38 & 0 & 6 & 129 & 0 & 3 & 0 & 351 \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 & 168 & 5 & 0 & 11 & 0 & 60 & 29 & 0 & 11 & 109 & 0 & 4 & 0 & 407 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 140 & 7 & 0 & 4 & 0 & 60 & 33 & 0 & 20 & 107 & 0 & 1 & 0 & 385 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 20 & 140 & 5 & 0 & 12 & 0 & 62 & 30 & 0 & 17 & 142 & 0 & 0 & 0 & 428 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 48 & 556 & 20 & 0 & 37 & 0 & 231 & 130 & 0 & 54 & 487 & 0 & 8 & 0 & 1571 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 159 & 13 & 0 & 14 & 0 & 46 & 29 & 0 & 13 & 121 & 0 & 1 & 0 & 413 \\
\hline 08:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 18 & 134 & 5 & 0 & 9 & 0 & 48 & 33 & 0 & 13 & 124 & 0 & 2 & 0 & 386 \\
\hline 08:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 11 & 121 & 9 & 0 & 12 & 0 & 54 & 26 & 0 & 10 & 126 & 0 & 1 & 0 & 370 \\
\hline 08:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 19 & 134 & 5 & 0 & 14 & 0 & 56 & 27 & 0 & 19 & 94 & 0 & 1 & 0 & 369 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 65 & 548 & 32 & 0 & 49 & 0 & 204 & 115 & 0 & 55 & 465 & 0 & 5 & 0 & 1538 \\
\hline Grand Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 113 & 1104 & 52 & 0 & 86 & 0 & 435 & 245 & 0 & 109 & 952 & 0 & 13 & 0 & 3109 \\
\hline Apprch \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 8.9 & 87 & 4.1 & 0 & 11.2 & 0 & 56.8 & 32 & 0 & 10.1 & 88.6 & 0 & 1.2 & 0 & \\
\hline Total \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3.6 & 35.5 & 1.7 & 0 & 2.8 & 0 & 14 & 7.9 & 0 & 3.5 & 30.6 & 0 & 0.4 & 0 & \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 109 & 1030 & 50 & 0 & 82 & 0 & 431 & 238 & 0 & 108 & 891 & 0 & 13 & 0 & 2952 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 96.5 & 93.3 & 96.2 & 0 & 95.3 & 0 & 99.1 & 97.1 & 0 & 99.1 & 93.6 & 0 & 100 & 0 & 95 \\
\hline Heavy Vehicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 74 & 2 & 0 & 4 & 0 & 4 & 7 & 0 & 1 & 61 & 0 & 0 & 0 & 157 \\
\hline \% Heary Veticles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3.5 & 6.7 & 3.8 & 0 & 4.7 & 0 & 0.9 & 2.9 & 0 & 0.9 & 6.4 & 0 & 0 & 0 & 5 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \multirow[b]{2}{*}{int Total} \\
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\hline \multicolumn{32}{|l|}{} \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 & 168 & 5 & 0 & 183 & 11 & 0 & 60 & 29 & 0 & 100 & 11 & 109 & 0 & 4 & 0 & 124 & 407 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 140 & 7 & 0 & 160 & 4 & 0 & 60 & 33 & 0 & 97 & 20 & 107 & 0 & 1 & 0 & 128 & 385 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 20 & 140 & 5 & 0 & 165 & 12 & 0 & 62 & 30 & 0 & 104 & 17 & 142 & 0 & 0 & 0 & 159 & 428 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 159 & 13 & 0 & 189 & 14 & 0 & 46 & 29 & 0 & 89 & 13 & 121 & 0 & 1 & 0 & 135 & 413 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 60 & 607 & 30 & 0 & 697 & 41 & 0 & 228 & 121 & 0 & 390 & 61 & 479 & 0 & 6 & 0 & 546 & 1633 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 8.6 & 87.1 & 4.3 & 0 & & 10.5 & 0 & 58.5 & 31 & 0 & & 11.2 & 87.7 & 0 & 1.1 & 0 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 750 & . 903 & . 577 & . 000 & . 922 & . 732 & . 000 & . 919 & . 917 & . 000 & . 938 & . 763 & . 843 & . 000 & . 375 & . 000 & . 858 & . 954 \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 56 & 563 & 29 & 0 & 648 & 39 & 0 & 227 & 119 & 0 & 385 & 61 & 450 & 0 & 6 & 0 & 517 & 1550 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 93.3 & 92.8 & 96.7 & 0 & 93.0 & 95.1 & 0 & 99.6 & 98.3 & 0 & 98.7 & 100 & 93.9 & 0 & 100 & 0 & 94.7 & 94.9 \\
\hline Heary venicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 44 & 1 & 0 & 49 & 2 & 0 & 1 & 2 & 0 & 5 & 0 & 29 & 0 & 0 & 0 & 29 & 83 \\
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\end{tabular} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 6.7 & 7.2 & 3.3 & 0 & 7.0 & 4.9 & 0 & 0.4 & 1.7 & 0 & 1.3 & 0 & 6.1 & 0 & 0 & 0 & 5.3 & 5.1 \\
\hline
\end{tabular}

N/S: Gurney Street/Terrace Street
E/W/NE: Trempont Street/ Mid Block Cross
City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax:508.545.1234 Email:datarequests@pdillc.com

File Name : 143755 A
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \multirow[b]{2}{*}{Int. Total} \\
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\hline \multicolumn{32}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:15} \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 & 155 & 5 & 0 & 170 & 11 & 0 & 60 & 28 & 0 & 99 & 11 & 104 & 0 & 4 & 0 & 119 & 388 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 12 & 127 & 6 & 0 & 145 & 4 & 0 & 60 & 32 & 0 & 96 & 20 & 101 & 0 & 1 & 0 & 122 & 363 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 20 & 132 & 5 & 0 & 157 & 12 & 0 & 62 & 30 & 0 & 104 & 17 & 133 & 0 & 0 & 0 & 150 & 411 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 14 & 149 & 13 & 0 & 176 & 12 & 0 & 45 & 29 & 0 & 86 & 13 & 112 & 0 & 1 & 0 & 126 & 388 \\
\hline Tota Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 56 & 563 & 29 & 0 & 648 & 39 & 0 & 227 & 119 & 0 & 385 & 61 & 450 & 0 & 6 & 0 & 517 & 1550 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 8.6 & 86.9 & 4.5 & 0 & & 10.1 & 0 & 59 & 30.9 & 0 & & 11.8 & 87 & 0 & 1.2 & 0 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 700 & . 908 & . 558 & . 000 & . 920 & . 813 & . 000 & . 915 & . 930 & . 000 & . 925 & . 763 & . 846 & . 000 & . 375 & . 000 & . 862 & . 943 \\
\hline
\end{tabular}

N/S: Gurney Street/Terrace Street
E/W/NE: Trempont Street/ Mid Block Cross
City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey

كِ
PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143755 A
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Gurney Street From North} & \multicolumn{5}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Terrace Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
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\end{tabular} & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 6 & 0 & 0 & 2 & 0 & 2 & 2 & 0 & 0 & 7 & 0 & 0 & 0 & 19 \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 5 & 0 & 0 & 0 & 19 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 13 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 6 & 0 & 0 & 0 & 22 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 8 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 0 & 0 & 0 & 17 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 40 & 1 & 0 & 2 & 0 & 2 & 4 & 0 & 0 & 27 & 0 & 0 & 0 & 77 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 10 & 0 & 0 & 2 & 0 & 1 & 0 & 0 & 0 & 9 & 0 & 0 & 0 & 25 \\
\hline 08:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 8 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 10 & 0 & 0 & 0 & 20 \\
\hline 08:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 9 & 0 & 0 & 0 & 21 \\
\hline 08:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 6 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 & 6 & 0 & 0 & 0 & 14 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 34 & 1 & 0 & 2 & 0 & 2 & 3 & 0 & 1 & 34 & 0 & 0 & 0 & 80 \\
\hline
\end{tabular}
\begin{tabular}{r|rrrrr|rrrrr|rrrrr|rrrrrrrrrrrrrrrr} 
Grand Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 74 & 2 & 0 & 4 & 0 & 4 & 7 & 0 & 1 & 61 & 0 & 0 & 0 & 157 \\
Apprch \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 92.5 & 2.5 & 0 & 26.7 & 0 & 26.7 & 46.7 & 0 & 1.6 & 98.4 & 0 & 0 & 0 &
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\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \multirow[b]{2}{*}{Int. Total} \\
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\hline \multicolumn{32}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1} \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 13 & 1 & 0 & 15 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 6 & 0 & 0 & 0 & 6 & 22 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 8 & 0 & 0 & 8 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 0 & 0 & 0 & 9 & 17 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 10 & 0 & 0 & 13 & 2 & 0 & 1 & 0 & 0 & 3 & 0 & 9 & 0 & 0 & 0 & 9 & 25 \\
\hline 08:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 8 & 1 & 0 & 9 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 10 & 0 & 0 & 0 & 11 & 20 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 39 & 2 & 0 & 45 & 2 & 0 & 1 & 1 & 0 & 4 & 1 & 34 & 0 & 0 & 0 & 35 & 84 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 8.9 & 86.7 & 4.4 & 0 & & 50 & 0 & 25 & 25 & 0 & & 2.9 & 97.1 & 0 & 0 & 0 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 333 & . 750 & . 500 & . 000 & . 750 & . 250 & . 000 & . 250 & . 250 & . 000 & . 333 & . 250 & . 850 & . 000 & . 000 & . 000 & . 795 & . 840 \\
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N/S: Gurney Street/Terrace Street
E/W/NE: Trempont Street/ Mid Block Cross
City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey

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Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143755 A
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Gurney Street From North} & \multicolumn{5}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Terrace Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
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\hline 07:00 AM & 0 & 0 & 0 & 0 & 21 & 0 & 0 & 0 & 0 & 32 & 0 & 0 & 1 & 0 & 22 & 0 & 0 & 0 & 0 & 21 & 0 & 0 & 0 & 0 & 1 & 98 \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 34 & 0 & 0 & 0 & 0 & 37 & 0 & 1 & 2 & 0 & 21 & 1 & 0 & 0 & 0 & 43 & 0 & 1 & 0 & 0 & 9 & 149 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 27 & 0 & 0 & 0 & 0 & 18 & 0 & 2 & 1 & 0 & 15 & 0 & 0 & 1 & 0 & 51 & 0 & 0 & 0 & 0 & 8 & 123 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 24 & 0 & 0 & 0 & 0 & 33 & 0 & 0 & 0 & 0 & 18 & 0 & 0 & 0 & 0 & 57 & 0 & 0 & 0 & 0 & 9 & 141 \\
\hline Total & 0 & 0 & 0 & 0 & 106 & 0 & 0 & 0 & 0 & 120 & 0 & 3 & 4 & 0 & 76 & 1 & 0 & 1 & 0 & 172 & 0 & 1 & 0 & 0 & 27 & 511 \\
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\hline 08:00 AM & 0 & 0 & 0 & 0 & 17 & 0 & 0 & 0 & 0 & 32 & 0 & 0 & 0 & 0 & 24 & 0 & 0 & 0 & 0 & 63 & 0 & 0 & 0 & 0 & 15 & 151 \\
\hline 08:15 AM & 0 & 0 & 0 & 0 & 23 & 0 & 0 & 0 & 0 & 18 & 0 & 0 & 4 & 0 & 30 & 0 & 0 & 3 & 0 & 69 & 0 & 0 & 0 & 0 & 8 & 155 \\
\hline 08:30 AM & 0 & 0 & 0 & 0 & 25 & 0 & 0 & 0 & 0 & 15 & 0 & 0 & 0 & 0 & 21 & 0 & 0 & 0 & 0 & 62 & 0 & 1 & 0 & 0 & 8 & 132 \\
\hline 08:45 AM & 0 & 0 & 0 & 0 & 24 & 0 & 0 & 0 & 0 & 10 & 0 & 0 & 0 & 1 & 25 & 0 & 0 & 2 & 1 & 64 & 0 & 1 & 0 & 0 & 16 & 144 \\
\hline Total & 0 & 0 & 0 & 0 & 89 & 0 & 0 & 0 & 0 & 75 & 0 & 0 & 4 & 1 & 100 & 0 & 0 & 5 & 1 & 258 & 0 & 2 & 0 & 0 & 47 & 582 \\
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Grand Total & 0 & 0 & 0 & 0 & 195 & 0 & 0 & 0 & 0 & 195 & 0 & 3 & 8 & 1 & 176 & 1 & 0 & 6 & 1 & 430 & 0 & 3 & 0 & 0 & 74 & 1093 \\
Apprch \% & 0 & 0 & 0 & 0 & 100 & 0 & 0 & 0 & 0 & 100 & 0 & 1.6 & 4.3 & 0.5 & 93.6 & 0.2 & 0 & 1.4 & 0.2 & 98.2 & 0 & 3.9 & 0 & 0 & 96.1 &
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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
\end{tabular}} \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 17 & 17 & 0 & 0 & 0 & 0 & 32 & 32 & 0 & 0 & 0 & 0 & 24 & 24 & 0 & 0 & 0 & 0 & 63 & 63 & 0 & 0 & 0 & 0 & 15 & 15 & 151 \\
\hline 08:15 AM & 0 & 0 & 0 & 0 & 23 & 23 & 0 & 0 & 0 & 0 & 18 & 18 & 0 & 0 & 4 & 0 & 30 & 34 & 0 & 0 & 3 & 0 & 69 & 72 & 0 & 0 & 0 & 0 & 8 & 8 & 155 \\
\hline 08:30 AM & 0 & 0 & 0 & 0 & 25 & 25 & 0 & 0 & 0 & 0 & 15 & 15 & 0 & 0 & 0 & 0 & 21 & 21 & 0 & 0 & 0 & 0 & 62 & 62 & 0 & 1 & 0 & 0 & 8 & 9 & 132 \\
\hline 08:45 AM & 0 & 0 & 0 & 0 & 24 & 24 & 0 & 0 & 0 & 0 & 10 & 10 & 0 & 0 & 0 & 1 & 25 & 26 & 0 & 0 & 2 & 1 & 64 & 67 & 0 & 1 & 0 & 0 & 16 & 17 & 144 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 89 & 89 & 0 & 0 & 0 & 0 & 75 & 75 & 0 & 0 & 4 & 1 & 100 & 105 & 0 & 0 & 5 & 1 & 258 & 264 & 0 & 2 & 0 & 0 & 47 & 49 & 582 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 100 & & 0 & 0 & 0 & 0 & 100 & & 0 & 0 & 3.8 & 1 & 95.2 & & 0 & 0 & 1.9 & 0.4 & 97.7 & & 0 & 4.1 & 0 & 0 & 95.9 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 890 & . 890 & . 000 & . 000 & . 000 & . 000 & . 586 & . 586 & . 000 & . 000 & . 250 & . 250 & . 833 & . 772 & . 000 & . 000 & . 417 & . 250 & . 935 & . 917 & . 000 & . 500 & . 000 & . 000 & . 734 & . 721 & . 939 \\
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N/S: Gurney Street/Terrace Street
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File Name : 143755 A
Site Code : 13078
Start Date : 2/27/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \\
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\hline \multicolumn{32}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Lett Let} \\
\hline Peak Hour & for & Enti & re In & ers & ction & Beg & , & 07: & & & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 10 & 168 & 5 & 0 & 183 & 11 & 0 & 60 & 29 & 0 & 100 & 11 & 109 & 0 & 4 & 0 & 124 & 407 \\
\hline 07:30 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 140 & 7 & 0 & 160 & 4 & 0 & 60 & 33 & 0 & 97 & 20 & 107 & 0 & 1 & 0 & 128 & 385 \\
\hline 07:45 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 20 & 140 & 5 & 0 & 165 & 12 & 0 & 62 & 30 & 0 & 104 & 17 & 142 & 0 & 0 & 0 & 159 & 428 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 159 & 13 & 0 & 189 & 14 & 0 & 46 & 29 & 0 & 89 & 13 & 121 & 0 & 1 & 0 & 135 & 413 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 60 & 607 & 30 & 0 & 697 & 41 & 0 & 228 & 121 & 0 & 390 & 61 & 479 & 0 & 6 & 0 & 546 & 1633 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 8.6 & 87.1 & 4.3 & 0 & & 10.5 & 0 & 58.5 & 31 & 0 & & 11.2 & 87.7 & 0 & 1.1 & 0 & & \\
\hline PHF & 000 & 000 & 000 & . 000 & . 000 & . 000 & . 000 & . 000 & 000 & . 000 & 000 & . 000 & . 000 & . 750 & . 903 & . 577 & . 000 & . 922 & . 732 & . 000 & . 919 & . 917 & . 000 & . 938 & . 763 & . 843 & . 000 & 375 & . 000 & . 858 & . 954 \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 56 & 563 & 29 & 0 & 648 & 39 & 0 & 227 & 119 & 0 & 385 & 61 & 450 & 0 & 6 & 0 & 517 & 1550 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 93.3 & 92.8 & 96.7 & - & 93.0 & 95.1 & 0 & 99.6 & 98.3 & 0 & 98.7 & 100 & 93.9 & 0 & 100 & 0 & 94.7 & 94.9 \\
\hline Heary Venicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 44 & 1 & 0 & 49 & 2 & 0 & 1 & 2 & 0 & 5 & 0 & 29 & 0 & 0 & 0 & 29 & 83 \\
\hline \% Heavy Vehicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 6.7 & 7.2 & 3.3 & 0 & 7.0 & 4.9 & 0 & 0.4 & 1.7 & 0 & 1.3 & 0 & 6.1 & 0 & 0 & 0 & 5.3 & 5.1 \\
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File Name : 143755 AA
Site Code : 13078
Start Date : 2/27/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
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\hline 04:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 18 & 81 & 9 & 1 & 11 & 0 & 23 & 23 & 0 & 16 & 141 & 0 & 2 & 0 & 325 \\
\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 128 & 8 & 0 & 10 & 0 & 42 & 29 & 0 & 15 & 147 & 0 & 0 & 0 & 395 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 14 & 110 & 6 & 0 & 15 & 0 & 43 & 22 & 0 & 16 & 125 & 0 & 3 & 0 & 354 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 15 & 97 & 5 & 0 & 18 & 0 & 38 & 21 & 0 & 28 & 140 & 0 & 2 & 0 & 364 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 63 & 416 & 28 & 1 & 54 & 0 & 146 & 95 & 0 & 75 & 553 & 0 & 7 & 0 & 1438 \\
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 88 & 10 & 0 & 12 & 0 & 37 & 23 & 0 & 21 & 138 & 0 & 0 & 0 & 342 \\
\hline 05:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 86 & 14 & 0 & 11 & 0 & 45 & 19 & 0 & 19 & 138 & 0 & 0 & 0 & 349 \\
\hline 05:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 18 & 109 & 6 & 0 & 11 & 0 & 41 & 21 & 0 & 26 & 129 & 0 & 3 & 0 & 364 \\
\hline 05:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 11 & 113 & 8 & 0 & 7 & 0 & 33 & 24 & 0 & 17 & 146 & 0 & 5 & 0 & 364 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 59 & 396 & 38 & 0 & 41 & 0 & 156 & 87 & 0 & 83 & 551 & 0 & 8 & 0 & 1419 \\
\hline Grand Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 122 & 812 & 66 & 1 & 95 & 0 & 302 & 182 & 0 & 158 & 1104 & 0 & 15 & 0 & 2857 \\
\hline Apprch \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 12.2 & 81.1 & 6.6 & 0.1 & 16.4 & 0 & 52.2 & 31.4 & 0 & 12.4 & 86.5 & 0 & 1.2 & 0 & \\
\hline Total \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4.3 & 28.4 & 2.3 & 0 & 3.3 & 0 & 10.6 & 6.4 & 0 & 5.5 & 38.6 & 0 & 0.5 & 0 & \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 121 & 774 & 65 & 1 & 94 & 0 & 298 & 175 & 0 & 157 & 1062 & 0 & 15 & 0 & 2762 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 99.2 & 95.3 & 98.5 & 100 & 98.9 & 0 & 98.7 & 96.2 & 0 & 99.4 & 96.2 & 0 & 100 & 0 & 96.7 \\
\hline Heavy Vehicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 38 & 1 & 0 & 1 & 0 & 4 & 7 & 0 & 1 & 42 & 0 & 0 & 0 & 95 \\
\hline \% Heary Venicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0.8 & 4.7 & 1.5 & 0 & 1.1 & 0 & 1.3 & 3.8 & 0 & 0.6 & 3.8 & 0 & 0 & 0 & 3.3 \\
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 128 & 8 & 0 & 152 & 10 & 0 & 42 & 29 & 0 & 81 & 15 & 147 & 0 & 0 & 0 & 162 & 395 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 14 & 110 & 6 & 0 & 130 & 15 & 0 & 43 & 22 & 0 & 80 & 16 & 125 & 0 & 3 & 0 & 144 & 354 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 15 & 97 & 5 & 0 & 117 & 18 & 0 & 38 & 21 & 0 & 77 & 28 & 140 & 0 & 2 & 0 & 170 & 364 \\
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 88 & 10 & 0 & 111 & 12 & 0 & 37 & 23 & 0 & 72 & 21 & 138 & 0 & 0 & 0 & 159 & 342 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 58 & 423 & 29 & 0 & 510 & 55 & 0 & 160 & 95 & 0 & 310 & 80 & 550 & 0 & 5 & 0 & 635 & 1455 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 11.4 & 82.9 & 5.7 & 0 & & 17.7 & 0 & 51.6 & 30.6 & 0 & & 12.6 & 86.6 & 0 & 0.8 & 0 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 906 & . 826 & . 725 & . 000 & . 839 & . 764 & . 000 & . 930 & . 819 & . 000 & . 957 & . 714 & . 935 & . 000 & . 417 & . 000 & . 934 & . 921 \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 57 & 400 & 29 & 0 & 486 & 54 & 0 & 157 & 89 & 0 & 300 & 80 & 528 & 0 & 5 & 0 & 613 & 1399 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 98.3 & 94.6 & 100 & 0 & 95.3 & 98.2 & 0 & 98.1 & 93.7 & 0 & 96.8 & 100 & 96.0 & 0 & 100 & 0 & 96.5 & 96.2 \\
\hline Heary Venicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 23 & 0 & 0 & 24 & 1 & 0 & 3 & 6 & 0 & 10 & 0 & 22 & 0 & 0 & 0 & 22 & 56 \\
\hline \% Heary & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1.7 & 5.4 & 0 & 0 & 4.7 & 1.8 & 0 & 1.9 & 6.3 & 0 & 3.2 & 0 & 4.0 & 0 & 0 & 0 & 3.5 & 3.8 \\
\hline
\end{tabular}

N/S: Gurney Street/Terrace Street
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City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey

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File Name : 143755 AA
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 83 & 10 & 0 & 11 & 0 & 35 & 21 & 0 & 21 & 132 & 0 & 0 & 0 & 326 \\
\hline 05:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 84 & 13 & 0 & 11 & 0 & 45 & 19 & 0 & 19 & 137 & 0 & 0 & 0 & 345 \\
\hline 05:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 18 & 104 & 6 & 0 & 11 & 0 & 40 & 21 & 0 & 26 & 123 & 0 & 3 & 0 & 352 \\
\hline 05:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 11 & 108 & 8 & 0 & 7 & 0 & 33 & 24 & 0 & 17 & 143 & 0 & 5 & 0 & 356 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 59 & 379 & 37 & 0 & 40 & 0 & 153 & 85 & 0 & 83 & 535 & 0 & 8 & 0 & 1379 \\
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\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Grand Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 121 & 774 & 65 & 1 & 94 & 0 & 298 & 175 & 0 & 157 & 1062 & 0 & 15 & 0 & 2762 \\
\hline Apprch \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 12.6 & 80.5 & 6.8 & 0.1 & 16.6 & 0 & 52.6 & 30.9 & 0 & 12.7 & 86.1 & 0 & 1.2 & 0 & \\
\hline Total \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4.4 & 28 & 2.4 & 0 & 3.4 & 0 & 10.8 & 6.3 & 0 & 5.7 & 38.5 & 0 & 0.5 & 0 & \\
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\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \\
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\hline \multicolumn{32}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 15 & 124 & 8 & 0 & 147 & 10 & 0 & 41 & 28 & 0 & 79 & 15 & 139 & 0 & 0 & 0 & 154 & 380 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 14 & 103 & 6 & 0 & 123 & 15 & 0 & 43 & 20 & 0 & 78 & 16 & 121 & 0 & 3 & 0 & 140 & 341 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 15 & 90 & 5 & 0 & 110 & 18 & 0 & 38 & 20 & 0 & 76 & 28 & 136 & 0 & 2 & 0 & 166 & 352 \\
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 83 & 10 & 0 & 106 & 11 & 0 & 35 & 21 & 0 & 67 & 21 & 132 & 0 & 0 & 0 & 153 & 326 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 57 & 400 & 29 & 0 & 486 & 54 & 0 & 157 & 89 & 0 & 300 & 80 & 528 & 0 & 5 & 0 & 613 & 1399 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 11.7 & 82.3 & 6 & 0 & & 18 & 0 & 52.3 & 29.7 & 0 & & 13.1 & 86.1 & 0 & 0.8 & 0 & & \\
\hline PHF & . 000 & 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & 000 & . 950 & . 806 & . 725 & . 000 & . 827 & . 750 & . 000 & . 913 & . 795 & . 000 & . 949 & . 714 & . 950 & . 000 & . 417 & . 000 & . 923 & . 920 \\
\hline
\end{tabular}

N/S: Gurney Street/Terrace Street
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File Name : 143755 AA
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Gurney Street From North} & \multicolumn{5}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Terrace Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
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\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 4 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 8 & 0 & 0 & 0 & 15 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 0 & 4 & 0 & 0 & 0 & 13 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 4 & 0 & 0 & 0 & 12 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 21 & 0 & 0 & 0 & 0 & 1 & 5 & 0 & 1 & 26 & 0 & 0 & 0 & 55 \\
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& \(05: 00 ~ P M\) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 0 & 1 & 0 & 2 & 2 & 0 & 0 & 6 & 0 & 0 & 0 & 16 \\
\(05: 15 ~ P M ~\) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 4 \\
\(05: 30\) PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 6 & 0 & 0 & 0 & 12 \\
\(05: 45 ~ P M\) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 0 & 8 \\
\hline Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 17 & 1 & 0 & 1 & 0 & 3 & 2 & 0 & 0 & 16 & 0 & 0 & 0 & 40
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\begin{tabular}{r|rrrrr|rrrrr|rrrrr|rrrrrrrrrrrrrrrrr} 
Grand Total & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 38 & 1 & 0 & 1 & 0 & 4 & 7 & 0 & 1 & 42 & 0 & 0 & 0 & 95 \\
Apprch \% & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 2.5 & 95 & 2.5 & 0 & 8.3 & 0 & 33.3 & 58.3 & 0 & 2.3 & 97.7 & 0 & 0 & 0 &
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\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \multirow[b]{2}{*}{Int. Total} \\
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\hline \multicolumn{32}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1.0} \\
\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 4 & 0 & 0 & 5 & 0 & 0 & 1 & 1 & 0 & 2 & 0 & 8 & 0 & 0 & 0 & 8 & 15 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 7 & 0 & 0 & 0 & 2 & 0 & 2 & 0 & 4 & 0 & 0 & 0 & 4 & 13 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 7 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 4 & 0 & 0 & 0 & 4 & 12 \\
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 0 & 5 & 1 & 0 & 2 & 2 & 0 & 5 & 0 & 6 & 0 & 0 & 0 & 6 & 16 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 23 & 0 & 0 & 24 & 1 & 0 & 3 & 6 & 0 & 10 & 0 & 22 & 0 & 0 & 0 & 22 & 56 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 4.2 & 95.8 & 0 & 0 & & 10 & 0 & 30 & 60 & 0 & & 0 & 100 & 0 & 0 & 0 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 250 & . 821 & . 000 & . 000 & . 857 & . 250 & . 000 & . 375 & . 750 & . 000 & . 500 & . 000 & . 688 & . 000 & . 000 & . 000 & . 688 & . 875 \\
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\end{tabular}

N/S: Gurney Street/Terrace Street
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File Name : 143755 AA
Site Code : 13078
Start Date : 2/27/2014
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Gurney Street From North} & \multicolumn{5}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Terrace Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
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\hline 04:15 PM & 0 & 0 & 0 & 0 & 26 & 0 & 0 & 0 & 0 & 18 & 0 & 0 & 1 & 0 & 28 & 0 & 0 & 0 & 0 & 57 & 0 & 0 & 0 & 0 & 19 & 149 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 26 & 0 & 0 & 0 & 0 & 18 & 0 & 0 & 0 & 0 & 16 & 0 & 0 & 0 & 0 & 94 & 0 & 2 & 0 & 0 & 9 & 165 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 29 & 0 & 0 & 0 & 0 & 15 & 0 & 0 & 0 & 0 & 27 & 0 & 0 & 0 & 0 & 76 & 0 & 1 & 0 & 0 & 9 & 157 \\
\hline Total & 0 & 0 & 0 & 0 & 104 & 0 & 0 & 0 & 0 & 72 & 0 & 0 & 1 & 0 & 100 & 0 & 0 & 0 & 1 & 305 & 0 & 4 & 0 & 0 & 53 & 640 \\
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05:00 PM & 0 & 0 & 0 & 0 & 14 & 0 & 0 & 0 & 0 & 21 & 0 & 0 & 0 & 0 & 15 & 0 & 0 & 0 & 0 & 87 & 0 & 4 & 0 & 0 & 12 & 153 \\
\(05: 15 ~ P M ~\) & 0 & 0 & 0 & 0 & 17 & 0 & 0 & 0 & 0 & 20 & 0 & 0 & 0 & 0 & 23 & 0 & 0 & 0 & 0 & 88 & 0 & 1 & 0 & 0 & 16 & 165 \\
\(05: 30 ~ P M ~\) & 0 & 0 & 0 & 0 & 18 & 0 & 0 & 0 & 0 & 22 & 0 & 0 & 0 & 0 & 14 & 0 & 0 & 0 & 1 & 49 & 0 & 0 & 0 & 0 & 18 & 122 \\
\(05: 45 ~ P M ~\) & 0 & 0 & 0 & 0 & 24 & 0 & 0 & 0 & 0 & 28 & 0 & 0 & 1 & 0 & 18 & 0 & 0 & 0 & 0 & 77 & 2 & 1 & 0 & 0 & 23 & 174 \\
\hline Total & 0 & 0 & 0 & 0 & 73 & 0 & 0 & 0 & 0 & 91 & 0 & 0 & 1 & 0 & 70 & 0 & 0 & 0 & 1 & 301 & 2 & 6 & 0 & 0 & 69 & 614
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\begin{tabular}{r|rrrrr|rrrrr|rrrrr|rrrrrrrrrrrrrrrrr} 
Grand Total & 0 & 0 & 0 & 0 & 177 & 0 & 0 & 0 & 0 & 163 & 0 & 0 & 2 & 0 & 170 & 0 & 0 & 0 & 2 & 606 & 2 & 10 & 0 & 0 & 122 & 1254 \\
Apprch \% & 0 & 0 & 0 & 0 & 100 & 0 & 0 & 0 & 0 & 100 & 0 & 0 & 1.2 & 0 & 98.8 & 0 & 0 & 0 & 0.3 & 99.7 & 1.5 & 7.5 & 0 & 0 & 91 &
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\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \\
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\] & Thru & Left & Peds & App. & Right & Thru & \[
\begin{aligned}
& \text { Bear } \\
& \text { Letr }
\end{aligned}
\] & Left & Peds & \[
\begin{aligned}
& \hline \text { App. } \\
& \text { Total } \\
& \hline
\end{aligned}
\] & Int. Total \\
\hline \multicolumn{32}{|l|}{\begin{tabular}{l}
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
\end{tabular}} \\
\hline 04:00 PM & 0 & 0 & 0 & 0 & 23 & 23 & 0 & 0 & 0 & 0 & 21 & 21 & 0 & 0 & 0 & 0 & 29 & 29 & 0 & 0 & 0 & 1 & 78 & 79 & 0 & 1 & 0 & 0 & 16 & 17 & 169 \\
\hline 04:15 PM & 0 & 0 & 0 & 0 & 26 & 26 & 0 & 0 & 0 & 0 & 18 & 18 & 0 & 0 & 1 & 0 & 28 & 29 & 0 & 0 & 0 & 0 & 57 & 57 & 0 & 0 & 0 & 0 & 19 & 19 & 149 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 26 & 26 & 0 & 0 & 0 & 0 & 18 & 18 & 0 & 0 & 0 & 0 & 16 & 16 & 0 & 0 & 0 & 0 & 94 & 94 & 0 & 2 & 0 & 0 & 9 & 11 & 165 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 29 & 29 & 0 & 0 & 0 & 0 & 15 & 15 & 0 & 0 & 0 & 0 & 27 & 27 & 0 & 0 & 0 & 0 & 76 & 76 & 0 & 1 & 0 & 0 & 9 & 10 & 157 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 104 & 104 & 0 & 0 & 0 & 0 & 72 & 72 & 0 & 0 & 1 & 0 & 100 & 101 & 0 & 0 & 0 & 1 & 305 & 306 & 0 & 4 & 0 & 0 & 53 & 57 & 640 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 100 & & 0 & 0 & 0 & 0 & 100 & & 0 & 0 & 1 & 0 & 99 & & 0 & 0 & 0 & 0.3 & 99.7 & & 0 & 7 & 0 & 0 & 93 & & \\
\hline PHF & . 000 & . 000 & . 000 & . 000 & . 897 & . 897 & . 000 & . 000 & . 000 & . 000 & 857 & . 857 & . 000 & . 000 & . 250 & . 000 & . 862 & . 871 & . 000 & . 000 & . 000 & . 250 & . 811 & . 814 & . 000 & . 500 & . 000 & . 000 & . 697 & . 750 & . 947 \\
\hline
\end{tabular}

N/S: Gurney Street/Terrace Street
E/W/NE: Trempont Street/ Mid Block Cross
City, State: Roxbury, MA
Client: Howard Stein-Hudson/ S. Casey

D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143755 AA
Site Code : 13078
Start Date : 2/27/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{6}{|c|}{Gurney Street From North} & \multicolumn{6}{|c|}{Mid Block Crossing From Northeast} & \multicolumn{6}{|c|}{Tremont Street From East} & \multicolumn{6}{|c|}{Terrace Street From South} & \multicolumn{6}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & \begin{tabular}{c} 
Hard \\
Lett \\
\hline
\end{tabular} & \[
\begin{aligned}
& \text { u- } \\
& \text { Tum }
\end{aligned}
\] & App. Total & \begin{tabular}{l}
Hard \\
Right
\end{tabular} & \[
\begin{aligned}
& \text { Bear } \\
& \text { Right }
\end{aligned}
\] & Bear & Hard & Peds & App. Total & \begin{tabular}{l}
Hard \\
Right
\end{tabular} & Right & Thru & Left & \(\xrightarrow{\text { U. }}\) & \({ }^{\text {App. }}\) Total & Right & Bear Right & Thru & Left & \(\xrightarrow{\text { U. }}\) & App. Total & Right & Thru & Bear
Lett & Left &  & App. Total & Int. Total \\
\hline \multicolumn{32}{|l|}{} \\
\hline Peak Ho & ur for & Enti & re In & erse & ction & Beg & ins at & 04: & 15 & & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:15 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 128 & 8 & 0 & 152 & 10 & 0 & 42 & 29 & 0 & 81 & 15 & 147 & 0 & 0 & 0 & 162 & 395 \\
\hline 04:30 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 14 & 110 & 6 & 0 & 130 & 15 & 0 & 43 & 22 & 0 & 80 & 16 & 125 & 0 & 3 & 0 & 144 & 354 \\
\hline 04:45 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 15 & 97 & 5 & 0 & 117 & 18 & 0 & 38 & 21 & 0 & 77 & 28 & 140 & 0 & 2 & 0 & 170 & 364 \\
\hline 05:00 PM & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 13 & 88 & 10 & 0 & 111 & 12 & 0 & 37 & 23 & 0 & 72 & 21 & 138 & 0 & 0 & 0 & 159 & 342 \\
\hline Total Volume & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 58 & 423 & 29 & 0 & 510 & 55 & 0 & 160 & 95 & 0 & 310 & 80 & 550 & 0 & 5 & 0 & 635 & 1455 \\
\hline \% App. Total & 0 & 0 & 0 & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & & 0 & 11.4 & 82.9 & 5.7 & 0 & & 17.7 & 0 & 51.6 & 30.6 & 0 & & 12.6 & 86.6 & 0 & 0.8 & 0 & & \\
\hline PHF & . 000 & . 000 & 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 000 & . 906 & 826 & . 725 & . 000 & . 839 & . 764 & . 000 & . 930 & . 819 & . 000 & . 957 & . 714 & 935 & . 000 & 417 & . 000 & . 934 & 921 \\
\hline Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 57 & 400 & 29 & 0 & 486 & 54 & 0 & 157 & 89 & 0 & 300 & 80 & 528 & 0 & 5 & 0 & 613 & 1399 \\
\hline \% Cars & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 98.3 & 94.6 & 100 & 0 & 95.3 & 98.2 & 0 & 98.1 & 93.7 & 0 & 96.8 & 100 & 96.0 & 0 & 100 & 0 & 96.5 & 96.2 \\
\hline Hear V venicles & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 23 & 0 & 0 & 24 & 1 & 0 & 3 & 6 & 0 & 10 & 0 & 22 & 0 & 0 & 0 & 22 & 56 \\
\hline \% Heary Vehicies & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1.7 & 5.4 & 0 & 0 & 4.7 & 1.8 & 0 & 1.9 & 6.3 & 0 & 3.2 & 0 & 4.0 & 0 & 0 & 0 & 3.5 & 3.8 \\
\hline
\end{tabular}


N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC


File Name : 143866 A
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 13 & 22 & 30 & 0 & 48 & 110 & 15 & 0 & 0 & 0 & 0 & 0 & 7 & 119 & 9 & 0 & 373 \\
\hline 07:15 AM & 6 & 31 & 34 & 0 & 51 & 111 & 15 & 0 & 0 & 0 & 0 & 0 & 11 & 91 & 11 & 0 & 361 \\
\hline 07:30 AM & 5 & 35 & 38 & 0 & 68 & 122 & 15 & 0 & 0 & 0 & 0 & 0 & 10 & 101 & 12 & 0 & 406 \\
\hline 07:45 AM & 5 & 30 & 34 & 0 & 57 & 117 & 15 & 0 & 0 & 0 & 0 & 0 & 10 & 97 & 19 & 0 & 384 \\
\hline Total & 29 & 118 & 136 & 0 & 224 & 460 & 60 & 0 & 0 & 0 & 0 & 0 & 38 & 408 & 51 & 0 & 1524 \\
\hline 08:00 AM & 4 & 32 & 33 & 0 & 70 & 117 & 12 & 0 & 0 & 0 & 0 & 0 & 20 & 100 & 13 & 0 & 401 \\
\hline 08:15 AM & 8 & 33 & 24 & 0 & 58 & 109 & 20 & 0 & 0 & 0 & 0 & 0 & 7 & 80 & 13 & 0 & 352 \\
\hline 08:30 AM & 9 & 28 & 50 & 0 & 54 & 93 & 16 & 0 & 0 & 0 & 0 & 0 & 8 & 77 & 5 & 1 & 341 \\
\hline 08:45 AM & 6 & 21 & 36 & 0 & 64 & 108 & 12 & 0 & 0 & 0 & 0 & 0 & 9 & 86 & 7 & 0 & 349 \\
\hline Total & 27 & 114 & 143 & 0 & 246 & 427 & 60 & 0 & 0 & 0 & 0 & 0 & 44 & 343 & 38 & 1 & 1443 \\
\hline Grand Total & 56 & 232 & 279 & 0 & 470 & 887 & 120 & 0 & 0 & 0 & 0 & 0 & 82 & 751 & 89 & 1 & 2967 \\
\hline Apprch \% & 9.9 & 40.9 & 49.2 & 0 & 31.8 & 60.1 & 8.1 & 0 & 0 & 0 & 0 & 0 & 8.9 & 81.4 & 9.6 & 0.1 & \\
\hline Total \% & 1.9 & 7.8 & 9.4 & 0 & 15.8 & 29.9 & 4 & 0 & 0 & 0 & 0 & 0 & 2.8 & 25.3 & 3 & 0 & \\
\hline Cars & 51 & 217 & 269 & 0 & 460 & 797 & 103 & 0 & 0 & 0 & 0 & 0 & 78 & 687 & 84 & 1 & 2747 \\
\hline \% Cars & 91.1 & 93.5 & 96.4 & 0 & 97.9 & 89.9 & 85.8 & 0 & 0 & 0 & 0 & 0 & 95.1 & 91.5 & 94.4 & 100 & 92.6 \\
\hline Heavy Vehicles & 5 & 15 & 10 & 0 & 10 & 90 & 17 & 0 & 0 & 0 & 0 & 0 & 4 & 64 & 5 & 0 & 220 \\
\hline \% Heavy Vehicles & 8.9 & 6.5 & 3.6 & 0 & 2.1 & 10.1 & 14.2 & 0 & 0 & 0 & 0 & 0 & 4.9 & 8.5 & 5.6 & 0 & 7.4 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:15 AM & 6 & 31 & 34 & 0 & 71 & 51 & 111 & 15 & 0 & 177 & 0 & 0 & 0 & 0 & 0 & 11 & 91 & 11 & 0 & 113 & 361 \\
\hline 07:30 AM & 5 & 35 & 38 & 0 & 78 & 68 & 122 & 15 & 0 & 205 & 0 & 0 & 0 & 0 & 0 & 10 & 101 & 12 & 0 & 123 & 406 \\
\hline 07:45 AM & 5 & 30 & 34 & 0 & 69 & 57 & 117 & 15 & 0 & 189 & 0 & 0 & 0 & 0 & 0 & 10 & 97 & 19 & 0 & 126 & 384 \\
\hline 08:00 AM & 4 & 32 & 33 & 0 & 69 & 70 & 117 & 12 & 0 & 199 & 0 & 0 & 0 & 0 & 0 & 20 & 100 & 13 & 0 & 133 & 401 \\
\hline Total Volume & 20 & 128 & 139 & 0 & 287 & 246 & 467 & 57 & 0 & 770 & 0 & 0 & 0 & 0 & 0 & 51 & 389 & 55 & 0 & 495 & 1552 \\
\hline \% App. Total & 7 & 44.6 & 48.4 & 0 & & 31.9 & 60.6 & 7.4 & 0 & & 0 & 0 & 0 & 0 & & 10.3 & 78.6 & 11.1 & 0 & & \\
\hline PHF & . 833 & . 914 & . 914 & . 000 & . 920 & . 879 & . 957 & . 950 & . 000 & . 939 & . 000 & . 000 & . 000 & . 000 & . 000 & . 638 & . 963 & . 724 & . 000 & . 930 & . 956 \\
\hline Cars & 16 & 119 & 133 & 0 & 268 & 243 & 417 & 50 & 0 & 710 & 0 & 0 & 0 & 0 & 0 & 50 & 356 & 52 & 0 & 458 & 1436 \\
\hline \% Cars & 80.0 & 93.0 & 95.7 & 0 & 93.4 & 98.8 & 89.3 & 87.7 & 0 & 92.2 & 0 & 0 & 0 & 0 & 0 & 98.0 & 91.5 & 94.5 & 0 & 92.5 & 92.5 \\
\hline Heavy Vehicles & 4 & 9 & 6 & 0 & 19 & 3 & 50 & 7 & 0 & 60 & 0 & 0 & 0 & 0 & 0 & 1 & 33 & 3 & 0 & 37 & 116 \\
\hline \% Heavy Vehicles & 20.0 & 7.0 & 4.3 & 0 & 6.6 & 1.2 & 10.7 & 12.3 & 0 & 7.8 & 0 & 0 & 0 & 0 & 0 & 2.0 & 8.5 & 5.5 & 0 & 7.5 & 7.5 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email: datarequests@pdillc.com

File Name : 143866 A
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 13 & 21 & 30 & 0 & 46 & 94 & 13 & 0 & 0 & 0 & 0 & 0 & 6 & 110 & 9 & 0 & 342 \\
\hline 07:15 AM & 5 & 28 & 33 & 0 & 50 & 102 & 15 & 0 & 0 & 0 & 0 & 0 & 11 & 82 & 11 & 0 & 337 \\
\hline 07:30 AM & 4 & 32 & 36 & 0 & 67 & 109 & 14 & 0 & 0 & 0 & 0 & 0 & 10 & 96 & 11 & 0 & 379 \\
\hline 07:45 AM & 3 & 27 & 31 & 0 & 56 & 101 & 12 & 0 & 0 & 0 & 0 & 0 & 10 & 88 & 17 & 0 & 345 \\
\hline Total & 25 & 108 & 130 & 0 & 219 & 406 & 54 & 0 & 0 & 0 & 0 & 0 & 37 & 376 & 48 & 0 & 1403 \\
\hline 08:00 AM & 4 & 32 & 33 & 0 & 70 & 105 & 9 & 0 & 0 & 0 & 0 & 0 & 19 & 90 & 13 & 0 & 375 \\
\hline 08:15 AM & 8 & 32 & 23 & 0 & 57 & 98 & 18 & 0 & 0 & 0 & 0 & 0 & 6 & 74 & 13 & 0 & 329 \\
\hline 08:30 AM & 9 & 26 & 48 & 0 & 51 & 88 & 14 & 0 & 0 & 0 & 0 & 0 & 7 & 73 & 4 & 1 & 321 \\
\hline 08:45 AM & 5 & 19 & 35 & 0 & 63 & 100 & 8 & 0 & 0 & 0 & 0 & 0 & 9 & 74 & 6 & 0 & 319 \\
\hline Total & 26 & 109 & 139 & 0 & 241 & 391 & 49 & 0 & 0 & 0 & 0 & 0 & 41 & 311 & 36 & 1 & 1344 \\
\hline Grand Total & 51 & 217 & 269 & 0 & 460 & 797 & 103 & 0 & 0 & 0 & 0 & 0 & 78 & 687 & 84 & 1 & 2747 \\
\hline Apprch \% & 9.5 & 40.4 & 50.1 & 0 & 33.8 & 58.6 & 7.6 & 0 & 0 & 0 & 0 & 0 & 9.2 & 80.8 & 9.9 & 0.1 & \\
\hline Total \% & 1.9 & 7.9 & 9.8 & 0 & 16.7 & 29 & 3.7 & 0 & 0 & 0 & 0 & 0 & 2.8 & 25 & 3.1 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:15 AM & 5 & 28 & 33 & 0 & 66 & 50 & 102 & 15 & 0 & 167 & 0 & 0 & 0 & 0 & 0 & 11 & 82 & 11 & 0 & 104 & 337 \\
\hline 07:30 AM & 4 & 32 & 36 & 0 & 72 & 67 & 109 & 14 & 0 & 190 & 0 & 0 & 0 & 0 & 0 & 10 & 96 & 11 & 0 & 117 & 379 \\
\hline 07:45 AM & 3 & 27 & 31 & 0 & 61 & 56 & 101 & 12 & 0 & 169 & 0 & 0 & 0 & 0 & 0 & 10 & 88 & 17 & 0 & 115 & 345 \\
\hline 08:00 AM & 4 & 32 & 33 & 0 & 69 & 70 & 105 & 9 & 0 & 184 & 0 & 0 & 0 & 0 & 0 & 19 & 90 & 13 & 0 & 122 & 375 \\
\hline Total Volume & 16 & 119 & 133 & 0 & 268 & 243 & 417 & 50 & 0 & 710 & 0 & 0 & 0 & 0 & 0 & 50 & 356 & 52 & 0 & 458 & 1436 \\
\hline \% App. Total & 6 & 44.4 & 49.6 & 0 & & 34.2 & 58.7 & 7 & 0 & & 0 & 0 & 0 & 0 & & 10.9 & 77.7 & 11.4 & 0 & & \\
\hline PHF & . 800 & . 930 & . 924 & . 000 & . 931 & . 868 & . 956 & . 833 & . 000 & . 934 & . 000 & . 000 & . 000 & . 000 & . 000 & . 658 & . 927 & . 765 & . 000 & . 939 & . 947 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 A
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 0 & 1 & 0 & 0 & 2 & 16 & 2 & 0 & 0 & 0 & 0 & 0 & 1 & 9 & 0 & 0 & 31 \\
\hline 07:15 AM & 1 & 3 & 1 & 0 & 1 & 9 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 0 & 0 & 24 \\
\hline 07:30 AM & 1 & 3 & 2 & 0 & 1 & 13 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 1 & 0 & 27 \\
\hline 07:45 AM & 2 & 3 & 3 & 0 & 1 & 16 & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 2 & 0 & 39 \\
\hline Total & 4 & 10 & 6 & 0 & 5 & 54 & 6 & 0 & 0 & 0 & 0 & 0 & 1 & 32 & 3 & 0 & 121 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 12 & 3 & 0 & 0 & 0 & 0 & 0 & 1 & 10 & 0 & 0 & 26 \\
\hline 08:15 AM & 0 & 1 & 1 & 0 & 1 & 11 & 2 & 0 & 0 & 0 & 0 & 0 & 1 & 6 & 0 & 0 & 23 \\
\hline 08:30 AM & 0 & 2 & 2 & 0 & 3 & 5 & 2 & 0 & 0 & 0 & 0 & 0 & 1 & 4 & 1 & 0 & 20 \\
\hline 08:45 AM & 1 & 2 & 1 & 0 & 1 & 8 & 4 & 0 & 0 & 0 & 0 & 0 & 0 & 12 & 1 & 0 & 30 \\
\hline Total & 1 & 5 & 4 & 0 & 5 & 36 & 11 & 0 & 0 & 0 & 0 & 0 & 3 & 32 & 2 & 0 & 99 \\
\hline Grand Total & 5 & 15 & 10 & 0 & 10 & 90 & 17 & 0 & 0 & 0 & 0 & 0 & 4 & 64 & 5 & 0 & 220 \\
\hline Apprch \% & 16.7 & 50 & 33.3 & 0 & 8.5 & 76.9 & 14.5 & 0 & 0 & 0 & 0 & 0 & 5.5 & 87.7 & 6.8 & 0 & \\
\hline Total \% & 2.3 & 6.8 & 4.5 & 0 & 4.5 & 40.9 & 7.7 & 0 & 0 & 0 & 0 & 0 & 1.8 & 29.1 & 2.3 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:00 AM & 0 & 1 & 0 & 0 & 1 & 2 & 16 & 2 & 0 & 20 & 0 & 0 & 0 & 0 & 0 & 1 & 9 & 0 & 0 & 10 & 31 \\
\hline 07:15 AM & 1 & 3 & 1 & 0 & 5 & 1 & 9 & 0 & 0 & 10 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 0 & 0 & 9 & 24 \\
\hline 07:30 AM & 1 & 3 & 2 & 0 & 6 & 1 & 13 & 1 & 0 & 15 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 1 & 0 & 6 & 27 \\
\hline 07:45 AM & 2 & 3 & 3 & 0 & 8 & 1 & 16 & 3 & 0 & 20 & 0 & 0 & 0 & 0 & 0 & 0 & 9 & 2 & 0 & 11 & 39 \\
\hline Total Volume & 4 & 10 & 6 & 0 & 20 & 5 & 54 & 6 & 0 & 65 & 0 & 0 & 0 & 0 & 0 & 1 & 32 & 3 & 0 & 36 & 121 \\
\hline \% App. Total & 20 & 50 & 30 & 0 & & 7.7 & 83.1 & 9.2 & 0 & & 0 & 0 & 0 & 0 & & 2.8 & 88.9 & 8.3 & 0 & & \\
\hline PHF & . 500 & . 833 & . 500 & . 000 & . 625 & . 625 & . 844 & . 500 & . 000 & . 813 & . 000 & . 000 & . 000 & . 000 & . 000 & . 250 & . 889 & . 375 & . 000 & . 818 & . 776 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
\[
\text { P.O. Box } 301 \text { Berlin, MA } 01503
\]
\[
\begin{aligned}
& \text { P.O. Box } 301 \text { Berlin, MA } 01503 \\
& \text { Office:508.481.3999 Fax:508.545.1234 } \\
& \text { Email:datarequests@pdillc.com }
\end{aligned}
\]
Email:datarequests@pdillc.com

File Name : 143866 A
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Int. Total \\
\hline 07:00 AM & 0 & 0 & 0 & 13 & 1 & 3 & 0 & 1 & 0 & 0 & 0 & 27 & 0 & 0 & 1 & 7 & 53 \\
\hline 07:15 AM & 0 & 0 & 0 & 15 & 2 & 1 & 0 & 4 & 0 & 0 & 0 & 49 & 0 & 1 & 0 & 9 & 81 \\
\hline 07:30 AM & 0 & 0 & 0 & 28 & 3 & 6 & 0 & 18 & 0 & 0 & 0 & 59 & 0 & 0 & 1 & 21 & 136 \\
\hline 07:45 AM & 0 & 0 & 0 & 29 & 4 & 1 & 0 & 29 & 0 & 0 & 0 & 51 & 0 & 0 & 1 & 49 & 164 \\
\hline Total & 0 & 0 & 0 & 85 & 10 & 11 & 0 & 52 & 0 & 0 & 0 & 186 & 0 & 1 & 3 & 86 & 434 \\
\hline 08:00 AM & 0 & 0 & 1 & 16 & 2 & 2 & 0 & 12 & 0 & 0 & 0 & 57 & 0 & 1 & 1 & 10 & 102 \\
\hline 08:15 AM & 0 & 0 & 0 & 21 & 1 & 4 & 0 & 12 & 0 & 0 & 0 & 79 & 0 & 1 & 1 & 17 & 136 \\
\hline 08:30 AM & 0 & 0 & 0 & 21 & 6 & 2 & 0 & 9 & 0 & 0 & 0 & 79 & 0 & 5 & 0 & 24 & 146 \\
\hline 08:45 AM & 0 & 0 & 0 & 14 & 2 & 2 & 0 & 23 & 0 & 0 & 0 & 50 & 0 & 2 & 1 & 30 & 124 \\
\hline Total & 0 & 0 & 1 & 72 & 11 & 10 & 0 & 56 & 0 & 0 & 0 & 265 & 0 & 9 & 3 & 81 & 508 \\
\hline Grand Total & 0 & 0 & 1 & 157 & 21 & 21 & 0 & 108 & 0 & 0 & 0 & 451 & 0 & 10 & 6 & 167 & 942 \\
\hline Apprch \% & 0 & 0 & 0.6 & 99.4 & 14 & 14 & 0 & 72 & 0 & 0 & 0 & 100 & 0 & 5.5 & 3.3 & 91.3 & \\
\hline Total \% & 0 & 0 & 0.1 & 16.7 & 2.2 & 2.2 & 0 & 11.5 & 0 & 0 & 0 & 47.9 & 0 & 1.1 & 0.6 & 17.7 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{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} \\
\hline 07:45 AM & 0 & 0 & 0 & 29 & 29 & 4 & 1 & 0 & 29 & 34 & 0 & 0 & 0 & 51 & 51 & 0 & 0 & 1 & 49 & 50 & 164 \\
\hline 08:00 AM & 0 & 0 & 1 & 16 & 17 & 2 & 2 & 0 & 12 & 16 & 0 & 0 & 0 & 57 & 57 & 0 & 1 & 1 & 10 & 12 & 102 \\
\hline 08:15 AM & 0 & 0 & 0 & 21 & 21 & 1 & 4 & 0 & 12 & 17 & 0 & 0 & 0 & 79 & 79 & 0 & 1 & 1 & 17 & 19 & 136 \\
\hline 08:30 AM & 0 & 0 & 0 & 21 & 21 & 6 & 2 & 0 & 9 & 17 & 0 & 0 & 0 & 79 & 79 & 0 & 5 & 0 & 24 & 29 & 146 \\
\hline Total Volume & 0 & 0 & 1 & 87 & 88 & 13 & 9 & 0 & 62 & 84 & 0 & 0 & 0 & 266 & 266 & 0 & 7 & 3 & 100 & 110 & 548 \\
\hline \% App. Total & 0 & 0 & 1.1 & 98.9 & & 15.5 & 10.7 & 0 & 73.8 & & 0 & 0 & 0 & 100 & & 0 & 6.4 & 2.7 & 90.9 & & \\
\hline PHF & . 000 & . 000 & . 250 & . 750 & . 759 & . 542 & . 563 & . 000 & . 534 & . 618 & . 000 & . 000 & . 000 & . 842 & . 842 & . 000 & . 350 & . 750 & . 510 & . 550 & . 835 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 A
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 07:15 AM & 6 & 31 & 34 & 0 & 71 & 51 & 111 & 15 & 0 & 177 & 0 & 0 & 0 & 0 & 0 & 11 & 91 & 11 & 0 & 113 & 361 \\
\hline 07:30 AM & 5 & 35 & 38 & 0 & 78 & 68 & 122 & 15 & 0 & 205 & 0 & 0 & 0 & 0 & 0 & 10 & 101 & 12 & 0 & 123 & 406 \\
\hline 07:45 AM & 5 & 30 & 34 & 0 & 69 & 57 & 117 & 15 & 0 & 189 & 0 & 0 & 0 & 0 & 0 & 10 & 97 & 19 & 0 & 126 & 384 \\
\hline 08:00 AM & 4 & 32 & 33 & 0 & 69 & 70 & 117 & 12 & 0 & 199 & 0 & 0 & 0 & 0 & 0 & 20 & 100 & 13 & 0 & 133 & 401 \\
\hline Total Volume & 20 & 128 & 139 & 0 & 287 & 246 & 467 & 57 & 0 & 770 & 0 & 0 & 0 & 0 & 0 & 51 & 389 & 55 & 0 & 495 & 1552 \\
\hline \% App. Total & 7 & 44.6 & 48.4 & 0 & & 31.9 & 60.6 & 7.4 & 0 & & 0 & 0 & 0 & 0 & & 10.3 & 78.6 & 11.1 & 0 & & \\
\hline PHF & . 833 & . 914 & . 914 & . 000 & . 920 & . 879 & . 957 & . 950 & . 000 & . 939 & . 000 & . 000 & . 000 & . 000 & . 000 & . 638 & . 963 & . 724 & . 000 & . 930 & . 956 \\
\hline Cars & 16 & 119 & 133 & 0 & 268 & 243 & 417 & 50 & 0 & 710 & 0 & 0 & 0 & 0 & 0 & 50 & 356 & 52 & 0 & 458 & 1436 \\
\hline \% Cars & 80.0 & 93.0 & 95.7 & 0 & 93.4 & 98.8 & 89.3 & 87.7 & 0 & 92.2 & 0 & 0 & 0 & 0 & 0 & 98.0 & 91.5 & 94.5 & 0 & 92.5 & 92.5 \\
\hline Heavy Vehicles & 4 & 9 & 6 & 0 & 19 & 3 & 50 & 7 & 0 & 60 & 0 & 0 & 0 & 0 & 0 & 1 & 33 & 3 & 0 & 37 & 116 \\
\hline \% Heavy Vehicles & 20.0 & 7.0 & 4.3 & 0 & 6.6 & 1.2 & 10.7 & 12.3 & 0 & 7.8 & 0 & 0 & 0 & 0 & 0 & 2.0 & 8.5 & 5.5 & 0 & 7.5 & 7.5 \\
\hline
\end{tabular}


N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski


PRECISION
D A T A INDUSTRIES,LLC
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Email: datarequests@pdillc.com

File Name : 143866 AA
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Cars - Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 9 & 56 & 48 & 0 & 24 & 73 & 11 & 0 & 0 & 0 & 0 & 0 & 27 & 108 & 7 & 0 & 363 \\
\hline 04:15 PM & 6 & 57 & 53 & 0 & 33 & 82 & 7 & 0 & 1 & 0 & 0 & 0 & 19 & 117 & 10 & 0 & 385 \\
\hline 04:30 PM & 4 & 48 & 55 & 0 & 32 & 85 & 8 & 0 & 0 & 0 & 0 & 0 & 24 & 117 & 7 & 0 & 380 \\
\hline 04:45 PM & 3 & 51 & 29 & 0 & 25 & 82 & 18 & 1 & 0 & 0 & 0 & 0 & 22 & 93 & 10 & 0 & 334 \\
\hline Total & 22 & 212 & 185 & 0 & 114 & 322 & 44 & 1 & 1 & 0 & 0 & 0 & 92 & 435 & 34 & 0 & 1462 \\
\hline 05:00 PM & 5 & 64 & 45 & 0 & 27 & 97 & 12 & 0 & 0 & 0 & 0 & 0 & 25 & 126 & 10 & 0 & 411 \\
\hline 05:15 PM & 4 & 54 & 36 & 0 & 29 & 83 & 17 & 0 & 0 & 0 & 0 & 0 & 14 & 105 & 6 & 0 & 348 \\
\hline 05:30 PM & 7 & 68 & 42 & 0 & 20 & 118 & 12 & 0 & 0 & 0 & 0 & 0 & 15 & 119 & 5 & 0 & 406 \\
\hline 05:45 PM & 8 & 48 & 49 & 0 & 32 & 86 & 14 & 0 & 0 & 0 & 0 & 0 & 19 & 129 & 4 & 0 & 389 \\
\hline Total & 24 & 234 & 172 & 0 & 108 & 384 & 55 & 0 & 0 & 0 & 0 & 0 & 73 & 479 & 25 & 0 & 1554 \\
\hline Grand Total & 46 & 446 & 357 & 0 & 222 & 706 & 99 & 1 & 1 & 0 & 0 & 0 & 165 & 914 & 59 & 0 & 3016 \\
\hline Apprch \% & 5.4 & 52.5 & 42 & 0 & 21.6 & 68.7 & 9.6 & 0.1 & 100 & 0 & 0 & 0 & 14.5 & 80.3 & 5.2 & 0 & \\
\hline Total \% & 1.5 & 14.8 & 11.8 & 0 & 7.4 & 23.4 & 3.3 & 0 & 0 & 0 & 0 & 0 & 5.5 & 30.3 & 2 & 0 & \\
\hline Cars & 42 & 439 & 352 & 0 & 209 & 687 & 99 & 1 & 1 & 0 & 0 & 0 & 159 & 877 & 52 & 0 & 2918 \\
\hline \% Cars & 91.3 & 98.4 & 98.6 & 0 & 94.1 & 97.3 & 100 & 100 & 100 & 0 & 0 & 0 & 96.4 & 96 & 88.1 & 0 & 96.8 \\
\hline Heavy Vehicles & 4 & 7 & 5 & 0 & 13 & 19 & 0 & 0 & 0 & 0 & 0 & 0 & 6 & 37 & 7 & 0 & 98 \\
\hline \% Heavy Vehicles & 8.7 & 1.6 & 1.4 & 0 & 5.9 & 2.7 & 0 & 0 & 0 & 0 & 0 & 0 & 3.6 & 4 & 11.9 & 0 & 3.2 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1} \\
\hline Peak Hour for & Entir & Inter & ection & Begin & s at 05: & 0 PM & & & & & & & & & & & & & & & \\
\hline 05:00 PM & 5 & 64 & 45 & 0 & 114 & 27 & 97 & 12 & 0 & 136 & 0 & 0 & 0 & 0 & 0 & 25 & 126 & 10 & 0 & 161 & 411 \\
\hline 05:15 PM & 4 & 54 & 36 & 0 & 94 & 29 & 83 & 17 & 0 & 129 & 0 & 0 & 0 & 0 & 0 & 14 & 105 & 6 & 0 & 125 & 348 \\
\hline 05:30 PM & 7 & 68 & 42 & 0 & 117 & 20 & 118 & 12 & 0 & 150 & 0 & 0 & 0 & 0 & 0 & 15 & 119 & 5 & 0 & 139 & 406 \\
\hline 05:45 PM & 8 & 48 & 49 & 0 & 105 & 32 & 86 & 14 & 0 & 132 & 0 & 0 & 0 & 0 & 0 & 19 & 129 & 4 & 0 & 152 & 389 \\
\hline Total Volume & 24 & 234 & 172 & 0 & 430 & 108 & 384 & 55 & 0 & 547 & 0 & 0 & 0 & 0 & 0 & 73 & 479 & 25 & 0 & 577 & 1554 \\
\hline \% App. Total & 5.6 & 54.4 & 40 & 0 & & 19.7 & 70.2 & 10.1 & 0 & & 0 & 0 & 0 & 0 & & 12.7 & 83 & 4.3 & 0 & & \\
\hline PHF & . 750 & . 860 & . 878 & . 000 & . 919 & . 844 & . 814 & . 809 & . 000 & . 912 & . 000 & . 000 & . 000 & . 000 & . 000 & . 730 & . 928 & . 625 & . 000 & . 896 & . 945 \\
\hline Cars & 23 & 231 & 172 & 0 & 426 & 103 & 373 & 55 & 0 & 531 & 0 & 0 & 0 & 0 & 0 & 72 & 464 & 23 & 0 & 559 & 1516 \\
\hline \% Cars & 95.8 & 98.7 & 100 & 0 & 99.1 & 95.4 & 97.1 & 100 & 0 & 97.1 & 0 & 0 & 0 & 0 & 0 & 98.6 & 96.9 & 92.0 & 0 & 96.9 & 97.6 \\
\hline Heavy Vehicles & 1 & 3 & 0 & 0 & 4 & 5 & 11 & 0 & 0 & 16 & 0 & 0 & 0 & 0 & 0 & 1 & 15 & 2 & 0 & 18 & 38 \\
\hline \% Heavy Vehicles & 4.2 & 1.3 & 0 & 0 & 0.9 & 4.6 & 2.9 & 0 & 0 & 2.9 & 0 & 0 & 0 & 0 & 0 & 1.4 & 3.1 & 8.0 & 0 & 3.1 & 2.4 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email: datarequests@pdillc.com

File Name : 143866 AA
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 9 & 55 & 47 & 0 & 22 & 68 & 11 & 0 & 0 & 0 & 0 & 0 & 24 & 100 & 4 & 0 & 340 \\
\hline 04:15 PM & 5 & 56 & 52 & 0 & 31 & 80 & 7 & 0 & 1 & 0 & 0 & 0 & 18 & 114 & 9 & 0 & 373 \\
\hline 04:30 PM & 4 & 46 & 54 & 0 & 30 & 85 & 8 & 0 & 0 & 0 & 0 & 0 & 23 & 109 & 6 & 0 & 365 \\
\hline 04:45 PM & 1 & 51 & 27 & 0 & 23 & 81 & 18 & 1 & 0 & 0 & 0 & 0 & 22 & 90 & 10 & 0 & 324 \\
\hline Total & 19 & 208 & 180 & 0 & 106 & 314 & 44 & 1 & 1 & 0 & 0 & 0 & 87 & 413 & 29 & 0 & 1402 \\
\hline 05:00 PM & 5 & 64 & 45 & 0 & 26 & 94 & 12 & 0 & 0 & 0 & 0 & 0 & 24 & 125 & 8 & 0 & 403 \\
\hline 05:15 PM & 4 & 53 & 36 & 0 & 26 & 79 & 17 & 0 & 0 & 0 & 0 & 0 & 14 & 98 & 6 & 0 & 333 \\
\hline 05:30 PM & 6 & 67 & 42 & 0 & 20 & 116 & 12 & 0 & 0 & 0 & 0 & 0 & 15 & 115 & 5 & 0 & 398 \\
\hline 05:45 PM & 8 & 47 & 49 & 0 & 31 & 84 & 14 & 0 & 0 & 0 & 0 & 0 & 19 & 126 & 4 & 0 & 382 \\
\hline Total & 23 & 231 & 172 & 0 & 103 & 373 & 55 & 0 & 0 & 0 & 0 & 0 & 72 & 464 & 23 & 0 & 1516 \\
\hline Grand Total & 42 & 439 & 352 & 0 & 209 & 687 & 99 & 1 & 1 & 0 & 0 & 0 & 159 & 877 & 52 & 0 & 2918 \\
\hline Apprch \% & 5 & 52.7 & 42.3 & 0 & 21 & 69 & 9.9 & 0.1 & 100 & 0 & 0 & 0 & 14.6 & 80.6 & 4.8 & 0 & \\
\hline Total \% & 1.4 & 15 & 12.1 & 0 & 7.2 & 23.5 & 3.4 & 0 & 0 & 0 & 0 & 0 & 5.4 & 30.1 & 1.8 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline Peak Hour for & Entir & Inter & ection & Begin & & 0 PM & & & & & & & & & & & & & & & \\
\hline 05:00 PM & 5 & 64 & 45 & 0 & 114 & 26 & 94 & 12 & 0 & 132 & 0 & 0 & 0 & 0 & 0 & 24 & 125 & 8 & 0 & 157 & 403 \\
\hline 05:15 PM & 4 & 53 & 36 & 0 & 93 & 26 & 79 & 17 & 0 & 122 & 0 & 0 & 0 & 0 & 0 & 14 & 98 & 6 & 0 & 118 & 333 \\
\hline 05:30 PM & 6 & 67 & 42 & 0 & 115 & 20 & 116 & 12 & 0 & 148 & 0 & 0 & 0 & 0 & 0 & 15 & 115 & 5 & 0 & 135 & 398 \\
\hline 05:45 PM & 8 & 47 & 49 & 0 & 104 & 31 & 84 & 14 & 0 & 129 & 0 & 0 & 0 & 0 & 0 & 19 & 126 & 4 & 0 & 149 & 382 \\
\hline Total Volume & 23 & 231 & 172 & 0 & 426 & 103 & 373 & 55 & 0 & 531 & 0 & 0 & 0 & 0 & 0 & 72 & 464 & 23 & 0 & 559 & 1516 \\
\hline \% App. Total & 5.4 & 54.2 & 40.4 & 0 & & 19.4 & 70.2 & 10.4 & 0 & & 0 & 0 & 0 & 0 & & 12.9 & 83 & 4.1 & 0 & & \\
\hline PHF & . 719 & . 862 & . 878 & . 000 & . 926 & . 831 & . 804 & . 809 & . 000 & . 897 & . 000 & . 000 & . 000 & . 000 & . 000 & . 750 & . 921 & . 719 & . 000 & . 890 & . 940 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 AA
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Heavy Vehicles
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Right & Thru & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 0 & 1 & 1 & 0 & 2 & 5 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 8 & 3 & 0 & 23 \\
\hline 04:15 PM & 1 & 1 & 1 & 0 & 2 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 12 \\
\hline 04:30 PM & 0 & 2 & 1 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 8 & 1 & 0 & 15 \\
\hline 04:45 PM & 2 & 0 & 2 & 0 & 2 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 10 \\
\hline Total & 3 & 4 & 5 & 0 & 8 & 8 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 22 & 5 & 0 & 60 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline 05:00 PM & 0 & 0 & 0 & 0 & 1 & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 2 & 0 & 8 \\
\hline 05:15 PM & 0 & 1 & 0 & 0 & 3 & 4 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 7 & 0 & 0 & 15 \\
\hline 05:30 PM & 1 & 1 & 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 4 & 0 & 0 & 8 \\
\hline 05:45 PM & 0 & 1 & 0 & 0 & 1 & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 7 \\
\hline Total & 1 & 3 & 0 & 0 & 5 & 11 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 15 & 2 & 0 & 38 \\
\hline
\end{tabular}
\begin{tabular}{r|rrr|rrrr|rrrrrrrrrrrrr} 
Grand Total & 4 & 7 & 5 & 0 & 13 & 19 & 0 & 0 & 0 & 0 & 0 & 0 & 6 & 37 & 7 & 0 & 98 \\
Apprch \% & 25 & 43.8 & 31.2 & 0 & 40.6 & 59.4 & 0 & 0 & 0 & 0 & 0 & 0 & 12 & 74 & 14 & 0 & \\
Total \% & 4.1 & 7.1 & 5.1 & 0 & 13.3 & 19.4 & 0 & 0 & 0 & 0 & 0 & 0 & 6.1 & 37.8 & 7.1 & 0 &
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:00 PM & 0 & 1 & 1 & 0 & 2 & 2 & 5 & 0 & 0 & 7 & 0 & 0 & 0 & 0 & 0 & 3 & 8 & 3 & 0 & 14 & 23 \\
\hline 04:15 PM & 1 & 1 & 1 & 0 & 3 & 2 & 2 & 0 & 0 & 4 & 0 & 0 & 0 & 0 & 0 & 1 & 3 & 1 & 0 & 5 & 12 \\
\hline 04:30 PM & 0 & 2 & 1 & 0 & 3 & 2 & 0 & 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 1 & 8 & 1 & 0 & 10 & 15 \\
\hline 04:45 PM & 2 & 0 & 2 & 0 & 4 & 2 & 1 & 0 & 0 & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 3 & 10 \\
\hline Total Volume & 3 & 4 & 5 & 0 & 12 & 8 & 8 & 0 & 0 & 16 & 0 & 0 & 0 & 0 & 0 & 5 & 22 & 5 & 0 & 32 & 60 \\
\hline \% App. Total & 25 & 33.3 & 41.7 & 0 & & 50 & 50 & 0 & 0 & & 0 & 0 & 0 & 0 & & 15.6 & 68.8 & 15.6 & 0 & & \\
\hline PHF & . 375 & . 500 & . 625 & . 000 & . 750 & 1.00 & . 400 & . 000 & . 000 & . 571 & . 000 & . 000 & . 000 & . 000 & . 000 & . 417 & . 688 & . 417 & . 000 & . 571 & . 652 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 AA
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

Groups Printed- Peds and Bikes
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Tremont Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \multicolumn{4}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Right & Thru & Left & Peds & Int. Total \\
\hline 04:00 PM & 0 & 1 & 0 & 33 & 0 & 2 & 0 & 12 & 0 & 0 & 0 & 83 & 0 & 4 & 0 & 22 & 157 \\
\hline 04:15 PM & 0 & 0 & 1 & 22 & 0 & 0 & 0 & 6 & 1 & 0 & 0 & 74 & 0 & 2 & 0 & 37 & 143 \\
\hline 04:30 PM & 0 & 1 & 0 & 27 & 0 & 2 & 0 & 8 & 0 & 0 & 0 & 56 & 0 & 1 & 0 & 34 & 129 \\
\hline 04:45 PM & 1 & 3 & 1 & 37 & 2 & 2 & 0 & 19 & 0 & 0 & 0 & 70 & 0 & 2 & 0 & 28 & 165 \\
\hline Total & 1 & 5 & 2 & 119 & 2 & 6 & 0 & 45 & 1 & 0 & 0 & 283 & 0 & 9 & 0 & 121 & 594 \\
\hline 05:00 PM & 0 & 3 & 4 & 41 & 2 & 0 & 0 & 9 & 0 & 0 & 0 & 71 & 0 & 7 & 0 & 32 & 169 \\
\hline 05:15 PM & 0 & 4 & 2 & 36 & 0 & 2 & 0 & 18 & 0 & 0 & 0 & 81 & 1 & 3 & 0 & 37 & 184 \\
\hline 05:30 PM & 0 & 2 & 3 & 22 & 1 & 0 & 0 & 10 & 0 & 0 & 0 & 78 & 1 & 4 & 0 & 26 & 147 \\
\hline 05:45 PM & 1 & 2 & 0 & 10 & 0 & 2 & 0 & 13 & 0 & 0 & 0 & 76 & 1 & 6 & 0 & 35 & 146 \\
\hline Total & 1 & 11 & 9 & 109 & 3 & 4 & 0 & 50 & 0 & 0 & 0 & 306 & 3 & 20 & 0 & 130 & 646 \\
\hline Grand Total & 2 & 16 & 11 & 228 & 5 & 10 & 0 & 95 & 1 & 0 & 0 & 589 & 3 & 29 & 0 & 251 & 1240 \\
\hline Apprch \% & 0.8 & 6.2 & 4.3 & 88.7 & 4.5 & 9.1 & 0 & 86.4 & 0.2 & 0 & 0 & 99.8 & 1.1 & 10.2 & 0 & 88.7 & \\
\hline Total \% & 0.2 & 1.3 & 0.9 & 18.4 & 0.4 & 0.8 & 0 & 7.7 & 0.1 & 0 & 0 & 47.5 & 0.2 & 2.3 & 0 & 20.2 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Right & Thru & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & & & & & & & & & \\
\hline 04:45 PM & 1 & 3 & 1 & 37 & 42 & 2 & 2 & 0 & 19 & 23 & 0 & 0 & 0 & 70 & 70 & 0 & 2 & 0 & 28 & 30 & 165 \\
\hline 05:00 PM & 0 & 3 & 4 & 41 & 48 & 2 & 0 & 0 & 9 & 11 & 0 & 0 & 0 & 71 & 71 & 0 & 7 & 0 & 32 & 39 & 169 \\
\hline 05:15 PM & 0 & 4 & 2 & 36 & 42 & 0 & 2 & 0 & 18 & 20 & 0 & 0 & 0 & 81 & 81 & 1 & 3 & 0 & 37 & 41 & 184 \\
\hline 05:30 PM & 0 & 2 & 3 & 22 & 27 & 1 & 0 & 0 & 10 & 11 & 0 & 0 & 0 & 78 & 78 & 1 & 4 & 0 & 26 & 31 & 147 \\
\hline Total Volume & 1 & 12 & 10 & 136 & 159 & 5 & 4 & 0 & 56 & 65 & 0 & 0 & 0 & 300 & 300 & 2 & 16 & 0 & 123 & 141 & 665 \\
\hline \% App. Total & 0.6 & 7.5 & 6.3 & 85.5 & & 7.7 & 6.2 & 0 & 86.2 & & 0 & 0 & 0 & 100 & & 1.4 & 11.3 & 0 & 87.2 & & \\
\hline PHF & . 250 & . 750 & . 625 & . 829 & . 828 & . 625 & . 500 & . 000 & . 737 & . 707 & . 000 & . 000 & . 000 & . 926 & . 926 & . 500 & . 571 & . 000 & . 831 & . 860 & . 904 \\
\hline
\end{tabular}

N/S: Parker Street
E/W: Tremont Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A
INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234
Email:datarequests@pdillc.com

File Name : 143866 AA
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{5}{|c|}{Parker Street From North} & \multicolumn{5}{|c|}{Tremont Street From East} & \multicolumn{5}{|c|}{Parker Street From South} & \multicolumn{5}{|c|}{Tremont Street From West} & \\
\hline Start Time & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Right & Thru & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{22}{|l|}{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} \\
\hline 05:00 PM & 5 & 64 & 45 & 0 & 114 & 27 & 97 & 12 & 0 & 136 & 0 & 0 & 0 & 0 & 0 & 25 & 126 & 10 & 0 & 161 & 411 \\
\hline 05:15 PM & 4 & 54 & 36 & 0 & 94 & 29 & 83 & 17 & 0 & 129 & 0 & 0 & 0 & 0 & 0 & 14 & 105 & 6 & 0 & 125 & 348 \\
\hline 05:30 PM & 7 & 68 & 42 & 0 & 117 & 20 & 118 & 12 & 0 & 150 & 0 & 0 & 0 & 0 & 0 & 15 & 119 & 5 & 0 & 139 & 406 \\
\hline 05:45 PM & 8 & 48 & 49 & 0 & 105 & 32 & 86 & 14 & 0 & 132 & 0 & 0 & 0 & 0 & 0 & 19 & 129 & 4 & 0 & 152 & 389 \\
\hline Total Volume & 24 & 234 & 172 & 0 & 430 & 108 & 384 & 55 & 0 & 547 & 0 & 0 & 0 & 0 & 0 & 73 & 479 & 25 & 0 & 577 & 1554 \\
\hline \% App. Total & 5.6 & 54.4 & 40 & 0 & & 19.7 & 70.2 & 10.1 & 0 & & 0 & 0 & 0 & 0 & & 12.7 & 83 & 4.3 & 0 & & \\
\hline PHF & . 750 & . 860 & . 878 & . 000 & . 919 & . 844 & . 814 & . 809 & . 000 & . 912 & . 000 & . 000 & . 000 & . 000 & . 000 & . 730 & . 928 & . 625 & . 000 & . 896 & . 945 \\
\hline Cars & 23 & 231 & 172 & 0 & 426 & 103 & 373 & 55 & 0 & 531 & 0 & 0 & 0 & 0 & 0 & 72 & 464 & 23 & 0 & 559 & 1516 \\
\hline \% Cars & 95.8 & 98.7 & 100 & 0 & 99.1 & 95.4 & 97.1 & 100 & 0 & 97.1 & 0 & 0 & 0 & 0 & 0 & 98.6 & 96.9 & 92.0 & 0 & 96.9 & 97.6 \\
\hline Heavy Vehicles & 1 & 3 & 0 & 0 & 4 & 5 & 11 & 0 & 0 & 16 & 0 & 0 & 0 & 0 & 0 & 1 & 15 & 2 & 0 & 18 & 38 \\
\hline \% Heavy Vehicles & 4.2 & 1.3 & 0 & 0 & 0.9 & 4.6 & 2.9 & 0 & 0 & 2.9 & 0 & 0 & 0 & 0 & 0 & 1.4 & 3.1 & 8.0 & 0 & 3.1 & 2.4 \\
\hline
\end{tabular}


N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
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File Name : 143866 B
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars - Heavy Vehicles} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & \\
\hline 07:00 AM & 55 & 0 & 0 & 16 & 1 & 0 & 0 & 84 & 0 & 156 \\
\hline 07:15 AM & 65 & 0 & 0 & 31 & 3 & 0 & 1 & 80 & 0 & 180 \\
\hline 07:30 AM & 66 & 0 & 0 & 27 & 1 & 0 & 0 & 93 & 0 & 187 \\
\hline 07:45 AM & 64 & 0 & 0 & 24 & 2 & 0 & 0 & 95 & 0 & 185 \\
\hline Total & 250 & 0 & 0 & 98 & 7 & 0 & 1 & 352 & 0 & 708 \\
\hline 08:00 AM & 62 & 0 & 0 & 24 & 0 & 0 & 0 & 100 & 0 & 186 \\
\hline 08:15 AM & 75 & 1 & 0 & 26 & 3 & 0 & 0 & 93 & 0 & 198 \\
\hline 08:30 AM & 75 & 0 & 0 & 22 & 3 & 0 & 0 & 93 & 0 & 193 \\
\hline 08:45 AM & 61 & 0 & 0 & 25 & 1 & 0 & 0 & 78 & 0 & 165 \\
\hline Total & 273 & 1 & 0 & 97 & 7 & 0 & 0 & 364 & 0 & 742 \\
\hline Grand Total & 523 & 1 & 0 & 195 & 14 & 0 & 1 & 716 & 0 & 1450 \\
\hline Apprch \% & 99.8 & 0.2 & 0 & 93.3 & 6.7 & 0 & 0.1 & 99.9 & 0 & \\
\hline Total \% & 36.1 & 0.1 & 0 & 13.4 & 1 & 0 & 0.1 & 49.4 & 0 & \\
\hline Cars & 498 & 1 & 0 & 180 & 14 & 0 & 1 & 696 & 0 & 1390 \\
\hline \% Cars & 95.2 & 100 & 0 & 92.3 & 100 & 0 & 100 & 97.2 & 0 & 95.9 \\
\hline Heavy Vehicles & 25 & 0 & 0 & 15 & 0 & 0 & 0 & 20 & 0 & 60 \\
\hline \% Heavy Vehicles & 4.8 & 0 & 0 & 7.7 & 0 & 0 & 0 & 2.8 & 0 & 4.1 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & J-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & \\
\hline 07:45 AM & 64 & 0 & 0 & 64 & 24 & 2 & 0 & 26 & 0 & 95 & 0 & 95 & 185 \\
\hline 08:00 AM & 62 & 0 & 0 & 62 & 24 & 0 & 0 & 24 & 0 & 100 & 0 & 100 & 186 \\
\hline 08:15 AM & 75 & 1 & 0 & 76 & 26 & 3 & 0 & 29 & 0 & 93 & 0 & 93 & 198 \\
\hline 08:30 AM & 75 & 0 & 0 & 75 & 22 & 3 & 0 & 25 & 0 & 93 & 0 & 93 & 193 \\
\hline Total Volume & 276 & 1 & 0 & 277 & 96 & 8 & 0 & 104 & 0 & 381 & 0 & 381 & 762 \\
\hline \% App. Total & 99.6 & 0.4 & 0 & & 92.3 & 7.7 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & 920 & . 250 & . 000 & . 911 & . 923 & . 667 & . 000 & 897 & . 000 & . 953 & . 000 & 953 & 962 \\
\hline Cars & 264 & 1 & 0 & 265 & 89 & 8 & 0 & 97 & 0 & 370 & 0 & 370 & 732 \\
\hline \% Cars & 95.7 & 100 & 0 & 95.7 & 92.7 & 100 & 0 & 93.3 & 0 & 97.1 & 0 & 97.1 & 96.1 \\
\hline Heavy Vehicles & 12 & 0 & 0 & 12 & 7 & 0 & 0 & 7 & 0 & 11 & 0 & 11 & 30 \\
\hline \% Heavy Vehicles & 4.3 & 0 & 0 & 4.3 & 7.3 & 0 & 0 & 6.7 & 0 & 2.9 & 0 & 2.9 & 3.9 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

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Email:datarequests@pdillc.com

File Name : 143866 B
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & \\
\hline 07:00 AM & 53 & 0 & 0 & 14 & 1 & 0 & 0 & 81 & 0 & 149 \\
\hline 07:15 AM & 58 & 0 & 0 & 28 & 3 & 0 & 1 & 79 & 0 & 169 \\
\hline 07:30 AM & 64 & 0 & 0 & 26 & 1 & 0 & 0 & 91 & 0 & 182 \\
\hline 07:45 AM & 58 & 0 & 0 & 21 & 2 & 0 & 0 & 90 & 0 & 171 \\
\hline Total & 233 & 0 & 0 & 89 & 7 & 0 & 1 & 341 & 0 & 671 \\
\hline 08:00 AM & 60 & 0 & 0 & 22 & 0 & 0 & 0 & 99 & 0 & 181 \\
\hline 08:15 AM & 74 & 1 & 0 & 25 & 3 & 0 & 0 & 90 & 0 & 193 \\
\hline 08:30 AM & 72 & 0 & 0 & 21 & 3 & 0 & 0 & 91 & 0 & 187 \\
\hline 08:45 AM & 59 & 0 & 0 & 23 & 1 & 0 & 0 & 75 & 0 & 158 \\
\hline Total & 265 & 1 & 0 & 91 & 7 & 0 & 0 & 355 & 0 & 719 \\
\hline Grand Total & 498 & 1 & 0 & 180 & 14 & 0 & 1 & 696 & 0 & 1390 \\
\hline Apprch \% & 99.8 & 0.2 & 0 & 92.8 & 7.2 & 0 & 0.1 & 99.9 & 0 & \\
\hline Total \% & 35.8 & 0.1 & 0 & 12.9 & 1 & 0 & 0.1 & 50.1 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & \\
\hline 07:45 AM & 58 & 0 & 0 & 58 & 21 & 2 & 0 & 23 & 0 & 90 & 0 & 90 & 171 \\
\hline 08:00 AM & 60 & 0 & 0 & 60 & 22 & 0 & 0 & 22 & 0 & 99 & 0 & 99 & 181 \\
\hline 08:15 AM & 74 & 1 & 0 & 75 & 25 & 3 & 0 & 28 & 0 & 90 & 0 & 90 & 193 \\
\hline 08:30 AM & 72 & 0 & 0 & 72 & 21 & 3 & 0 & 24 & 0 & 91 & 0 & 91 & 187 \\
\hline Total Volume & 264 & 1 & 0 & 265 & 89 & 8 & 0 & 97 & 0 & 370 & 0 & 370 & 732 \\
\hline \% App. Total & 99.6 & 0.4 & 0 & & 91.8 & 8.2 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 892 & . 250 & . 000 & . 883 & . 890 & . 667 & . 000 & . 866 & . 000 & . 934 & . 000 & . 934 & . 948 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
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Office:508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 B
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Heavy Vehicles} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & \\
\hline 07:00 AM & 2 & 0 & 0 & 2 & 0 & 0 & 0 & 3 & 0 & 7 \\
\hline 07:15 AM & 7 & 0 & 0 & 3 & 0 & 0 & 0 & 1 & 0 & 11 \\
\hline 07:30 AM & 2 & 0 & 0 & 1 & 0 & 0 & 0 & 2 & 0 & 5 \\
\hline 07:45 AM & 6 & 0 & 0 & 3 & 0 & 0 & 0 & 5 & 0 & 14 \\
\hline Total & 17 & 0 & 0 & 9 & 0 & 0 & 0 & 11 & 0 & 37 \\
\hline 08:00 AM & 2 & 0 & 0 & 2 & 0 & 0 & 0 & 1 & 0 & 5 \\
\hline 08:15 AM & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 3 & 0 & 5 \\
\hline 08:30 AM & 3 & 0 & 0 & 1 & 0 & 0 & 0 & 2 & 0 & 6 \\
\hline 08:45 AM & 2 & 0 & 0 & 2 & 0 & 0 & 0 & 3 & 0 & 7 \\
\hline Total & 8 & 0 & 0 & 6 & 0 & 0 & 0 & 9 & 0 & 23 \\
\hline Grand Total & 25 & 0 & 0 & 15 & 0 & 0 & 0 & 20 & 0 & 60 \\
\hline Apprch \% & 100 & 0 & 0 & 100 & 0 & 0 & 0 & 100 & 0 & \\
\hline Total \% & 41.7 & 0 & 0 & 25 & 0 & 0 & 0 & 33.3 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1} \\
\hline Peak Hour for Entir & ersec & Begin & t 07:00 & & & & & & & & & & \\
\hline 07:00 AM & 2 & 0 & 0 & 2 & 2 & 0 & 0 & 2 & 0 & 3 & 0 & 3 & 7 \\
\hline 07:15 AM & 7 & 0 & 0 & 7 & 3 & 0 & 0 & 3 & 0 & 1 & 0 & 1 & 11 \\
\hline 07:30 AM & 2 & 0 & 0 & 2 & 1 & 0 & 0 & 1 & 0 & 2 & 0 & 2 & 5 \\
\hline 07:45 AM & 6 & 0 & 0 & 6 & 3 & 0 & 0 & 3 & 0 & 5 & 0 & 5 & 14 \\
\hline Total Volume & 17 & 0 & 0 & 17 & 9 & 0 & 0 & 9 & 0 & 11 & 0 & 11 & 37 \\
\hline \% App. Total & 100 & 0 & 0 & & 100 & 0 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 607 & . 000 & . 000 & . 607 & . 750 & . 000 & . 000 & . 750 & . 000 & . 550 & . 000 & . 550 & . 661 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
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File Name : 143866 B
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & Peds & Right & Left & Peds & Right & Thru & Peds & Int. Total \\
\hline 07:00 AM & 0 & 0 & 0 & 0 & 0 & 6 & 0 & 4 & 0 & 10 \\
\hline 07:15 AM & 0 & 0 & 0 & 0 & 0 & 14 & 0 & 2 & 0 & 16 \\
\hline 07:30 AM & 0 & 0 & 1 & 0 & 0 & 25 & 0 & 8 & 5 & 39 \\
\hline 07:45 AM & 0 & 0 & 2 & 1 & 0 & 28 & 0 & 10 & 0 & 41 \\
\hline Total & 0 & 0 & 3 & 1 & 0 & 73 & 0 & 24 & 5 & 106 \\
\hline 08:00 AM & 1 & 0 & 2 & 0 & 0 & 23 & 0 & 2 & 2 & 30 \\
\hline 08:15 AM & 0 & 0 & 1 & 0 & 0 & 18 & 0 & 0 & 0 & 19 \\
\hline 08:30 AM & 1 & 0 & 0 & 0 & 0 & 14 & 0 & 2 & 0 & 17 \\
\hline 08:45 AM & 0 & 0 & 1 & 0 & 1 & 22 & 0 & 4 & 2 & 30 \\
\hline Total & 2 & 0 & 4 & 0 & 1 & 77 & 0 & 8 & 4 & 96 \\
\hline Grand Total & 2 & 0 & 7 & 1 & 1 & 150 & 0 & 32 & 9 & 202 \\
\hline Apprch \% & 22.2 & 0 & 77.8 & 0.7 & 0.7 & 98.7 & 0 & 78 & 22 & \\
\hline Total \% & 1 & 0 & 3.5 & 0.5 & 0.5 & 74.3 & 0 & 15.8 & 4.5 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & Peds & App. Total & Right & Left & Peds & App. Total & Right & Thru & Peds & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1} \\
\hline Peak Hour for Entire & ersec & Begin & 07:30 & & & & & & & & & & \\
\hline 07:30 AM & 0 & 0 & 1 & 1 & 0 & 0 & 25 & 25 & 0 & 8 & 5 & 13 & 39 \\
\hline 07:45 AM & 0 & 0 & 2 & 2 & 1 & 0 & 28 & 29 & 0 & 10 & 0 & 10 & 41 \\
\hline 08:00 AM & 1 & 0 & 2 & 3 & 0 & 0 & 23 & 23 & 0 & 2 & 2 & 4 & 30 \\
\hline 08:15 AM & 0 & 0 & 1 & 1 & 0 & 0 & 18 & 18 & 0 & 0 & 0 & 0 & 19 \\
\hline Total Volume & 1 & 0 & 6 & 7 & 1 & 0 & 94 & 95 & 0 & 20 & 7 & 27 & 129 \\
\hline \% App. Total & 14.3 & 0 & 85.7 & & 1.1 & 0 & 98.9 & & 0 & 74.1 & 25.9 & & \\
\hline PHF & . 250 & . 000 & . 750 & . 583 & . 250 & . 000 & . 839 & . 819 & . 000 & . 500 & . 350 & . 519 & . 787 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
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ffice: 508.481.3999 Fax: 508.545.1234
Email: datarequests@pdillc.com

File Name : 143866 B
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 l} \\
\hline \multicolumn{14}{|l|}{Peak Hour for Entire Intersection Begins at 07:45 AM} \\
\hline 07:45 AM & 64 & 0 & 0 & 64 & 24 & 2 & 0 & 26 & 0 & 95 & 0 & 95 & 185 \\
\hline 08:00 AM & 62 & 0 & 0 & 62 & 24 & 0 & 0 & 24 & 0 & 100 & 0 & 100 & 186 \\
\hline 08:15 AM & 75 & 1 & 0 & 76 & 26 & 3 & 0 & 29 & 0 & 93 & 0 & 93 & 198 \\
\hline 08:30 AM & 75 & 0 & 0 & 75 & 22 & 3 & 0 & 25 & 0 & 93 & 0 & 93 & 193 \\
\hline Total Volume & 276 & 1 & 0 & 277 & 96 & 8 & 0 & 104 & 0 & 381 & 0 & 381 & 762 \\
\hline \% App. Total & 99.6 & 0.4 & 0 & & 92.3 & 7.7 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 920 & . 250 & . 000 & . 911 & . 923 & . 667 & . 000 & . 897 & . 000 & . 953 & . 000 & . 953 & . 962 \\
\hline Cars & 264 & 1 & 0 & 265 & 89 & 8 & 0 & 97 & 0 & 370 & 0 & 370 & 732 \\
\hline \% Cars & 95.7 & 100 & 0 & 95.7 & 92.7 & 100 & 0 & 93.3 & 0 & 97.1 & 0 & 97.1 & 96.1 \\
\hline Heavy Vehicles & 12 & 0 & 0 & 12 & 7 & 0 & 0 & 7 & 0 & 11 & 0 & 11 & 30 \\
\hline \% Heavy Vehicles & 4.3 & 0 & 0 & 4.3 & 7.3 & 0 & 0 & 6.7 & 0 & 2.9 & 0 & 2.9 & 3.9 \\
\hline
\end{tabular}


N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars - Heavy Vehicles} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & \\
\hline 04:00 PM & 89 & 0 & 0 & 23 & 2 & 0 & 0 & 52 & 0 & 166 \\
\hline 04:15 PM & 84 & 0 & 0 & 30 & 8 & 0 & 0 & 63 & 0 & 185 \\
\hline 04:30 PM & 73 & 0 & 0 & 32 & 5 & 0 & 0 & 51 & 0 & 161 \\
\hline 04:45 PM & 49 & 0 & 0 & 20 & 6 & 0 & 0 & 47 & 0 & 122 \\
\hline Total & 295 & 0 & 0 & 105 & 21 & 0 & 0 & 213 & 0 & 634 \\
\hline 05:00 PM & 102 & 0 & 0 & 27 & 4 & 0 & 0 & 45 & 0 & 178 \\
\hline 05:15 PM & 67 & 0 & 0 & 32 & 1 & 0 & 0 & 51 & 0 & 151 \\
\hline 05:30 PM & 87 & 0 & 0 & 26 & 3 & 0 & 0 & 41 & 0 & 157 \\
\hline 05:45 PM & 76 & 0 & 0 & 16 & 2 & 0 & 0 & 41 & 0 & 135 \\
\hline Total & 332 & 0 & 0 & 101 & 10 & 0 & 0 & 178 & 0 & 621 \\
\hline Grand Total & 627 & 0 & 0 & 206 & 31 & 0 & 0 & 391 & 0 & 1255 \\
\hline Apprch \% & 100 & 0 & 0 & 86.9 & 13.1 & 0 & 0 & 100 & 0 & \\
\hline Total \% & 50 & 0 & 0 & 16.4 & 2.5 & 0 & 0 & 31.2 & 0 & \\
\hline Cars & 612 & 0 & 0 & 204 & 31 & 0 & 0 & 367 & 0 & 1214 \\
\hline \% Cars & 97.6 & 0 & 0 & 99 & 100 & 0 & 0 & 93.9 & 0 & 96.7 \\
\hline Heavy Vehicles & 15 & 0 & 0 & 2 & 0 & 0 & 0 & 24 & 0 & 41 \\
\hline \% Heavy Vehicles & 2.4 & 0 & 0 & 1 & 0 & 0 & 0 & 6.1 & 0 & 3.3 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & \\
\hline 04:15 PM & 84 & 0 & 0 & 84 & 30 & 8 & 0 & 38 & 0 & 63 & 0 & 63 & 185 \\
\hline 04:30 PM & 73 & 0 & 0 & 73 & 32 & 5 & 0 & 37 & 0 & 51 & 0 & 51 & 161 \\
\hline 04:45 PM & 49 & 0 & 0 & 49 & 20 & 6 & 0 & 26 & 0 & 47 & 0 & 47 & 122 \\
\hline 05:00 PM & 102 & 0 & 0 & 102 & 27 & 4 & 0 & 31 & 0 & 45 & 0 & 45 & 178 \\
\hline Total Volume & 308 & 0 & 0 & 308 & 109 & 23 & & 132 & 0 & 206 & 0 & 206 & 646 \\
\hline \% App. Total & 100 & 0 & 0 & & 82.6 & 17.4 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 755 & . 000 & . 000 & . 755 & . 852 & . 719 & . 000 & . 868 & . 000 & . 817 & . 000 & . 817 & . 873 \\
\hline Cars & 300 & 0 & 0 & 300 & 107 & 23 & 0 & 130 & 0 & 193 & 0 & 193 & 623 \\
\hline \% Cars & 97.4 & 0 & 0 & 97.4 & 98.2 & 100 & 0 & 98.5 & 0 & 93.7 & 0 & 93.7 & 96.4 \\
\hline Heavy Vehicles & 8 & 0 & 0 & 8 & 2 & 0 & 0 & 2 & 0 & 13 & 0 & 13 & 23 \\
\hline \% Heavy Vehicles & 2.6 & 0 & 0 & 2.6 & 1.8 & 0 & 0 & 1.5 & 0 & 6.3 & 0 & 6.3 & 3.6 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234
Email:datarequests@pdillc.com

File Name : 143866 BB
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & \\
\hline 04:00 PM & 86 & 0 & 0 & 23 & 2 & 0 & 0 & 47 & 0 & 158 \\
\hline 04:15 PM & 81 & 0 & 0 & 30 & 8 & 0 & 0 & 58 & 0 & 177 \\
\hline 04:30 PM & 69 & 0 & 0 & 31 & 5 & 0 & 0 & 48 & 0 & 153 \\
\hline 04:45 PM & 48 & 0 & 0 & 20 & 6 & 0 & 0 & 44 & 0 & 118 \\
\hline Total & 284 & 0 & 0 & 104 & 21 & 0 & 0 & 197 & 0 & 606 \\
\hline 05:00 PM & 102 & 0 & 0 & 26 & 4 & 0 & 0 & 43 & 0 & 175 \\
\hline 05:15 PM & 65 & 0 & 0 & 32 & 1 & 0 & 0 & 48 & 0 & 146 \\
\hline 05:30 PM & 86 & 0 & 0 & 26 & 3 & 0 & 0 & 40 & 0 & 155 \\
\hline 05:45 PM & 75 & 0 & 0 & 16 & 2 & 0 & 0 & 39 & 0 & 132 \\
\hline Total & 328 & 0 & 0 & 100 & 10 & 0 & 0 & 170 & 0 & 608 \\
\hline Grand Total & 612 & 0 & 0 & 204 & 31 & 0 & 0 & 367 & 0 & 1214 \\
\hline Apprch \% & 100 & 0 & 0 & 86.8 & 13.2 & 0 & 0 & 100 & 0 & \\
\hline Total \% & 50.4 & 0 & 0 & 16.8 & 2.6 & 0 & 0 & 30.2 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & \\
\hline 04:15 PM & 81 & 0 & 0 & 81 & 30 & 8 & 0 & 38 & 0 & 58 & 0 & 58 & 177 \\
\hline 04:30 PM & 69 & 0 & 0 & 69 & 31 & 5 & 0 & 36 & 0 & 48 & 0 & 48 & 153 \\
\hline 04:45 PM & 48 & 0 & 0 & 48 & 20 & 6 & 0 & 26 & 0 & 44 & 0 & 44 & 118 \\
\hline 05:00 PM & 102 & 0 & 0 & 102 & 26 & 4 & 0 & 30 & 0 & 43 & 0 & 43 & 175 \\
\hline Total Volume & 300 & 0 & 0 & 300 & 107 & 23 & 0 & 130 & 0 & 193 & 0 & 193 & 623 \\
\hline \% App. Total & 100 & 0 & 0 & & 82.3 & 17.7 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 735 & . 000 & . 000 & . 735 & . 863 & . 719 & . 000 & . 855 & . 000 & . 832 & . 000 & . 832 & . 880 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Heavy Vehicles} & \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|c|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & Right & Left & U-Turn & Right & Thru & U-Turn & Int. Total \\
\hline 04:00 PM & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 8 \\
\hline 04:15 PM & 3 & 0 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 8 \\
\hline 04:30 PM & 4 & 0 & 0 & 1 & 0 & 0 & 0 & 3 & 0 & 8 \\
\hline 04:45 PM & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 4 \\
\hline Total & 11 & 0 & 0 & 1 & 0 & 0 & 0 & 16 & 0 & 28 \\
\hline 05:00 PM & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 2 & 0 & 3 \\
\hline 05:15 PM & 2 & 0 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 5 \\
\hline 05:30 PM & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 2 \\
\hline 05:45 PM & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 2 & 0 & 3 \\
\hline Total & 4 & 0 & 0 & 1 & 0 & 0 & 0 & 8 & 0 & 13 \\
\hline Grand Total & 15 & 0 & 0 & 2 & 0 & 0 & 0 & 24 & 0 & 41 \\
\hline Apprch \% & 100 & 0 & 0 & 100 & 0 & 0 & 0 & 100 & 0 & \\
\hline Total \% & 36.6 & 0 & 0 & 4.9 & 0 & 0 & 0 & 58.5 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{} \\
\hline \multicolumn{14}{|l|}{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} \\
\hline 04:00 PM & 3 & 0 & 0 & 3 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 5 & 8 \\
\hline 04:15 PM & 3 & 0 & 0 & 3 & 0 & 0 & 0 & 0 & 0 & 5 & 0 & 5 & 8 \\
\hline 04:30 PM & 4 & 0 & 0 & 4 & 1 & 0 & 0 & 1 & 0 & 3 & 0 & 3 & 8 \\
\hline 04:45 PM & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 3 & 4 \\
\hline Total Volume & 11 & 0 & 0 & 11 & 1 & 0 & 0 & 1 & 0 & 16 & 0 & 16 & 28 \\
\hline \% App. Total & 100 & 0 & 0 & & 100 & 0 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 688 & . 000 & . 000 & . 688 & . 250 & . 000 & . 000 & . 250 & . 000 & . 800 & . 000 & . 800 & . 875 \\
\hline
\end{tabular}

N/S: Parker Street
E: Station Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
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File Name : 143866 BB
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Peds and Bikes} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Parker Street From North} & \multicolumn{3}{|l|}{Station Street From East} & \multicolumn{3}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & Peds & Right & Left & Peds & Right & Thru & Peds & \\
\hline 04:00 PM & 2 & 0 & 0 & 0 & 0 & 22 & 0 & 0 & 2 & 26 \\
\hline 04:15 PM & 0 & 0 & 1 & 0 & 0 & 21 & 0 & 1 & 4 & 27 \\
\hline 04:30 PM & 0 & 0 & 2 & 0 & 0 & 14 & 0 & 1 & 4 & 21 \\
\hline 04:45 PM & 4 & 0 & 0 & 0 & 0 & 33 & 0 & 2 & 1 & 40 \\
\hline Total & 6 & 0 & 3 & 0 & 0 & 90 & 0 & 4 & 11 & 114 \\
\hline 05:00 PM & 4 & 0 & 0 & 1 & 0 & 45 & 0 & 2 & 2 & 54 \\
\hline 05:15 PM & 5 & 0 & 0 & 0 & 0 & 30 & 0 & 0 & 2 & 37 \\
\hline 05:30 PM & 3 & 0 & 3 & 0 & 0 & 27 & 0 & 4 & 5 & 42 \\
\hline 05:45 PM & 9 & 0 & 2 & 0 & 0 & 23 & 0 & 3 & 0 & 37 \\
\hline Total & 21 & 0 & 5 & 1 & 0 & 125 & 0 & 9 & 9 & 170 \\
\hline Grand Total & 27 & 0 & 8 & 1 & 0 & 215 & 0 & 13 & 20 & 284 \\
\hline Apprch \% & 77.1 & 0 & 22.9 & 0.5 & 0 & 99.5 & 0 & 39.4 & 60.6 & \\
\hline Total \% & 9.5 & 0 & 2.8 & 0.4 & 0 & 75.7 & 0 & 4.6 & 7 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & Peds & App. Total & Right & Left & Peds & App. Total & Right & Thru & Peds & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1} \\
\hline Peak Hour for Entir & ersec & Begin & \[
04: 45
\] & & & & & & & & & & \\
\hline 04:45 PM & 4 & 0 & 0 & 4 & 0 & 0 & 33 & 33 & 0 & 2 & 1 & 3 & 40 \\
\hline 05:00 PM & 4 & 0 & 0 & 4 & 1 & 0 & 45 & 46 & 0 & 2 & 2 & 4 & 54 \\
\hline 05:15 PM & 5 & 0 & 0 & 5 & 0 & 0 & 30 & 30 & 0 & 0 & 2 & 2 & 37 \\
\hline 05:30 PM & 3 & 0 & 3 & 6 & 0 & 0 & 27 & 27 & 0 & 4 & 5 & 9 & 42 \\
\hline Total Volume & 16 & 0 & 3 & 19 & 1 & 0 & 135 & 136 & 0 & 8 & 10 & 18 & 173 \\
\hline \% App. Total & 84.2 & 0 & 15.8 & & 0.7 & 0 & 99.3 & & 0 & 44.4 & 55.6 & & \\
\hline PHF & . 800 & . 000 & . 250 & . 792 & . 250 & . 000 & . 750 & . 739 & . 000 & . 500 & . 500 & . 500 & . 801 \\
\hline
\end{tabular}

N/S: Parker Street
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City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

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File Name : 143866 BB
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Parker Street From North} & \multicolumn{4}{|c|}{Station Street From East} & \multicolumn{4}{|c|}{Parker Street From South} & \\
\hline Start Time & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Right & Thru & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1} \\
\hline \multicolumn{14}{|l|}{Peak Hour for Entire Intersection Begins at 04:15 PM} \\
\hline 04:15 PM & 84 & 0 & 0 & 84 & 30 & 8 & 0 & 38 & 0 & 63 & 0 & 63 & 185 \\
\hline 04:30 PM & 73 & 0 & 0 & 73 & 32 & 5 & 0 & 37 & 0 & 51 & 0 & 51 & 161 \\
\hline 04:45 PM & 49 & 0 & 0 & 49 & 20 & 6 & 0 & 26 & 0 & 47 & 0 & 47 & 122 \\
\hline 05:00 PM & 102 & 0 & 0 & 102 & 27 & 4 & 0 & 31 & 0 & 45 & 0 & 45 & 178 \\
\hline Total Volume & 308 & 0 & 0 & 308 & 109 & 23 & 0 & 132 & 0 & 206 & 0 & 206 & 646 \\
\hline \% App. Total & 100 & 0 & 0 & & 82.6 & 17.4 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 755 & . 000 & . 000 & . 755 & . 852 & . 719 & . 000 & . 868 & . 000 & . 817 & . 000 & . 817 & . 873 \\
\hline Cars & 300 & 0 & 0 & 300 & 107 & 23 & 0 & 130 & 0 & 193 & 0 & 193 & 623 \\
\hline \% Cars & 97.4 & 0 & 0 & 97.4 & 98.2 & 100 & 0 & 98.5 & 0 & 93.7 & 0 & 93.7 & 96.4 \\
\hline Heavy Vehicles & 8 & 0 & 0 & 8 & 2 & 0 & 0 & 2 & 0 & 13 & 0 & 13 & 23 \\
\hline \% Heavy Vehicles & 2.6 & 0 & 0 & 2.6 & 1.8 & 0 & 0 & 1.5 & 0 & 6.3 & 0 & 6.3 & 3.6 \\
\hline
\end{tabular}


N/S: Tremont Street
W: Prentiss Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A
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Email:datarequests@pdillc.com

File Name : 143866 C
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & Thru & Left & U-Turn & Right & Left & U-Turn & Int. Total \\
\hline 07:00 AM & 24 & 171 & 8 & 331 & 68 & 0 & 6 & 29 & 0 & 637 \\
\hline 07:15 AM & 36 & 147 & 9 & 413 & 70 & 0 & 8 & 36 & 0 & 719 \\
\hline 07:30 AM & 25 & 163 & 11 & 383 & 101 & 0 & 11 & 30 & 0 & 724 \\
\hline 07:45 AM & 31 & 163 & 10 & 359 & 65 & 0 & 8 & 50 & 0 & 686 \\
\hline Total & 116 & 644 & 38 & 1486 & 304 & 0 & 33 & 145 & 0 & 2766 \\
\hline 08:00 AM & 43 & 196 & 6 & 358 & 75 & 0 & 10 & 32 & 0 & 720 \\
\hline 08:15 AM & 36 & 163 & 10 & 319 & 79 & 1 & 5 & 30 & 0 & 643 \\
\hline 08:30 AM & 34 & 171 & 8 & 340 & 64 & 0 & 6 & 26 & 0 & 649 \\
\hline 08:45 AM & 22 & 162 & 4 & 313 & 57 & 1 & 9 & 19 & 0 & 587 \\
\hline Total & 135 & 692 & 28 & 1330 & 275 & 2 & 30 & 107 & 0 & 2599 \\
\hline Grand Total & 251 & 1336 & 66 & 2816 & 579 & 2 & 63 & 252 & 0 & 5365 \\
\hline Apprch \% & 15.2 & 80.8 & 4 & 82.9 & 17 & 0.1 & 20 & 80 & 0 & \\
\hline Total \% & 4.7 & 24.9 & 1.2 & 52.5 & 10.8 & 0 & 1.2 & 4.7 & 0 & \\
\hline Cars & 225 & 1145 & 66 & 2580 & 567 & 2 & 62 & 233 & 0 & 4880 \\
\hline \% Cars & 89.6 & 85.7 & 100 & 91.6 & 97.9 & 100 & 98.4 & 92.5 & 0 & 91 \\
\hline Heavy Vehicles & 26 & 191 & 0 & 236 & 12 & 0 & 1 & 19 & 0 & 485 \\
\hline \% Heavy Vehicles & 10.4 & 14.3 & 0 & 8.4 & 2.1 & 0 & 1.6 & 7.5 & 0 & 9 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{\[
\begin{aligned}
& \text { Prentiss Street } \\
& \text { From West }
\end{aligned}
\]} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM}} \\
\hline & & & & & & & & & & & & & \\
\hline 07:15 AM & 36 & 147 & 9 & 192 & 413 & 70 & 0 & 483 & 8 & 36 & 0 & 44 & 719 \\
\hline 07:30 AM & 25 & 163 & 11 & 199 & 383 & 101 & 0 & 484 & 11 & 30 & 0 & 41 & 724 \\
\hline 07:45 AM & 31 & 163 & 10 & 204 & 359 & 65 & 0 & 424 & 8 & 50 & 0 & 58 & 686 \\
\hline 08:00 AM & 43 & 196 & 6 & 245 & 358 & 75 & 0 & 433 & 10 & 32 & 0 & 42 & 720 \\
\hline Total Volume & 135 & 669 & 36 & 840 & 1513 & 311 & 0 & 1824 & 37 & 148 & 0 & 185 & 2849 \\
\hline \% App. Total & 16.1 & 79.6 & 4.3 & & 82.9 & 17.1 & 0 & & 20 & 80 & 0 & & \\
\hline PHF & . 785 & . 853 & . 818 & . 857 & . 916 & . 770 & . 000 & . 942 & . 841 & . 740 & . 000 & . 797 & . 984 \\
\hline Cars & 121 & 570 & 36 & 727 & 1406 & 303 & 0 & 1709 & 36 & 138 & 0 & 174 & 2610 \\
\hline \% Cars & 89.6 & 85.2 & 100 & 86.5 & 92.9 & 97.4 & 0 & 93.7 & 97.3 & 93.2 & 0 & 94.1 & 91.6 \\
\hline Heavy Vehicles & 14 & 99 & 0 & 113 & 107 & 8 & 0 & 115 & 1 & 10 & 0 & 11 & 239 \\
\hline \% Heavy Vehicles & 10.4 & 14.8 & 0 & 13.5 & 7.1 & 2.6 & 0 & 6.3 & 2.7 & 6.8 & 0 & 5.9 & 8.4 \\
\hline
\end{tabular}

N/S: Tremont Street
W: Prentiss Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A
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File Name : 143866 C
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & Thru & Left & U-Turn & Right & Left & U-Turn & \\
\hline 07:00 AM & 21 & 153 & 8 & 281 & 66 & 0 & 6 & 26 & 0 & 561 \\
\hline 07:15 AM & 30 & 123 & 9 & 390 & 67 & 0 & 8 & 33 & 0 & 660 \\
\hline 07:30 AM & 24 & 132 & 11 & 360 & 99 & 0 & 11 & 29 & 0 & 666 \\
\hline 07:45 AM & 26 & 143 & 10 & 332 & 64 & 0 & 8 & 48 & 0 & 631 \\
\hline Total & 101 & 551 & 38 & 1363 & 296 & 0 & 33 & 136 & 0 & 2518 \\
\hline 08:00 AM & 41 & 172 & 6 & 324 & 73 & 0 & 9 & 28 & 0 & 653 \\
\hline 08:15 AM & 32 & 140 & 10 & 292 & 78 & 1 & 5 & 28 & 0 & 586 \\
\hline 08:30 AM & 30 & 148 & 8 & 318 & 64 & 0 & 6 & 25 & 0 & 599 \\
\hline 08:45 AM & 21 & 134 & 4 & 283 & 56 & 1 & 9 & 16 & 0 & 524 \\
\hline Total & 124 & 594 & 28 & 1217 & 271 & 2 & 29 & 97 & 0 & 2362 \\
\hline Grand Total & 225 & 1145 & 66 & 2580 & 567 & 2 & 62 & 233 & 0 & 4880 \\
\hline Apprch \% & 15.7 & 79.7 & 4.6 & 81.9 & 18 & 0.1 & 21 & 79 & 0 & \\
\hline Total \% & 4.6 & 23.5 & 1.4 & 52.9 & 11.6 & 0 & 1.3 & 4.8 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM}} \\
\hline & & & & & & & & & & & & & \\
\hline 07:15 AM & 30 & 123 & 9 & 162 & 390 & 67 & 0 & 457 & 8 & 33 & 0 & 41 & 660 \\
\hline 07:30 AM & 24 & 132 & 11 & 167 & 360 & 99 & 0 & 459 & 11 & 29 & 0 & 40 & 666 \\
\hline 07:45 AM & 26 & 143 & 10 & 179 & 332 & 64 & 0 & 396 & 8 & 48 & 0 & 56 & 631 \\
\hline 08:00 AM & 41 & 172 & 6 & 219 & 324 & 73 & 0 & 397 & 9 & 28 & 0 & 37 & 653 \\
\hline Total Volume & 121 & 570 & 36 & 727 & 1406 & 303 & 0 & 1709 & 36 & 138 & 0 & 174 & 2610 \\
\hline \% App. Total & 16.6 & 78.4 & 5 & & 82.3 & 17.7 & 0 & & 20.7 & 79.3 & 0 & & \\
\hline PHF & . 738 & . 828 & . 818 & . 830 & . 901 & . 765 & . 000 & . 931 & . 818 & . 719 & . 000 & . 777 & . 980 \\
\hline
\end{tabular}

N/S: Tremont Street
W: Prentiss Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
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File Name : 143866 C
Site Code : TBA
Start Date : 5/8/2014
Page No : 1

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 der} \\
\hline Peak Hour for Entire & ersecti & Begins & 07:00 & & & & & & & & & & \\
\hline 07:00 AM & 3 & 18 & 0 & 21 & 50 & 2 & 0 & 52 & 0 & 3 & 0 & 3 & 76 \\
\hline 07:15 AM & 6 & 24 & 0 & 30 & 23 & 3 & 0 & 26 & 0 & 3 & 0 & 3 & 59 \\
\hline 07:30 AM & 1 & 31 & 0 & 32 & 23 & 2 & 0 & 25 & 0 & 1 & 0 & 1 & 58 \\
\hline 07:45 AM & 5 & 20 & 0 & 25 & 27 & 1 & 0 & 28 & 0 & 2 & 0 & 2 & 55 \\
\hline Total Volume & 15 & 93 & 0 & 108 & 123 & 8 & 0 & 131 & 0 & 9 & 0 & 9 & 248 \\
\hline \% App. Total & 13.9 & 86.1 & 0 & & 93.9 & 6.1 & 0 & & 0 & 100 & 0 & & \\
\hline PHF & . 625 & . 750 & . 000 & . 844 & . 615 & . 667 & . 000 & . 630 & . 000 & . 750 & . 000 & . 750 & . 816 \\
\hline
\end{tabular}

N/S: Tremont Street
W: Prentiss Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES,LLC
P.O. Box 301 Berlin, MA 01503

Office: 508.481.3999 Fax: 508.545.1234 Email:datarequests@pdillc.com

File Name : 143866 C
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & Peds & Thru & Left & Peds & Right & Left & Peds & Int. Total \\
\hline 07:00 AM & 0 & 0 & 8 & 0 & 0 & 4 & 0 & 0 & 3 & 15 \\
\hline 07:15 AM & 0 & 0 & 3 & 0 & 0 & 6 & 0 & 0 & 4 & 13 \\
\hline 07:30 AM & 0 & 0 & 2 & 0 & 0 & 11 & 0 & 0 & 3 & 16 \\
\hline 07:45 AM & 0 & 0 & 7 & 2 & 0 & 3 & 0 & 0 & 5 & 17 \\
\hline Total & 0 & 0 & 20 & 2 & 0 & 24 & 0 & 0 & 15 & 61 \\
\hline 08:00 AM & 0 & 0 & 0 & 0 & 0 & 3 & 0 & 0 & 1 & 4 \\
\hline 08:15 AM & 0 & 0 & 6 & 0 & 1 & 2 & 0 & 0 & 1 & 10 \\
\hline 08:30 AM & 0 & 0 & 2 & 0 & 0 & 4 & 0 & 0 & 1 & 7 \\
\hline 08:45 AM & 0 & 0 & 2 & 0 & 0 & 0 & 0 & 0 & 7 & 9 \\
\hline Total & 0 & 0 & 10 & 0 & 1 & 9 & 0 & 0 & 10 & 30 \\
\hline Grand Total & 0 & 0 & 30 & 2 & 1 & 33 & 0 & 0 & 25 & 91 \\
\hline Apprch \% & 0 & 0 & 100 & 5.6 & 2.8 & 91.7 & 0 & 0 & 100 & \\
\hline Total \% & 0 & 0 & 33 & 2.2 & 1.1 & 36.3 & 0 & 0 & 27.5 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & Peds & App. Total & Thru & Left & Peds & App. Total & Right & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 Amper} \\
\hline Peak Hour for Entire & ersectio & Begins & 07:00 & & & & & & & & & & \\
\hline 07:00 AM & 0 & 0 & 8 & 8 & 0 & 0 & 4 & 4 & 0 & 0 & 3 & 3 & 15 \\
\hline 07:15 AM & 0 & 0 & 3 & 3 & 0 & 0 & 6 & 6 & 0 & 0 & 4 & 4 & 13 \\
\hline 07:30 AM & 0 & 0 & 2 & 2 & 0 & 0 & 11 & 11 & 0 & 0 & 3 & 3 & 16 \\
\hline 07:45 AM & 0 & 0 & 7 & 7 & 2 & 0 & 3 & 5 & 0 & 0 & 5 & 5 & 17 \\
\hline Total Volume & 0 & 0 & 20 & 20 & 2 & 0 & 24 & 26 & 0 & 0 & 15 & 15 & 61 \\
\hline \% App. Total & 0 & 0 & 100 & & 7.7 & 0 & 92.3 & & 0 & 0 & 100 & & \\
\hline PHF & . 000 & . 000 & . 625 & . 625 & . 250 & . 000 & . 545 & . 591 & . 000 & . 000 & . 750 & . 750 & . 897 \\
\hline
\end{tabular}

N/S: Tremont Street
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File Name : 143866 C
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Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1} \\
\hline Peak Hour for Entire & ersectio & Begin & 07:15 & & & & & & & & & & \\
\hline 07:15 AM & 36 & 147 & 9 & 192 & 413 & 70 & 0 & 483 & 8 & 36 & 0 & 44 & 719 \\
\hline 07:30 AM & 25 & 163 & 11 & 199 & 383 & 101 & 0 & 484 & 11 & 30 & 0 & 41 & 724 \\
\hline 07:45 AM & 31 & 163 & 10 & 204 & 359 & 65 & 0 & 424 & 8 & 50 & 0 & 58 & 686 \\
\hline 08:00 AM & 43 & 196 & 6 & 245 & 358 & 75 & 0 & 433 & 10 & 32 & 0 & 42 & 720 \\
\hline Total Volume & 135 & 669 & 36 & 840 & 1513 & 311 & 0 & 1824 & 37 & 148 & 0 & 185 & 2849 \\
\hline \% App. Total & 16.1 & 79.6 & 4.3 & & 82.9 & 17.1 & 0 & & 20 & 80 & 0 & & \\
\hline PHF & . 785 & . 853 & . 818 & . 857 & . 916 & . 770 & . 000 & . 942 & . 841 & . 740 & . 000 & . 797 & . 984 \\
\hline Cars & 121 & 570 & 36 & 727 & 1406 & 303 & 0 & 1709 & 36 & 138 & 0 & 174 & 2610 \\
\hline \% Cars & 89.6 & 85.2 & 100 & 86.5 & 92.9 & 97.4 & 0 & 93.7 & 97.3 & 93.2 & 0 & 94.1 & 91.6 \\
\hline Heavy Vehicles & 14 & 99 & 0 & 113 & 107 & 8 & 0 & 115 & 1 & 10 & 0 & 11 & 239 \\
\hline \% Heavy Vehicles & 10.4 & 14.8 & 0 & 13.5 & 7.1 & 2.6 & 0 & 6.3 & 2.7 & 6.8 & 0 & 5.9 & 8.4 \\
\hline
\end{tabular}


N/S: Tremont Street
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File Name : 143866 CC
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multicolumn{10}{|c|}{Groups Printed- Cars - Heavy Vehicles} & \multirow[b]{3}{*}{Int. Total} \\
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & Thru & Left & U-Turn & Right & Left & U-Turn & \\
\hline 04:00 PM & 19 & 249 & 8 & 240 & 31 & 0 & 39 & 32 & 0 & 618 \\
\hline 04:15 PM & 12 & 250 & 7 & 238 & 14 & 0 & 36 & 47 & 0 & 604 \\
\hline 04:30 PM & 22 & 283 & 7 & 262 & 32 & 0 & 43 & 43 & 0 & 692 \\
\hline 04:45 PM & 29 & 256 & 7 & 230 & 23 & 0 & 49 & 44 & 0 & 638 \\
\hline Total & 82 & 1038 & 29 & 970 & 100 & 0 & 167 & 166 & 0 & 2552 \\
\hline 05:00 PM & 24 & 292 & 6 & 330 & 26 & 0 & 31 & 52 & 0 & 761 \\
\hline 05:15 PM & 21 & 264 & 3 & 307 & 28 & 0 & 31 & 48 & 0 & 702 \\
\hline 05:30 PM & 18 & 250 & 5 & 325 & 37 & 1 & 38 & 47 & 0 & 721 \\
\hline 05:45 PM & 16 & 265 & 2 & 303 & 31 & 1 & 29 & 34 & 0 & 681 \\
\hline Total & 79 & 1071 & 16 & 1265 & 122 & 2 & 129 & 181 & 0 & 2865 \\
\hline Grand Total & 161 & 2109 & 45 & 2235 & 222 & 2 & 296 & 347 & 0 & 5417 \\
\hline Apprch \% & 7 & 91.1 & 1.9 & 90.9 & 9 & 0.1 & 46 & 54 & 0 & \\
\hline Total \% & 3 & 38.9 & 0.8 & 41.3 & 4.1 & 0 & 5.5 & 6.4 & 0 & \\
\hline Cars & 150 & 2001 & 45 & 2092 & 218 & 2 & 291 & 315 & 0 & 5114 \\
\hline \% Cars & 93.2 & 94.9 & 100 & 93.6 & 98.2 & 100 & 98.3 & 90.8 & 0 & 94.4 \\
\hline Heavy Vehicles & 11 & 108 & 0 & 143 & 4 & 0 & 5 & 32 & 0 & 303 \\
\hline \% Heavy Vehicles & 6.8 & 5.1 & 0 & 6.4 & 1.8 & 0 & 1.7 & 9.2 & 0 & 5.6 \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street
From South} & \multicolumn{4}{|c|}{\[
\begin{aligned}
& \text { Prentiss Street } \\
& \text { From West }
\end{aligned}
\]} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{\multirow[t]{2}{*}{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}} \\
\hline & & & & & & & & & & & & & \\
\hline 05:00 PM & 24 & 292 & 6 & 322 & 330 & 26 & 0 & 356 & 31 & 52 & 0 & 83 & 761 \\
\hline 05:15 PM & 21 & 264 & 3 & 288 & 307 & 28 & 0 & 335 & 31 & 48 & 0 & 79 & 702 \\
\hline 05:30 PM & 18 & 250 & 5 & 273 & 325 & 37 & 1 & 363 & 38 & 47 & 0 & 85 & 721 \\
\hline 05:45 PM & 16 & 265 & 2 & 283 & 303 & 31 & 1 & 335 & 29 & 34 & 0 & 63 & 681 \\
\hline Total Volume & 79 & 1071 & 16 & 1166 & 1265 & 122 & 2 & 1389 & 129 & 181 & 0 & 310 & 2865 \\
\hline \% App. Total & 6.8 & 91.9 & 1.4 & & 91.1 & 8.8 & 0.1 & & 41.6 & 58.4 & 0 & & \\
\hline PHF & . 823 & . 917 & . 667 & . 905 & . 958 & . 824 & . 500 & . 957 & . 849 & . 870 & . 000 & . 912 & . 941 \\
\hline Cars & 74 & 1017 & 16 & 1107 & 1196 & 120 & 2 & 1318 & 127 & 165 & 0 & 292 & 2717 \\
\hline \% Cars & 93.7 & 95.0 & 100 & 94.9 & 94.5 & 98.4 & 100 & 94.9 & 98.4 & 91.2 & 0 & 94.2 & 94.8 \\
\hline Heavy Vehicles & 5 & 54 & 0 & 59 & 69 & 2 & 0 & 71 & 2 & 16 & 0 & 18 & 148 \\
\hline \% Heavy Vehicles & 6.3 & 5.0 & 0 & 5.1 & 5.5 & 1.6 & 0 & 5.1 & 1.6 & 8.8 & 0 & 5.8 & 5.2 \\
\hline
\end{tabular}

N/S: Tremont Street
W: Prentiss Street
City, State: Roxbury, MA
Client: HSH/ A. Fabiszewski

PRECISION
D A T A
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File Name : 143866 CC
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & Thru & Left & U-Turn & Right & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 18 & 234 & 8 & 223 & 31 & 0 & 38 & 30 & 0 & 582 \\
\hline 04:15 PM & 11 & 234 & 7 & 221 & 14 & 0 & 35 & 42 & 0 & 564 \\
\hline 04:30 PM & 19 & 274 & 7 & 241 & 30 & 0 & 42 & 38 & 0 & 651 \\
\hline 04:45 PM & 28 & 242 & 7 & 211 & 23 & 0 & 49 & 40 & 0 & 600 \\
\hline Total & 76 & 984 & 29 & 896 & 98 & 0 & 164 & 150 & 0 & 2397 \\
\hline 05:00 PM & 24 & 280 & 6 & 312 & 24 & 0 & 31 & 48 & 0 & 725 \\
\hline 05:15 PM & 20 & 249 & 3 & 286 & 28 & 0 & 30 & 45 & 0 & 661 \\
\hline 05:30 PM & 16 & 235 & 5 & 307 & 37 & 1 & 37 & 42 & 0 & 680 \\
\hline 05:45 PM & 14 & 253 & 2 & 291 & 31 & 1 & 29 & 30 & 0 & 651 \\
\hline Total & 74 & 1017 & 16 & 1196 & 120 & 2 & 127 & 165 & 0 & 2717 \\
\hline Grand Total & 150 & 2001 & 45 & 2092 & 218 & 2 & 291 & 315 & 0 & 5114 \\
\hline Apprch \% & 6.8 & 91.1 & 2 & 90.5 & 9.4 & 0.1 & 48 & 52 & 0 & \\
\hline Total \% & 2.9 & 39.1 & 0.9 & 40.9 & 4.3 & 0 & 5.7 & 6.2 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 ,} \\
\hline \multicolumn{14}{|l|}{Peak Hour for Entire Intersection Begins at 05:00 PM} \\
\hline 05:00 PM & 24 & 280 & 6 & 310 & 312 & 24 & 0 & 336 & 31 & 48 & 0 & 79 & 725 \\
\hline 05:15 PM & 20 & 249 & 3 & 272 & 286 & 28 & 0 & 314 & 30 & 45 & 0 & 75 & 661 \\
\hline 05:30 PM & 16 & 235 & 5 & 256 & 307 & 37 & 1 & 345 & 37 & 42 & 0 & 79 & 680 \\
\hline 05:45 PM & 14 & 253 & 2 & 269 & 291 & 31 & 1 & 323 & 29 & 30 & 0 & 59 & 651 \\
\hline Total Volume & 74 & 1017 & 16 & 1107 & 1196 & 120 & 2 & 1318 & 127 & 165 & 0 & 292 & 2717 \\
\hline \% App. Total & 6.7 & 91.9 & 1.4 & & 90.7 & 9.1 & 0.2 & & 43.5 & 56.5 & 0 & & \\
\hline PHF & . 771 & . 908 & . 667 & . 893 & . 958 & . 811 & . 500 & . 955 & . 858 & . 859 & . 000 & . 924 & 937 \\
\hline
\end{tabular}

N/S: Tremont Street
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File Name : 143866 CC
Site Code : TBA
Start Date : 5/8/2014
Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & Thru & Left & U-Turn & Right & Left & U-Turn & Int. Total \\
\hline 04:00 PM & 1 & 15 & 0 & 17 & 0 & 0 & 1 & 2 & 0 & 36 \\
\hline 04:15 PM & 1 & 16 & 0 & 17 & 0 & 0 & 1 & 5 & 0 & 40 \\
\hline 04:30 PM & 3 & 9 & 0 & 21 & 2 & 0 & 1 & 5 & 0 & 41 \\
\hline 04:45 PM & 1 & 14 & 0 & 19 & 0 & 0 & 0 & 4 & 0 & 38 \\
\hline Total & 6 & 54 & 0 & 74 & 2 & 0 & 3 & 16 & 0 & 155 \\
\hline 05:00 PM & 0 & 12 & 0 & 18 & 2 & 0 & 0 & 4 & 0 & 36 \\
\hline 05:15 PM & 1 & 15 & 0 & 21 & 0 & 0 & 1 & 3 & 0 & 41 \\
\hline 05:30 PM & 2 & 15 & 0 & 18 & 0 & 0 & 1 & 5 & 0 & 41 \\
\hline 05:45 PM & 2 & 12 & 0 & 12 & 0 & 0 & 0 & 4 & 0 & 30 \\
\hline Total & 5 & 54 & 0 & 69 & 2 & 0 & 2 & 16 & 0 & 148 \\
\hline Grand Total & 11 & 108 & 0 & 143 & 4 & 0 & 5 & 32 & 0 & 303 \\
\hline Apprch \% & 9.2 & 90.8 & 0 & 97.3 & 2.7 & 0 & 13.5 & 86.5 & 0 & \\
\hline Total \% & 3.6 & 35.6 & 0 & 47.2 & 1.3 & 0 & 1.7 & 10.6 & 0 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline
\end{tabular}
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
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline 04:30 PM & 3 & 9 & 0 & 12 & 21 & 2 & 0 & 23 & 1 & 5 & 0 & 6 & 41 \\
\hline 04:45 PM & 1 & 14 & 0 & 15 & 19 & 0 & 0 & 19 & 0 & 4 & 0 & 4 & 38 \\
\hline 05:00 PM & 0 & 12 & 0 & 12 & 18 & 2 & 0 & 20 & 0 & 4 & 0 & 4 & 36 \\
\hline 05:15 PM & 1 & 15 & 0 & 16 & 21 & 0 & 0 & 21 & 1 & 3 & 0 & 4 & 41 \\
\hline Total Volume & 5 & 50 & 0 & 55 & 79 & 4 & 0 & 83 & 2 & 16 & 0 & 18 & 156 \\
\hline \% App. Total & 9.1 & 90.9 & 0 & & 95.2 & 4.8 & 0 & & 11.1 & 88.9 & 0 & & \\
\hline PHF & . 417 & . 833 & . 000 & . 859 & . 940 & . 500 & . 000 & . 902 & . 500 & . 800 & . 000 & . 750 & . 951 \\
\hline
\end{tabular}

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Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{3}{|c|}{Tremont Street From North} & \multicolumn{3}{|c|}{Tremont Street From South} & \multicolumn{3}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & Peds & Thru & Left & Peds & Right & Left & Peds & Int. Total \\
\hline 04:00 PM & 0 & 0 & 12 & 0 & 0 & 4 & 0 & 0 & 10 & 26 \\
\hline 04:15 PM & 0 & 0 & 8 & 0 & 0 & 10 & 0 & 0 & 5 & 23 \\
\hline 04:30 PM & 0 & 2 & 4 & 0 & 0 & 2 & 0 & 0 & 1 & 9 \\
\hline 04:45 PM & 1 & 0 & 5 & 0 & 0 & 3 & 0 & 0 & 3 & 12 \\
\hline Total & 1 & 2 & 29 & 0 & 0 & 19 & 0 & 0 & 19 & 70 \\
\hline 05:00 PM & 0 & 0 & 7 & 1 & 0 & 9 & 0 & 0 & 2 & 19 \\
\hline 05:15 PM & 0 & 0 & 12 & 1 & 0 & 10 & 0 & 0 & 0 & 23 \\
\hline 05:30 PM & 6 & 0 & 13 & 1 & 0 & 2 & 0 & 0 & 1 & 23 \\
\hline 05:45 PM & 0 & 0 & 6 & 2 & 0 & 6 & 0 & 0 & 1 & 15 \\
\hline Total & 6 & 0 & 38 & 5 & 0 & 27 & 0 & 0 & 4 & 80 \\
\hline Grand Total & 7 & 2 & 67 & 5 & 0 & 46 & 0 & 0 & 23 & 150 \\
\hline Apprch \% & 9.2 & 2.6 & 88.2 & 9.8 & 0 & 90.2 & 0 & 0 & 100 & \\
\hline Total \% & 4.7 & 1.3 & 44.7 & 3.3 & 0 & 30.7 & 0 & 0 & 15.3 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street From South} & \multicolumn{4}{|c|}{Prentiss Street From West} & \\
\hline Start Time & Right & Thru & Peds & App. Total & Thru & Left & Peds & App. Total & Right & Left & Peds & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1} \\
\hline \multicolumn{14}{|l|}{Peak Hour for Entire Intersection Begins at 05:00 PM} \\
\hline 05:00 PM & 0 & 0 & 7 & 7 & 1 & 0 & 9 & 10 & 0 & 0 & 2 & 2 & 19 \\
\hline 05:15 PM & 0 & 0 & 12 & 12 & 1 & 0 & 10 & 11 & 0 & 0 & 0 & 0 & 23 \\
\hline 05:30 PM & 6 & 0 & 13 & 19 & 1 & 0 & 2 & 3 & 0 & 0 & 1 & 1 & 23 \\
\hline 05:45 PM & 0 & 0 & 6 & 6 & 2 & 0 & 6 & 8 & 0 & 0 & 1 & 1 & 15 \\
\hline Total Volume & 6 & 0 & 38 & 44 & 5 & 0 & 27 & 32 & 0 & 0 & 4 & 4 & 80 \\
\hline \% App. Total & 13.6 & 0 & 86.4 & & 15.6 & 0 & 84.4 & & 0 & 0 & 100 & & \\
\hline PHF & . 250 & . 000 & . 731 & . 579 & . 625 & . 000 & . 675 & . 727 & . 000 & . 000 & . 500 & . 500 & . 870 \\
\hline
\end{tabular}

N/S: Tremont Street
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Client: HSH/ A. Fabiszewski

PRECISION
D A T A INDUSTRIES, LLC
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Email:datarequests@pdillc.com

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Page No : 1
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \multicolumn{4}{|c|}{Tremont Street From North} & \multicolumn{4}{|c|}{Tremont Street
From South} & \multicolumn{4}{|c|}{Prentiss Street
From West} & \\
\hline Start Time & Right & Thru & U-Turn & App. Total & Thru & Left & U-Turn & App. Total & Right & Left & U-Turn & App. Total & Int. Total \\
\hline \multicolumn{14}{|l|}{Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1} \\
\hline \multicolumn{14}{|l|}{Peak Hour for Entire Intersection Begins at 05:00 PM} \\
\hline 05:00 PM & 24 & 292 & 6 & 322 & 330 & 26 & 0 & 356 & 31 & 52 & 0 & 83 & 761 \\
\hline 05:15 PM & 21 & 264 & 3 & 288 & 307 & 28 & 0 & 335 & 31 & 48 & 0 & 79 & 702 \\
\hline 05:30 PM & 18 & 250 & 5 & 273 & 325 & 37 & 1 & 363 & 38 & 47 & 0 & 85 & 721 \\
\hline 05:45 PM & 16 & 265 & 2 & 283 & 303 & 31 & 1 & 335 & 29 & 34 & 0 & 63 & 681 \\
\hline Total Volume & 79 & 1071 & 16 & 1166 & 1265 & 122 & 2 & 1389 & 129 & 181 & 0 & 310 & 2865 \\
\hline \% App. Total & 6.8 & 91.9 & 1.4 & & 91.1 & 8.8 & 0.1 & & 41.6 & 58.4 & 0 & & \\
\hline PHF & . 823 & . 917 & . 667 & . 905 & . 958 & . 824 & . 500 & . 957 & . 849 & . 870 & . 000 & . 912 & . 941 \\
\hline Cars & 74 & 1017 & 16 & 1107 & 1196 & 120 & 2 & 1318 & 127 & 165 & 0 & 292 & 2717 \\
\hline \% Cars & 93.7 & 95.0 & 100 & 94.9 & 94.5 & 98.4 & 100 & 94.9 & 98.4 & 91.2 & 0 & 94.2 & 94.8 \\
\hline Heavy Vehicles & 5 & 54 & 0 & 59 & 69 & 2 & 0 & 71 & 2 & 16 & 0 & 18 & 148 \\
\hline \% Heavy Vehicles & 6.3 & 5.0 & 0 & 5.1 & 5.5 & 1.6 & 0 & 5.1 & 1.6 & 8.8 & 0 & 5.8 & 5.2 \\
\hline
\end{tabular}


\section*{INTERSECTION CAPACITY ANALYSIS WORKSHEETS}


\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & & & 4 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & ¢ \({ }^{\text {a }}\) & & & \(\uparrow \uparrow\) & 「 & & \％ & 惺家 & & & \({ }^{7}\) \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width（ft） & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length（ft） & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector（ft） & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector（ft） & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed（mph） & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util．Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.976 & & & & 0.850 & & & 0.992 & & & \\
\hline Flt Protected & & 0.980 & & & 0.994 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（prot） & 0 & 2687 & 0 & 0 & 2893 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1117 \\
\hline Flt Permitted & & 0.567 & & & 0.703 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（perm） & 0 & 1555 & 0 & 0 & 2046 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1117 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd．Flow（RTOR） & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed（mph） & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance（ft） & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time（s） & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume（vph） & 211 & 253 & 77 & 56 & 394 & 440 & 3 & 147 & 1165 & 54 & 8 & 114 \\
\hline Peak Hour Factor & 0.85 & 0.93 & 0.76 & 0.86 & 0.89 & 0.87 & 0.38 & 0.87 & 0.85 & 0.70 & 0.67 & 0.86 \\
\hline Heavy Vehicles（\％） & 4\％ & 8\％ & 5\％ & 16\％ & 11\％ & 13\％ & 0\％ & 4\％ & 5\％ & 8\％ & 0\％ & 39\％ \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking（\＃／hr） & & 1 & 1 & & & & & & & & & \\
\hline Adj．Flow（vph） & 248 & 272 & 101 & 65 & 443 & 506 & 8 & 169 & 1371 & 77 & 12 & 133 \\
\hline Lane Group Flow（vph） & 0 & 621 & 0 & 0 & 508 & 506 & 0 & 177 & 1448 & 0 & 0 & 145 \\
\hline Turn Type & D．P＋P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial（s） & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split（s） & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split（s） & 15.0 & 43.0 & 0.0 & 28.0 & 28.0 & 0.0 & 19.0 & 19.0 & 40.0 & 0.0 & 19.0 & 19.0 \\
\hline Total Split（\％） & 10．7\％ & 30．7\％ & 0．0\％ & 20．0\％ & 20．0\％ & 0．0\％ & 13．6\％ & 13．6\％ & 28．6\％ & 0．0\％ & 13．6\％ & 13．6\％ \\
\hline Maximum Green（s） & 9.0 & & & 21.0 & 21.0 & & 13.0 & 13.0 & 34.0 & & 13.0 & 13.0 \\
\hline Yellow Time（s） & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All－Red Time（s） & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead／Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead－Lag Optimize？ & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension（s） & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C－Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time（s）} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk（s）} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls（\＃／hr）} \\
\hline Act Effct Green（s） & & 35.0 & & & 24.0 & 140.0 & & 15.0 & 36.0 & & & 15.0 \\
\hline Actuated g／C Ratio & & 0.25 & & & 0.17 & 1.00 & & 0.11 & 0.26 & & & 0.11 \\
\hline v／c Ratio & & 1．69dl & & & 1.45 & 0.39 & & 1.13 & 1.32 & & & 1.21 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & 4 & P & 4 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Control Delay & & 188.7 & & & 257.2 & 0.9 & & 167.0 & 192.3 & & & 199.5 \\
\hline Queue Delay & & 0.0 & & & 0.0 & 0.0 & & 0.0 & 0.0 & & & 0.0 \\
\hline Total Delay & & 188.7 & & & 257.2 & 0.9 & & 167.0 & 192.3 & & & 199.5 \\
\hline LOS & & F & & & F & A & & F & F & & & F \\
\hline Approach Delay & & 188.7 & & & 129.3 & & & & 189.6 & & & \\
\hline Approach LOS & & F & & & F & & & & F & & & \\
\hline Queue Length 50th (ft) & & ~371 & & & ~331 & 0 & & ~187 & ~623 & & & ~161 \\
\hline Queue Length 95th (ft) & & \#504 & & & \#441 & 0 & & \#327 & \#659 & & & \#286 \\
\hline Internal Link Dist (ft) & & 371 & & & 313 & & & & 369 & & & \\
\hline Turn Bay Length (ft) & & & & & & 200 & & 200 & & & & 200 \\
\hline Base Capacity (vph) & & 478 & & & 351 & 1286 & & 156 & 1095 & & & 120 \\
\hline Starvation Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Spillback Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Storage Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Reduced v/c Ratio & & 1.30 & & & 1.45 & 0.39 & & 1.13 & 1.32 & & & 1.21 \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline \multicolumn{13}{|l|}{Area Type: CBD} \\
\hline \multicolumn{13}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Offset: 9 (6\%), Referenced to phase 1:NBSB, Start of Green} \\
\hline \multicolumn{13}{|l|}{Natural Cycle: 145} \\
\hline \multicolumn{13}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{13}{|l|}{Maximum v/c Ratio: 1.45} \\
\hline \multicolumn{5}{|l|}{Intersection Signal Delay: 150.6} & \multicolumn{8}{|l|}{Intersection LOS: F} \\
\hline \multicolumn{13}{|l|}{Intersection Capacity Utilization 78.4\% ICU Level of Service D} \\
\hline \multicolumn{13}{|l|}{Analysis Period (min) 15} \\
\hline \multicolumn{13}{|l|}{~ Volume exceeds capacity, queue is theoretically infinite.} \\
\hline \multicolumn{13}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{13}{|l|}{\# 95th percentile volume exceeds capacity, queue may be longer.} \\
\hline \multicolumn{13}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{13}{|l|}{dl Defacto Left Lane. Recode with 1 though lane as a left lane.} \\
\hline
\end{tabular}

Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard

\begin{tabular}{lrr} 
& & \\
& SBT & SBR \(\quad ø 2\) \\
Lane Group & 50.4 & \\
Control Delay & 0.0 & \\
Queue Delay & 50.4 & \\
Total Delay & D & \\
LOS & 75.3 & \\
Approach Delay & E & \\
Approach LOS & 217 & \\
Queue Length 50th (ft) & \\
Queue Length 95th (ft) & 266 \\
Internal Link Dist (ft) & 731 \\
Turn Bay Length (ft) & 1074 \\
Base Capacity (vph) & \\
Starvation Cap Reductn & 0 & \\
Spillback Cap Reductn & 0 & \\
Storage Cap Reductn & 0 & \\
Reduced v/c Ratio & 0.67 & \\
Intersection Summary & &
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & 7 & & & 4 & \(\uparrow\) & & & \(\dagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \({ }_{4}{ }^{\text {a }}\) & & & ¢ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.98 & & & 0.99 & & & 0.97 & & & & \\
\hline Frt & & 0.984 & & & 0.986 & & & 0.982 & & & & \\
\hline Flt Protected & & 0.999 & & & 0.997 & & & 0.985 & & & & \\
\hline Satd. Flow (prot) & 0 & 1359 & 0 & 0 & 2710 & 0 & 0 & 1607 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.977 & & & 0.877 & & & 0.985 & & & & \\
\hline Satd. Flow (perm) & 0 & 1328 & 0 & 0 & 2375 & 0 & 0 & 1582 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 18 & & & 29 & & & 9 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 333 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 7.6 & \\
\hline Volume (vph) & 6 & 498 & 61 & 30 & 642 & 60 & 128 & 228 & 43 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.38 & 0.84 & 0.76 & 0.58 & 0.90 & 0.75 & 0.92 & 0.92 & 0.73 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 6\% & 0\% & 3\% & 7\% & 7\% & 2\% & 0\% & 5\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 16 & 593 & 80 & 52 & 713 & 80 & 139 & 248 & 59 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 689 & 0 & 0 & 845 & 0 & 0 & 446 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 2 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 2 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 2 & 2 & & & & \\
\hline Minimum Initial (s) & 4.0 & 4.0 & & 4.0 & 4.0 & & 4.0 & 4.0 & & & & \\
\hline Minimum Split (s) & 21.0 & 21.0 & & 21.0 & 21.0 & & 21.0 & 21.0 & & & & \\
\hline Total Split (s) & 57.0 & 57.0 & 0.0 & 57.0 & 57.0 & 0.0 & 23.0 & 23.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 71.3\% & 71.3\% & 0.0\% & 71.3\% & 71.3\% & 0.0\% & 28.8\% & 28.8\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 52.0 & 52.0 & & 52.0 & 52.0 & & 18.0 & 18.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline Lead/Lag & Lead & Lead & & Lead & Lead & & Lag & Lag & & & & \\
\hline Lead-Lag Optimize? & Yes & Yes & & Yes & Yes & & Yes & Yes & & & & \\
\hline Vehicle Extension (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & None & None & & None & None & & None & None & & & & \\
\hline Act Effct Green (s) & & 46.2 & & & 46.2 & & & 25.8 & & & & \\
\hline Actuated g/C Ratio & & 0.58 & & & 0.58 & & & 0.32 & & & & \\
\hline \(\mathrm{v} / \mathrm{c}\) Ratio & & 0.89 & & & 0.61 & & & 0.86 & & & & \\
\hline Control Delay & & 28.4 & & & 12.0 & & & 48.3 & & & & \\
\hline Queue Delay & & 26.6 & & & 0.1 & & & 1.9 & & & & \\
\hline Total Delay & & 55.0 & & & 12.1 & & & 50.2 & & & & \\
\hline LOS & & D & & & B & & & D & & & & \\
\hline
\end{tabular}

3: Tremont Street \& Gurney Street
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 7 & \(\rightarrow\) & & 7 & \(\leftarrow\) & & 4 & \(\dagger\) & \(>\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Approach Delay & & 55.0 & & & 12.1 & & & 50.2 & & & & \\
\hline Approach LOS & & D & & & B & & & D & & & & \\
\hline Queue Length 50th (ft) & & 237 & & & 113 & & & 217 & & & & \\
\hline Queue Length 95th (ft) & & 307 & & & 138 & & & \#446 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 253 & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & & \\
\hline Base Capacity (vph) & & 886 & & & 1583 & & & 516 & & & & \\
\hline Starvation Cap Reductn & & 220 & & & 0 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 134 & & & 18 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.03 & & & 0.58 & & & 0.90 & & & & \\
\hline Intersection Summary & & & & & & & & & & & & \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0\%), Referenced to phase 6:, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 35.6 Intersection LOS: D
Intersection Capacity Utilization 71.8\% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{lrrrrrrrrrrrrrr}
\hline & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & \(\rightarrow\) & & \(\dagger\) & & 4 & 4 & \(\dagger\) & P & & \(\downarrow\) & \(\checkmark\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & D & & & B & & & & & & F & \\
\hline Approach Delay & & 45.9 & & & 17.2 & & & & & & 115.7 & \\
\hline Approach LOS & & D & & & B & & & & & & F & \\
\hline Queue Length 50th (ft) & & 362 & & & 165 & & & & & & 293 & \\
\hline Queue Length 95th (ft) & & \#648 & & & 207 & & & & & & \#474 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & & \\
\hline Base Capacity (vph) & & 714 & & & 1804 & & & & & & 362 & \\
\hline Starvation Cap Reductn & & 0 & & & 922 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 129 & & & 0 & & & & & & 44 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.01 & & & 0.94 & & & & & & 1.03 & \\
\hline Intersection Summary & & & & & & & & & & & & \\
\hline
\end{tabular}
```

Area Type:
CBD

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Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(90(64 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 45.5 Intersection LOS: D
Intersection Capacity Utilization 84.1\% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th (ft) \\
Queue Length 95th (ft) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & \(t\) & & 4 & 7 & & \(\dagger\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * \({ }^{\text {c }}\) & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 6 & 106 & 368 & 0 & 0 & 257 & \\
\hline Peak Hour Factor & 0.50 & 0.85 & 0.92 & 0.25 & 0.92 & 0.97 & \\
\hline Hourly flow rate (vph) & 12 & 125 & 400 & 0 & 0 & 265 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed (ft/s) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 665 & 400 & & & 400 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu, unblocked vol & 665 & 400 & & & 400 & & \\
\hline tC, single (s) & 6.4 & 6.3 & & & 4.1 & & \\
\hline tC, 2 stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.4 & & & 2.2 & & \\
\hline p0 queue free \% & 97 & 80 & & & 100 & & \\
\hline cM capacity (veh/h) & 428 & 637 & & & 1170 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 137 & 400 & 265 & & & & \\
\hline Volume Left & 12 & 0 & 0 & & & & \\
\hline Volume Right & 125 & 0 & 0 & & & & \\
\hline cSH & 611 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.22 & 0.24 & 0.16 & & & & \\
\hline Queue Length 95th (ft) & 21 & 0 & 0 & & & & \\
\hline Control Delay (s) & 12.6 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 12.6 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 2.1 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 35.8\% & \multicolumn{3}{|r|}{\multirow[t]{2}{*}{ICU Level of Service}} & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}


\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger 1\) & 4 & 4 & 7 & & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & ¢ \({ }^{\text {a }}\) & & & \(\uparrow \uparrow\) & 「 & & \({ }^{7}\) & 惺 & & & 7 \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length (ft) & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util. Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.962 & & & & 0.850 & & & 0.986 & & & \\
\hline Flt Protected & & 0.988 & & & 0.991 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (prot) & 0 & 2733 & 0 & 0 & 3126 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1234 \\
\hline Flt Permitted & & 0.571 & & & 0.597 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (perm) & 0 & 1579 & 0 & 0 & 1883 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1234 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd. Flow (RTOR) & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance (ft) & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time (s) & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume (vph) & 141 & 314 & 145 & 61 & 287 & 320 & 1 & 128 & 930 & 96 & 3 & 143 \\
\hline Peak Hour Factor & 0.83 & 0.92 & 0.83 & 0.83 & 0.89 & 0.82 & 0.25 & 0.89 & 0.86 & 0.85 & 0.38 & 0.89 \\
\hline Heavy Vehicles (\%) & 1\% & 5\% & 3\% & 3\% & 3\% & 15\% & 0\% & 3\% & 4\% & 3\% & 0\% & 24\% \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking (\#/hr) & & 1 & 1 & & & & & & & & & \\
\hline Adj. Flow (vph) & 170 & 341 & 175 & 73 & 322 & 390 & 4 & 144 & 1081 & 113 & 8 & 161 \\
\hline Lane Group Flow (vph) & 0 & 686 & 0 & 0 & 395 & 390 & 0 & 148 & 1194 & 0 & 0 & 169 \\
\hline Turn Type & D.P+P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial (s) & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split (s) & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split (s) & 15.0 & 40.0 & 0.0 & 25.0 & 25.0 & 0.0 & 20.0 & 20.0 & 42.0 & 0.0 & 20.0 & 20.0 \\
\hline Total Split (\%) & 10.7\% & 28.6\% & 0.0\% & 17.9\% & 17.9\% & 0.0\% & 14.3\% & 14.3\% & 30.0\% & 0.0\% & 14.3\% & 14.3\% \\
\hline Maximum Green (s) & 9.0 & & & 18.0 & 18.0 & & 14.0 & 14.0 & 36.0 & & 14.0 & 14.0 \\
\hline Yellow Time (s) & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All-Red Time (s) & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead/Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead-Lag Optimize? & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension (s) & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C-Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 32.0 & & & 21.0 & 140.0 & & 16.0 & 38.0 & & & 16.0 \\
\hline Actuated g/C Ratio & & 0.23 & & & 0.15 & 1.00 & & 0.11 & 0.27 & & & 0.11 \\
\hline v/c Ratio & & 1.52 & & & 1.40 & 0.31 & & 0.88 & 1.03 & & & 1.20 \\
\hline
\end{tabular}



\section*{Queue shown is maximum after two cycles.}

Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard


\begin{tabular}{lrr} 
Lane Group & SBT & SBR \(\quad ø 2\) \\
\hline Control Delay & 63.4 & \\
Queue Delay & 0.0 & \\
Total Delay & 63.4 & \\
LOS & E & \\
Approach Delay & 79.9 & E \\
Approach LOS & 367 & \\
Queue Length 50th (ft) & \\
Queue Length 95th (ft) & \(\# 456\) \\
Internal Link Dist (ft) & 731 & \\
Turn Bay Length (ft) & & \\
Base Capacity (vph) & 1210 \\
Starvation Cap Reductn & 0 \\
Spillback Cap Reductn & 0 \\
Storage Cap Reductn & 0 & \\
Reduced v/c Ratio & 0.93 \\
Intersection Summary & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 4 & \(\dagger\) & & - & \(\dagger\) & \(\checkmark\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & &  & & & ¢ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.97 & & & 0.98 & & & 0.97 & & & & \\
\hline Frt & & 0.980 & & & 0.983 & & & 0.981 & & & & \\
\hline Flt Protected & & 0.999 & & & 0.996 & & & 0.984 & & & & \\
\hline Satd. Flow (prot) & 0 & 1380 & 0 & 0 & 2781 & 0 & 0 & 1591 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.978 & & & 0.846 & & & 0.984 & & & & \\
\hline Satd. Flow (perm) & 0 & 1350 & 0 & 0 & 2349 & 0 & 0 & 1565 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 23 & & & 37 & & & 10 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 333 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 7.6 & \\
\hline Volume (vph) & 8 & 559 & 84 & 38 & 448 & 59 & 99 & 156 & 41 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.40 & 0.94 & 0.80 & 0.68 & 0.88 & 0.82 & 0.91 & 0.87 & 0.85 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 3\% & 0\% & 3\% & 4\% & 0\% & 2\% & 2\% & 2\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 20 & 595 & 105 & 56 & 509 & 72 & 109 & 179 & 48 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 720 & 0 & 0 & 637 & 0 & 0 & 336 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 2 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 2 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 2 & 2 & & & & \\
\hline Minimum Initial (s) & 4.0 & 4.0 & & 4.0 & 4.0 & & 4.0 & 4.0 & & & & \\
\hline Minimum Split (s) & 21.0 & 21.0 & & 21.0 & 21.0 & & 21.0 & 21.0 & & & & \\
\hline Total Split (s) & 57.0 & 57.0 & 0.0 & 57.0 & 57.0 & 0.0 & 23.0 & 23.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 71.3\% & 71.3\% & 0.0\% & 71.3\% & 71.3\% & 0.0\% & 28.8\% & 28.8\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 52.0 & 52.0 & & 52.0 & 52.0 & & 18.0 & 18.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline Lead/Lag & Lead & Lead & & Lead & Lead & & Lag & Lag & & & & \\
\hline Lead-Lag Optimize? & Yes & Yes & & Yes & Yes & & Yes & Yes & & & & \\
\hline Vehicle Extension (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & None & None & & None & None & & None & None & & & & \\
\hline Act Effct Green (s) & & 46.6 & & & 46.6 & & & 25.4 & & & & \\
\hline Actuated g/C Ratio & & 0.58 & & & 0.58 & & & 0.32 & & & & \\
\hline v/c Ratio & & 0.90 & & & 0.46 & & & 0.67 & & & & \\
\hline Control Delay & & 29.9 & & & 9.4 & & & 34.6 & & & & \\
\hline Queue Delay & & 35.0 & & & 0.0 & & & 0.2 & & & & \\
\hline Total Delay & & 64.9 & & & 9.4 & & & 34.7 & & & & \\
\hline LOS & & E & & & A & & & C & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 7 & \(\rightarrow\) & & 7 & \(\leftarrow\) & & 4 & \(\dagger\) & \(>\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Approach Delay & & 64.9 & & & 9.4 & & & 34.7 & & & & \\
\hline Approach LOS & & E & & & A & & & C & & & & \\
\hline Queue Length 50th (ft) & & 244 & & & 70 & & & 150 & & & & \\
\hline Queue Length 95th (ft) & & \#421 & & & 88 & & & \#292 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 253 & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & & \\
\hline Base Capacity (vph) & & 902 & & & 1569 & & & 504 & & & & \\
\hline Starvation Cap Reductn & & 223 & & & 0 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 63 & & & 9 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.06 & & & 0.42 & & & 0.68 & & & & \\
\hline Intersection Summary & & & & & & & & & & & & \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0\%), Referenced to phase 6:, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 38.0
Intersection LOS: D
Intersection Capacity Utilization 72.1\% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & \% & \(\%\) &  & 4 & 4 & \(\dagger\) & \(p\) & \[
\vartheta
\] & \(\dagger\) & 4 \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & \(\uparrow\) & & & * \(\uparrow\) & & & & & & \(\dagger\) & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 9 & 9 & 9 & 14 & 14 & 14 & 12 & 12 & 12 & 10 & 10 & 10 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & & & & 50 & 50 & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & & & & 0 & 0 & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Frt & & 0.979 & & & 0.971 & & & & & & 0.991 & \\
\hline Flt Protected & & 0.997 & & & 0.995 & & & & & & 0.981 & \\
\hline Satd. Flow (prot) & 0 & 1458 & 0 & 0 & 3248 & 0 & 0 & 0 & 0 & 0 & 1539 & 0 \\
\hline Flt Permitted & & 0.926 & & & 0.749 & & & & & & 0.981 & \\
\hline Satd. Flow (perm) & 0 & 1355 & 0 & 0 & 2445 & 0 & 0 & 0 & 0 & 0 & 1539 & 0 \\
\hline Right Turn on Red & & & No & & & No & & & No & & & No \\
\hline \multicolumn{13}{|l|}{Satd. Flow (RTOR)} \\
\hline Headway Factor & 1.30 & 1.30 & 1.30 & 1.05 & 1.05 & 1.05 & 1.14 & 1.14 & 1.14 & 1.25 & 1.25 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 555 & & & 270 & & & 349 & & & 585 & \\
\hline Travel Time (s) & & 12.6 & & & 6.1 & & & 7.9 & & & 13.3 & \\
\hline Volume (vph) & 25 & 479 & 73 & 55 & 384 & 108 & 0 & 0 & 0 & 172 & 234 & 24 \\
\hline Peak Hour Factor & 0.63 & 0.93 & 0.73 & 0.81 & 0.81 & 0.84 & 0.92 & 0.92 & 0.92 & 0.88 & 0.86 & 0.75 \\
\hline Heavy Vehicles (\%) & 8\% & 3\% & 1\% & 0\% & 3\% & 5\% & 2\% & 2\% & 2\% & 0\% & 1\% & 4\% \\
\hline Parking (\#/hr) & & & 0 & & & 0 & & & & & & 0 \\
\hline Adj. Flow (vph) & 40 & 515 & 100 & 68 & 474 & 129 & 0 & 0 & 0 & 195 & 272 & 32 \\
\hline Lane Group Flow (vph) & 0 & 655 & 0 & 0 & 671 & 0 & 0 & 0 & 0 & 0 & 499 & 0 \\
\hline Turn Type & Perm & & & Perm & & & & & & Split & & \\
\hline Protected Phases & & 1 & & & 1 & & & & & 9 & 9 & \\
\hline Permitted Phases & 1 & & & 1 & & & & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & & & & 9 & 9 & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & & & & 8.0 & 8.0 & \\
\hline Minimum Split (s) & 12.0 & 12.0 & & 12.0 & 12.0 & & & & & 12.0 & 12.0 & \\
\hline Total Split (s) & 71.0 & 71.0 & 0.0 & 71.0 & 71.0 & 0.0 & 0.0 & 0.0 & 0.0 & 45.0 & 45.0 & 0.0 \\
\hline Total Split (\%) & 50.7\% & 50.7\% & 0.0\% & 50.7\% & 50.7\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% & 32.1\% & 32.1\% & 0.0\% \\
\hline Maximum Green (s) & 67.0 & 67.0 & & 67.0 & 67.0 & & & & & 41.0 & 41.0 & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & & & & 3.0 & 3.0 & \\
\hline All-Red Time (s) & 1.0 & 1.0 & & 1.0 & 1.0 & & & & & 1.0 & 1.0 & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & & & & 2.0 & 2.0 & \\
\hline Recall Mode & C-Max & C-Max & & C-Max & C-Max & & & & & None & None & \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 91.0 & & & 91.0 & & & & & & 41.0 & \\
\hline Actuated g/C Ratio & & 0.65 & & & 0.65 & & & & & & 0.29 & \\
\hline v/c Ratio & & 0.74 & & & 0.42 & & & & & & 1.11 & \\
\hline Control Delay & & 23.2 & & & 12.8 & & & & & & 120.0 & \\
\hline Queue Delay & & 5.2 & & & 7.2 & & & & & & 25.7 & \\
\hline Total Delay & & 28.4 & & & 20.0 & & & & & & 145.7 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{ }{*}\) & \(\rightarrow\) & & 7 & - & 4 & 4 & \(\dagger\) & 1 & \(\checkmark\) & \(\frac{1}{7}\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & C & & & C & & & & & & F & \\
\hline Approach Delay & & 28.4 & & & 20.0 & & & & & & 145.7 & \\
\hline Approach LOS & & C & & & C & & & & & & F & \\
\hline Queue Length 50th (ft) & & 379 & & & 145 & & & & & & \(\sim 517\) & \\
\hline Queue Length 95th (ft) & & 551 & & & 160 & & & & & & \#687 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 881 & & & 1589 & & & & & & 451 & \\
\hline Starvation Cap Reductn & & 0 & & & 863 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 166 & & & 0 & & & & & & 24 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 0.92 & & & 0.92 & & & & & & 1.17 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(43(31 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 57.4 Intersection LOS: E
Intersection Capacity Utilization 87.7\% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th (ft) \\
Queue Length 95th (ft) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & \(\dagger\) & & & \(p\) & & \(\downarrow\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * \({ }^{\text {c }}\) & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 10 & 101 & 178 & 0 & 0 & 332 & \\
\hline Peak Hour Factor & 0.63 & 0.79 & 0.87 & 0.25 & 0.92 & 0.81 & \\
\hline Hourly flow rate (vph) & 16 & 128 & 205 & 0 & 0 & 410 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed (ft/s) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 614 & 205 & & & 205 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu , unblocked vol & 614 & 205 & & & 205 & & \\
\hline tC, single (s) & 6.4 & 6.2 & & & 4.1 & & \\
\hline \(\mathrm{tC}, 2\) stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.3 & & & 2.2 & & \\
\hline p0 queue free \% & 97 & 85 & & & 100 & & \\
\hline cM capacity (veh/h) & 458 & 839 & & & 1379 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 144 & 205 & 410 & & & & \\
\hline Volume Left & 16 & 0 & 0 & & & & \\
\hline Volume Right & 128 & 0 & 0 & & & & \\
\hline cSH & 768 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.19 & 0.12 & 0.24 & & & & \\
\hline Queue Length 95th (ft) & 17 & 0 & 0 & & & & \\
\hline Control Delay (s) & 10.8 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 10.8 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 2.0 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 33.6\% & & ICU Level & of Service & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & & \(\downarrow\) & \(\downarrow\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\varnothing 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & ＊ & & \({ }^{7}\) & 坐种 & 中 \({ }^{\text {a }}\) & & & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width（ft） & 13 & 12 & 10 & 11 & 11 & 12 & & & & & \\
\hline Storage Length（ft） & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector（ft） & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector（ft） & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed（mph） & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.974 & & & & 0.976 & & & & & & \\
\hline Flt Protected & 0.961 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（prot） & 1557 & 0 & 1472 & 4172 & 2550 & 0 & & & & & \\
\hline Flt Permitted & 0.961 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（perm） & 1557 & 0 & 1472 & 4172 & 2550 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd．Flow（RTOR） & 8 & & & & 20 & & & & & & \\
\hline Headway Factor & 1.10 & 1.14 & 1.25 & 1.21 & 1.27 & 1.14 & & & & & \\
\hline Link Speed（mph） & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance（ft） & 984 & & & 811 & 161 & & & & & & \\
\hline Travel Time（s） & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume（vph） & 152 & 42 & 319 & 1657 & 793 & 138 & & & & & \\
\hline Peak Hour Factor & 0.74 & 0.84 & 0.77 & 0.92 & 0.85 & 0.78 & & & & & \\
\hline Heavy Vehicles（\％） & 7\％ & 3\％ & 3\％ & 7\％ & 15\％ & 10\％ & & & & & \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 8 & 0 & 8 & & & & & \\
\hline Parking（\＃／hr） & & & & & 0 & 0 & & & & & \\
\hline Adj．Flow（vph） & 205 & 50 & 414 & 1801 & 933 & 177 & & & & & \\
\hline Lane Group Flow（vph） & 255 & 0 & 414 & 1801 & 1110 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline \multicolumn{12}{|l|}{Permitted Phases} \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial（s） & 8.0 & & 8.0 & 8.0 & & & 8.0 & 1.0 & 8.0 & 3.0 & 4.0 \\
\hline Minimum Split（s） & 13.0 & & 13.0 & 13.0 & & & 30.0 & 4.0 & 13.0 & 8.0 & 20.0 \\
\hline Total Split（s） & 29.0 & 0.0 & 37.0 & 64.0 & 69.0 & 0.0 & 52.0 & 5.0 & 25.0 & 17.0 & 46.0 \\
\hline Total Split（\％） & 20．7\％ & 0．0\％ & 26．4\％ & 45．7\％ & 49．3\％ & 0．0\％ & 37\％ & 4\％ & 18\％ & 12\％ & 33\％ \\
\hline Maximum Green（s） & 24.0 & & 32.0 & 59.0 & & & 47.0 & 3.0 & 20.0 & 12.0 & 42.0 \\
\hline Yellow Time（s） & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All－Red Time（s） & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead／Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead－Lag Optimize？ & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension（s） & 2.0 & & 2.0 & 2.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & Max & C－Max & & & C－Max & None & None & Max & None \\
\hline Walk Time（s） & & & & & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & & & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & & & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 24.1 & & 33.9 & 69.5 & 70.0 & & & & & & \\
\hline Actuated g／C Ratio & 0.17 & & 0.24 & 0.50 & 0.50 & & & & & & \\
\hline v／c Ratio & 0.93 & & 1.16 & 0.87 & 0.86 & & & & & & \\
\hline
\end{tabular}


Splits and Phases: 1: Prentiss Street \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 7 & 4 & & \％ & 4 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & 4 \({ }^{\text {a }}\) & & & \(\uparrow \uparrow\) & 「 & & \％ & 惺家 & & & \％ \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width（ft） & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length（ft） & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector（ft） & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector（ft） & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed（mph） & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util．Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.978 & & & & 0.850 & & & 0.992 & & & \\
\hline Flt Protected & & 0.978 & & & 0.994 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（prot） & 0 & 2691 & 0 & 0 & 2893 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Flt Permitted & & 0.578 & & & 0.641 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（perm） & 0 & 1591 & 0 & 0 & 1866 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd．Flow（RTOR） & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed（mph） & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance（ft） & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time（s） & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume（vph） & 265 & 259 & 79 & 57 & 404 & 464 & 3 & 151 & 1237 & 55 & 8 & 121 \\
\hline Peak Hour Factor & 0.85 & 0.93 & 0.76 & 0.86 & 0.89 & 0.87 & 0.38 & 0.87 & 0.85 & 0.70 & 0.67 & 0.86 \\
\hline Heavy Vehicles（\％） & 4\％ & 8\％ & 5\％ & 16\％ & 11\％ & 13\％ & 0\％ & 4\％ & 5\％ & 8\％ & 0\％ & 39\％ \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking（\＃／hr） & & 1 & 1 & & & & & & & & & \\
\hline Adj．Flow（vph） & 312 & 278 & 104 & 66 & 454 & 533 & 8 & 174 & 1455 & 79 & 12 & 141 \\
\hline Lane Group Flow（vph） & 0 & 694 & 0 & 0 & 520 & 533 & 0 & 182 & 1534 & 0 & 0 & 153 \\
\hline Turn Type & D．P＋P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial（s） & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split（s） & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split（s） & 15.0 & 43.0 & 0.0 & 28.0 & 28.0 & 0.0 & 19.0 & 19.0 & 40.0 & 0.0 & 19.0 & 19.0 \\
\hline Total Split（\％） & 10．7\％ & 30．7\％ & 0．0\％ & 20．0\％ & 20．0\％ & 0．0\％ & 13．6\％ & 13．6\％ & 28．6\％ & 0．0\％ & 13．6\％ & 13．6\％ \\
\hline Maximum Green（s） & 9.0 & & & 21.0 & 21.0 & & 13.0 & 13.0 & 34.0 & & 13.0 & 13.0 \\
\hline Yellow Time（s） & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All－Red Time（s） & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead／Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead－Lag Optimize？ & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension（s） & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C－Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time（s）} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk（s）} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls（\＃／hr）} \\
\hline Act Effct Green（s） & & 35.0 & & & 24.0 & 140.0 & & 15.0 & 36.0 & & & 15.0 \\
\hline Actuated g／C Ratio & & 0.25 & & & 0.17 & 1.00 & & 0.11 & 0.26 & & & 0.11 \\
\hline v／c Ratio & & 2．12dl & & & 1.62 & 0.41 & & 1.17 & 1.40 & & & 1.29 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & \(\dagger\) & \(p\) & & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Control Delay & & 233.0 & & & 331.4 & 1.0 & & 176.6 & 224.7 & & & 194.2 \\
\hline Queue Delay & & 0.0 & & & 0.0 & 0.0 & & 0.0 & 0.0 & & & 0.0 \\
\hline Total Delay & & 233.0 & & & 331.4 & 1.0 & & 176.6 & 224.7 & & & 194.2 \\
\hline LOS & & F & & & F & A & & F & F & & & F \\
\hline Approach Delay & & 233.0 & & & 164.1 & & & & 219.6 & & & \\
\hline Approach LOS & & F & & & F & & & & F & & & \\
\hline Queue Length 50th (ft) & & \(\sim 445\) & & & ~357 & 0 & & ~196 & \(\sim 682\) & & & ~180 \\
\hline Queue Length 95th (ft) & & m\#340 & & & \#469 & 0 & & \#338 & \#716 & & & m\#225 \\
\hline Internal Link Dist (ft) & & 371 & & & 313 & & & & 369 & & & \\
\hline Turn Bay Length (ft) & & & & & & 200 & & 200 & & & & 200 \\
\hline Base Capacity (vph) & & 484 & & & 320 & 1286 & & 156 & 1095 & & & 119 \\
\hline Starvation Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Spillback Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Storage Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Reduced v/c Ratio & & 1.43 & & & 1.63 & 0.41 & & 1.17 & 1.40 & & & 1.29 \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline \multicolumn{13}{|l|}{Area Type: CBD} \\
\hline \multicolumn{13}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Offset: 9 (6\%), Referenced to phase 1:NBSB, Start of Green} \\
\hline \multicolumn{13}{|l|}{Natural Cycle: 145} \\
\hline \multicolumn{13}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{13}{|l|}{Maximum v/c Ratio: 1.63} \\
\hline
\end{tabular}

Intersection Signal Delay: 181.1
Intersection LOS: F
Intersection Capacity Utilization 82.8\%
ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95 th percentile queue is metered by upstream signal.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard

\begin{tabular}{|c|c|c|c|}
\hline & & & \\
\hline Lane Group & SBT & SBR & \(\varnothing 2\) \\
\hline Control Delay & 69.5 & & \\
\hline Queue Delay & 0.0 & & \\
\hline Total Delay & 69.5 & & \\
\hline LOS & E & & \\
\hline Approach Delay & 90.1 & & \\
\hline Approach LOS & F & & \\
\hline Queue Length 50th (ft) & 275 & & \\
\hline Queue Length 95th (ft) & m317 & & \\
\hline Internal Link Dist (ft) & 731 & & \\
\hline Turn Bay Length (ft) & & & \\
\hline Base Capacity (vph) & 1072 & & \\
\hline Starvation Cap Reductn & 0 & & \\
\hline Spillback Cap Reductn & 0 & & \\
\hline Storage Cap Reductn & 0 & & \\
\hline Reduced v/c Ratio & 0.72 & & \\
\hline Intersection Summary & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 4 & \(\dagger\) & 1 & & \(\dagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & &  & & & ¢ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.91 & & & 0.95 & & & 0.93 & & & & \\
\hline Frt & & 0.985 & & & 0.986 & & & 0.982 & & & & \\
\hline Flt Protected & & 0.999 & & & 0.997 & & & 0.985 & & & & \\
\hline Satd. Flow (prot) & 0 & 1267 & 0 & 0 & 2587 & 0 & 0 & 1579 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.974 & & & 0.820 & & & 0.985 & & & & \\
\hline Satd. Flow (perm) & 0 & 1235 & 0 & 0 & 2128 & 0 & 0 & 1524 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 7 & & & 12 & & & 7 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 561 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 12.8 & \\
\hline Volume (vph) & 6 & 560 & 63 & 31 & 672 & 62 & 131 & 234 & 44 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.38 & 0.84 & 0.76 & 0.58 & 0.90 & 0.75 & 0.92 & 0.92 & 0.73 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 6\% & 0\% & 3\% & 7\% & 7\% & 2\% & 0\% & 5\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 16 & 667 & 83 & 53 & 747 & 83 & 142 & 254 & 60 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 766 & 0 & 0 & 883 & 0 & 0 & 456 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 78.0 & 78.0 & 0.0 & 78.0 & 78.0 & 0.0 & 62.0 & 62.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 55.7\% & 55.7\% & 0.0\% & 55.7\% & 55.7\% & 0.0\% & 44.3\% & 44.3\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 73.0 & 73.0 & & 73.0 & 73.0 & & 57.0 & 57.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 74.0 & & & 74.0 & & & 58.0 & & & & \\
\hline Actuated g/C Ratio & & 0.53 & & & 0.53 & & & 0.41 & & & & \\
\hline v/c Ratio & & 1.17 & & & 0.78 & & & 0.72 & & & & \\
\hline Control Delay & & 114.2 & & & 20.9 & & & 41.3 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{ }{*}\) & & & & \(\longleftarrow\) & & 4 & \(\dagger\) & \(>\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & & 153.5 & & & 3.4 & & & 0.0 & & & & \\
\hline Total Delay & & 267.7 & & & 24.3 & & & 41.3 & & & & \\
\hline LOS & & F & & & C & & & D & & & & \\
\hline Approach Delay & & 267.7 & & & 24.3 & & & 41.3 & & & & \\
\hline Approach LOS & & F & & & C & & & D & & & & \\
\hline Queue Length 50th (ft) & & \(\sim 825\) & & & 121 & & & 338 & & & & \\
\hline Queue Length 95th (ft) & & m\#895 & & & m97 & & & 476 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 481 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 656 & & & 1130 & & & 635 & & & & \\
\hline Starvation Cap Reductn & & 150 & & & 162 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 15 & & & 0 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.51 & & & 0.91 & & & 0.72 & & & & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 80 ( \(57 \%\) ), Referenced to phase 6:, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: \(116.6 \quad\) Intersection LOS: F
Intersection Capacity Utilization 75.2\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & 4 & \(\dagger\) & & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \({ }^{\text {f }}\) & & & & & & ¢ & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 9 & 9 & 9 & 14 & 14 & 14 & 12 & 12 & 12 & 10 & 10 & 10 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & & & & 50 & 50 & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & & & & 0 & 0 & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Frt & & 0.983 & & & 0.950 & & & & & & 0.990 & \\
\hline Flt Protected & & 0.994 & & & 0.996 & & & & & & 0.976 & \\
\hline Satd. Flow (prot) & 0 & 1407 & 0 & 0 & 3043 & 0 & 0 & 0 & 0 & 0 & 1448 & 0 \\
\hline Flt Permitted & & 0.691 & & & 0.821 & & & & & & 0.976 & \\
\hline Satd. Flow (perm) & 0 & 978 & 0 & 0 & 2509 & 0 & 0 & 0 & 0 & 0 & 1448 & 0 \\
\hline Right Turn on Red & & & No & & & No & & & No & & & No \\
\hline \multicolumn{13}{|l|}{Satd. Flow (RTOR)} \\
\hline Headway Factor & 1.30 & 1.30 & 1.30 & 1.05 & 1.05 & 1.05 & 1.14 & 1.14 & 1.14 & 1.25 & 1.25 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 555 & & & 270 & & & 349 & & & 585 & \\
\hline Travel Time (s) & & 12.6 & & & 6.1 & & & 7.9 & & & 13.3 & \\
\hline Volume (vph) & 58 & 476 & 53 & 58 & 493 & 252 & 0 & 0 & 0 & 153 & 131 & 21 \\
\hline Peak Hour Factor & 0.72 & 0.96 & 0.64 & 0.95 & 0.96 & 0.88 & 0.92 & 0.92 & 0.92 & 0.91 & 0.91 & 0.83 \\
\hline Heavy Vehicles (\%) & 5\% & 8\% & 2\% & 12\% & 11\% & 1\% & 2\% & 2\% & 2\% & 4\% & 7\% & 20\% \\
\hline Parking (\#/hr) & & & 0 & & & 0 & & & & & & 0 \\
\hline Adj. Flow (vph) & 81 & 496 & 83 & 61 & 514 & 286 & 0 & 0 & & 168 & 144 & 25 \\
\hline Lane Group Flow (vph) & 0 & 660 & 0 & 0 & 861 & 0 & 0 & 0 & 0 & 0 & 337 & 0 \\
\hline Turn Type & Perm & & & Perm & & & & & & Split & & \\
\hline Protected Phases & & 1 & & & 1 & & & & & 9 & 9 & \\
\hline Permitted Phases & 1 & & & & & & & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & & & & 9 & 9 & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & & & & 8.0 & 8.0 & \\
\hline Minimum Split (s) & 12.0 & 12.0 & & 12.0 & 12.0 & & & & & 12.0 & 12.0 & \\
\hline Total Split (s) & 77.0 & 77.0 & 0.0 & 77.0 & 77.0 & 0.0 & 0.0 & 0.0 & 0.0 & 39.0 & 39.0 & 0.0 \\
\hline Total Split (\%) & 55.0\% & 55.0\% & 0.0\% & 55.0\% & 55.0\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% & 27.9\% & 27.9\% & 0.0\% \\
\hline Maximum Green (s) & 73.0 & 73.0 & & 73.0 & 73.0 & & & & & 35.0 & 35.0 & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & & & & 3.0 & 3.0 & \\
\hline All-Red Time (s) & 1.0 & 1.0 & & 1.0 & 1.0 & & & & & 1.0 & 1.0 & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & & & & 2.0 & 2.0 & \\
\hline Recall Mode & C-Max & C-Max & & C-Max & C-Max & & & & & None & None & \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 98.1 & & & 98.1 & & & & & & 33.9 & \\
\hline Actuated g/C Ratio & & 0.70 & & & 0.70 & & & & & & 0.24 & \\
\hline v/c Ratio & & 0.96 & & & 0.49 & & & & & & 0.96 & \\
\hline Control Delay & & 47.3 & & & 4.0 & & & & & & 91.5 & \\
\hline Queue Delay & & 53.9 & & & 1.6 & & & & & & 661.1 & \\
\hline Total Delay & & 101.2 & & & 5.6 & & & & & & 752.6 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}

4: Tremont Street \& Parker Street
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{ }{*}\) & & & & - & 4 & 4 & \(\dagger\) & 7 & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & F & & & A & & & & & & F & \\
\hline Approach Delay & & 101.2 & & & 5.6 & & & & & & 752.6 & \\
\hline Approach LOS & & F & & & A & & & & & & F & \\
\hline Queue Length 50th (ft) & & 522 & & & 64 & & & & & & 302 & \\
\hline Queue Length 95th (ft) & & \#847 & & & 104 & & & & & & \#491 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 686 & & & 1759 & & & & & & 362 & \\
\hline Starvation Cap Reductn & & 0 & & & 678 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 102 & & & 0 & & & & & & 360 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.13 & & & 0.80 & & & & & & 168.50 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(90(64 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: \(175.1 \quad\) Intersection LOS: F
Intersection Capacity Utilization 89.4\% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th \((\mathrm{ft})\) \\
Queue Length 95th ft ) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 7 & \[
4
\] & \(\uparrow\) & P & & \(\downarrow\) & & & & \\
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Approach LOS & C & & A & & & D & & & & \\
\hline Queue Length 50th (ft) & 34 & 0 & 67 & 10 & 125 & 390 & & & & \\
\hline Queue Length 95th (ft) & 68 & 24 & 104 & m5 & 196 & 470 & & & & \\
\hline Internal Link Dist (ft) & 506 & & 81 & & & 465 & & & & \\
\hline \multicolumn{11}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & 531 & 774 & 2524 & 857 & 248 & 1340 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 580 & 611 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 334 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.10 & 0.07 & 0.92 & 0.69 & 0.57 & 0.95 & & & & \\
\hline Intersection Summary & & & & & & & & & & \\
\hline
\end{tabular}

\section*{Area Type: \\ Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 89 (64\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 24.1
Intersection LOS: C
Intersection Capacity Utilization 52.5\%
ICU Level of Service A
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & \(t\) & & 4 & 7 & & \(\dagger\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * \({ }^{\text {c }}\) & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 6 & 109 & 379 & 0 & 0 & 263 & \\
\hline Peak Hour Factor & 0.50 & 0.85 & 0.92 & 0.25 & 0.92 & 0.97 & \\
\hline Hourly flow rate (vph) & 12 & 128 & 412 & 0 & 0 & 271 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed (ft/s) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 683 & 412 & & & 412 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu, unblocked vol & 683 & 412 & & & 412 & & \\
\hline tC, single (s) & 6.4 & 6.3 & & & 4.1 & & \\
\hline tC, 2 stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.4 & & & 2.2 & & \\
\hline p0 queue free \% & 97 & 80 & & & 100 & & \\
\hline cM capacity (veh/h) & 418 & 627 & & & 1158 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 140 & 412 & 271 & & & & \\
\hline Volume Left & 12 & 0 & 0 & & & & \\
\hline Volume Right & 128 & 0 & 0 & & & & \\
\hline cSH & 601 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.23 & 0.24 & 0.16 & & & & \\
\hline Queue Length 95th (ft) & 22 & 0 & 0 & & & & \\
\hline Control Delay (s) & 12.8 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 12.8 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 2.2 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 36.7\% & & ICU Leve & of Service & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\varnothing 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & M & & \({ }^{7}\) & 个舟虫 & 个 \({ }^{\text {a }}\) & & & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width（ft） & 14 & 14 & 11 & 11 & 11 & 11 & & & & & \\
\hline Storage Length（ft） & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector（ft） & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector（ft） & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed（mph） & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.943 & & & & 0.990 & & & & & & \\
\hline Flt Protected & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（prot） & 1576 & 0 & 1540 & 4258 & 2811 & 0 & & & & & \\
\hline Flt Permitted & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（perm） & 1576 & 0 & 1540 & 4258 & 2811 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd．Flow（RTOR） & 22 & & & & 10 & & & & & & \\
\hline Headway Factor & 1.05 & 1.05 & 1.19 & 1.21 & 1.27 & 1.19 & & & & & \\
\hline Link Speed（mph） & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance（ft） & 984 & & & 811 & 162 & & & & & & \\
\hline Travel Time（s） & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume（vph） & 186 & 132 & 127 & 1392 & 1245 & 81 & & & & & \\
\hline Peak Hour Factor & 0.87 & 0.85 & 0.82 & 0.96 & 0.92 & 0.82 & & & & & \\
\hline Heavy Vehicles（\％） & 9\％ & 2\％ & 2\％ & 5\％ & 5\％ & 6\％ & & & & & \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 7 & 0 & 7 & & & & & \\
\hline Parking（\＃／hr） & & & & & 0 & 0 & & & & & \\
\hline Adj．Flow（vph） & 214 & 155 & 155 & 1450 & 1353 & 99 & & & & & \\
\hline Lane Group Flow（vph） & 369 & 0 & 155 & 1450 & 1452 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline Permitted Phases & & & & & & & & & & & \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial（s） & 8.0 & & 8.0 & 8.0 & & & 4.0 & 1.0 & 8.0 & 4.0 & 4.0 \\
\hline Minimum Split（s） & 13.0 & & 13.0 & 21.0 & & & 26.0 & 4.0 & 13.0 & 21.0 & 20.0 \\
\hline Total Split（s） & 26.0 & 0.0 & 16.0 & 52.0 & 94.0 & 0.0 & 60.0 & 4.0 & 24.0 & 34.0 & 60.0 \\
\hline Total Split（\％） & 18．6\％ & 0．0\％ & 11．4\％ & 37．1\％ & 67．1\％ & 0．0\％ & 43\％ & 3\％ & 17\％ & 24\％ & 43\％ \\
\hline Maximum Green（s） & 21.0 & & 11.0 & 47.0 & & & 55.0 & 2.0 & 19.0 & 29.0 & 56.0 \\
\hline Yellow Time（s） & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All－Red Time（s） & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead／Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead－Lag Optimize？ & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension（s） & 2.0 & & 2.0 & 3.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & None & C－Max & & & C－Max & None & None & None & None \\
\hline Walk Time（s） & & & & 5.0 & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & & 11.0 & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & & 0 & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 26.7 & & 12.0 & 54.6 & 89.3 & & & & & & \\
\hline Actuated g／C Ratio & 0.19 & & 0.09 & 0.39 & 0.64 & & & & & & \\
\hline v／c Ratio & 1.16 & & 1.17 & 0.87 & 0.81 & & & & & & \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & & & & & 4 & \(\dagger\) & 7 & 14 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & \({ }_{\text {f }}\) & & & \(\uparrow \uparrow\) & 「 & & \% & 恌t & & & 7 \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length (ft) & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util. Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.964 & & & & 0.850 & & & 0.986 & & & \\
\hline Flt Protected & & 0.985 & & & 0.991 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (prot) & 0 & 2735 & 0 & 0 & 3126 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1233 \\
\hline Flt Permitted & & 0.553 & & & 0.543 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (perm) & 0 & 1535 & 0 & 0 & 1713 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1233 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd. Flow (RTOR) & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance (ft) & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time (s) & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume (vph) & 189 & 322 & 149 & 63 & 294 & 341 & 1 & 133 & 991 & 98 & 3 & 164 \\
\hline Peak Hour Factor & 0.83 & 0.92 & 0.83 & 0.83 & 0.89 & 0.82 & 0.25 & 0.89 & 0.86 & 0.85 & 0.38 & 0.89 \\
\hline Heavy Vehicles (\%) & 1\% & 5\% & 3\% & 3\% & 3\% & 15\% & 0\% & 3\% & 4\% & 3\% & 0\% & 24\% \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking (\#/hr) & & 1 & 1 & & & & & & & & & \\
\hline Adj. Flow (vph) & 228 & 350 & 180 & 76 & 330 & 416 & 4 & 149 & 1152 & 115 & 8 & 184 \\
\hline Lane Group Flow (vph) & 0 & 758 & 0 & 0 & 406 & 416 & 0 & 153 & 1267 & 0 & 0 & 192 \\
\hline Turn Type & D.P+P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial (s) & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split (s) & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split (s) & 15.0 & 40.0 & 0.0 & 25.0 & 25.0 & 0.0 & 20.0 & 20.0 & 42.0 & 0.0 & 20.0 & 20.0 \\
\hline Total Split (\%) & 10.7\% & 28.6\% & 0.0\% & 17.9\% & 17.9\% & 0.0\% & 14.3\% & 14.3\% & 30.0\% & 0.0\% & 14.3\% & 14.3\% \\
\hline Maximum Green (s) & 9.0 & & & 18.0 & 18.0 & & 14.0 & 14.0 & 36.0 & & 14.0 & 14.0 \\
\hline Yellow Time (s) & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All-Red Time (s) & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead/Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead-Lag Optimize? & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension (s) & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C-Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 32.0 & & & 21.0 & 140.0 & & 16.0 & 38.0 & & & 16.0 \\
\hline Actuated g/C Ratio & & 0.23 & & & 0.15 & 1.00 & & 0.11 & 0.27 & & & 0.11 \\
\hline v/c Ratio & & 1.70 & & & 1.62 dl & 0.33 & & 0.91 & 1.09 & & & 1.36 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & \(\dagger\) & + & 4 & * \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Control Delay & & 349.6 & & & 316.5 & 0.7 & & 110.0 & 101.9 & & & 229.7 \\
\hline Queue Delay & & 0.0 & & & 0.0 & 0.0 & & 0.0 & 0.0 & & & 0.0 \\
\hline Total Delay & & 349.6 & & & 316.5 & 0.7 & & 110.0 & 101.9 & & & 229.7 \\
\hline LOS & & F & & & F & A & & F & F & & & F \\
\hline Approach Delay & & 349.6 & & & 156.7 & & & & 102.8 & & & \\
\hline Approach LOS & & F & & & F & & & & F & & & \\
\hline Queue Length 50th (ft) & & \(\sim 544\) & & & ~275 & 0 & & 140 & \(\sim 474\) & & & \(\sim 226\) \\
\hline Queue Length 95th (ft) & & m\#526 & & & \#380 & 0 & & \#272 & \#528 & & & m\#301 \\
\hline Internal Link Dist (ft) & & 371 & & & 313 & & & & 369 & & & \\
\hline Turn Bay Length (ft) & & & & & & 200 & & 200 & & & & 200 \\
\hline Base Capacity (vph) & & 445 & & & 257 & 1264 & & 168 & 1162 & & & 141 \\
\hline Starvation Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Spillback Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Storage Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Reduced v/c Ratio & & 1.70 & & & 1.58 & 0.33 & & 0.91 & 1.09 & & & 1.36 \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline \multicolumn{13}{|l|}{Area Type: CBD} \\
\hline \multicolumn{13}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Offset: 9 (6\%), Referenced to phase 1:NBSB, Start of Green} \\
\hline \multicolumn{13}{|l|}{Natural Cycle: 145} \\
\hline \multicolumn{13}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{13}{|l|}{Maximum v/c Ratio: 1.70} \\
\hline \multicolumn{13}{|l|}{Intersection Signal Delay: 161.0 Intersection LOS: F} \\
\hline
\end{tabular}

Intersection Signal Delay: \(161.0 \quad\) Intersection LOS: F
Intersection Capacity Utilization 80.8\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95 th percentile queue is metered by upstream signal.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard


\begin{tabular}{lrr} 
Lane Group & SBT & SBR \(\quad ø 2\) \\
\hline Control Delay & 78.4 & \\
Queue Delay & 29.0 & \\
Total Delay & 107.4 & \\
LOS & F & \\
Approach Delay & 123.1 & F \\
Approach LOS & \(\sim 485\) & \\
Queue Length 50th (ft) & \(\sim\) \\
Queue Length 95th ( ft\()\) & m\#555 & \\
Internal Link Dist ft\()\) & 731 & \\
Turn Bay Length (ft) & & \\
Base Capacity (vph) & 1202 \\
Starvation Cap Reductn & 0 \\
Spillback Cap Reductn & 71 & \\
Storage Cap Reductn & 0 & \\
Reduced v/c Ratio & 1.15 \\
Intersection Summary & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & 7 & & & 4 & \(\dagger\) & & & \(\ddagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & \$ & & & \(\uparrow{ }^{4}\) & & & \$ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.89 & & & 0.94 & & & 0.93 & & & & \\
\hline Frt & & 0.981 & & & 0.985 & & & 0.981 & & & & \\
\hline Flt Protected & & 0.999 & & & 0.996 & & & 0.984 & & & & \\
\hline Satd. Flow (prot) & 0 & 1261 & 0 & 0 & 2655 & 0 & 0 & 1561 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.972 & & & 0.812 & & & 0.984 & & & & \\
\hline Satd. Flow (perm) & 0 & 1227 & 0 & 0 & 2165 & 0 & 0 & 1504 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 10 & & & 15 & & & 6 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 333 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 7.6 & \\
\hline Volume (vph) & 8 & 617 & 86 & 39 & 538 & 60 & 101 & 160 & 42 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.40 & 0.94 & 0.80 & 0.68 & 0.88 & 0.82 & 0.91 & 0.87 & 0.85 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 3\% & 0\% & 3\% & 4\% & 0\% & 2\% & 2\% & 2\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 20 & 656 & 108 & 57 & 611 & 73 & 111 & 184 & 49 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 784 & 0 & 0 & 741 & 0 & 0 & 344 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 88.0 & 88.0 & 0.0 & 88.0 & 88.0 & 0.0 & 52.0 & 52.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 62.9\% & 62.9\% & 0.0\% & 62.9\% & 62.9\% & 0.0\% & 37.1\% & 37.1\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 83.0 & 83.0 & & 83.0 & 83.0 & & 47.0 & 47.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 84.0 & & & 84.0 & & & 48.0 & & & & \\
\hline Actuated g/C Ratio & & 0.60 & & & 0.60 & & & 0.34 & & & & \\
\hline v/c Ratio & & 1.06 & & & 0.57 & & & 0.66 & & & & \\
\hline Control Delay & & 62.9 & & & 24.9 & & & 45.7 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 4 & \(\dagger\) & \(p\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & & 121.3 & & & 15.1 & & & 0.0 & & & & \\
\hline Total Delay & & 184.3 & & & 40.0 & & & 45.7 & & & & \\
\hline LOS & & F & & & D & & & D & & & & \\
\hline Approach Delay & & 184.3 & & & 40.0 & & & 45.7 & & & & \\
\hline Approach LOS & & F & & & D & & & D & & & & \\
\hline Queue Length 50th (ft) & & \(\sim 564\) & & & 327 & & & 261 & & & & \\
\hline Queue Length 95th (ft) & & m\#917 & & & m205 & & & 359 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 253 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 740 & & & 1305 & & & 520 & & & & \\
\hline Starvation Cap Reductn & & 156 & & & 556 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 382 & & & 1 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.34 & & & 0.99 & & & 0.66 & & & & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6\%), Referenced to phase 6:, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 101.6 Intersection LOS: F
Intersection Capacity Utilization 75.9\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{lrrrrrrrrrrrrrr}
\hline & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}

4: Tremont Street \& Parker Street
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & \(\rightarrow\) & & 7 & - & 4 & 4 & \(\dagger\) & 1 & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & E & & & C & & & & & & F & \\
\hline Approach Delay & & 59.4 & & & 24.6 & & & & & & 281.9 & \\
\hline Approach LOS & & E & & & C & & & & & & F & \\
\hline Queue Length 50th (ft) & & 466 & & & 335 & & & & & & \(\sim 547\) & \\
\hline Queue Length 95th (ft) & & 698 & & & 361 & & & & & & \#717 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 867 & & & 1581 & & & & & & 451 & \\
\hline Starvation Cap Reductn & & 0 & & & 638 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 182 & & & 0 & & & & & & 104 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.05 & & & 0.83 & & & & & & 1.48 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(43(31 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 102.6 Intersection LOS: F
Intersection Capacity Utilization 93.5\% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th (ft) \\
Queue Length 95th (ft) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Queue Length 50th (ft) & 138 & 48 & 82 & 0 & 141 & 503 & & & & \\
\hline Queue Length 95th (ft) & 204 & 84 & m119 & m0 & 219 & 597 & & & & \\
\hline Internal Link Dist (ft) & 517 & & 82 & & & 466 & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & \\
\hline Base Capacity (vph) & 708 & 924 & 1982 & 1047 & 253 & 1517 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 358 & 784 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 255 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.31 & 0.18 & 0.98 & 0.47 & 0.63 & 0.97 & & & & \\
\hline
\end{tabular}

\section*{Intersection Summary}

\section*{Area Type: Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 7 (5\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 30.7 Intersection LOS: C
Intersection Capacity Utilization 57.8\% ICU Level of Service B
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street


\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\varnothing 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & M & & \({ }^{7}\) & 个虾 & 个 \({ }^{\text {a }}\) & & & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width（ft） & 13 & 12 & 10 & 11 & 11 & 12 & & & & & \\
\hline Storage Length（ft） & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector（ft） & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector（ft） & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed（mph） & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.973 & & & & 0.976 & & & & & & \\
\hline Flt Protected & 0.961 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（prot） & 1556 & 0 & 1472 & 4172 & 2550 & 0 & & & & & \\
\hline Flt Permitted & 0.961 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（perm） & 1556 & 0 & 1472 & 4172 & 2550 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd．Flow（RTOR） & 8 & & & & 20 & & & & & & \\
\hline Headway Factor & 1.10 & 1.14 & 1.25 & 1.21 & 1.27 & 1.14 & & & & & \\
\hline Link Speed（mph） & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance（ft） & 984 & & & 811 & 161 & & & & & & \\
\hline Travel Time（s） & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume（vph） & 153 & 43 & 319 & 1657 & 793 & 142 & & & & & \\
\hline Peak Hour Factor & 0.74 & 0.84 & 0.77 & 0.92 & 0.85 & 0.78 & & & & & \\
\hline Heavy Vehicles（\％） & 7\％ & 3\％ & 3\％ & 7\％ & 15\％ & 10\％ & & & & & \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 8 & 0 & 8 & & & & & \\
\hline Parking（\＃／hr） & & & & & 0 & 0 & & & & & \\
\hline Adj．Flow（vph） & 207 & 51 & 414 & 1801 & 933 & 182 & & & & & \\
\hline Lane Group Flow（vph） & 258 & 0 & 414 & 1801 & 1115 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline Permitted Phases & & & & & & & & & & & \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial（s） & 8.0 & & 8.0 & 8.0 & & & 8.0 & 1.0 & 8.0 & 3.0 & 4.0 \\
\hline Minimum Split（s） & 13.0 & & 13.0 & 13.0 & & & 30.0 & 4.0 & 13.0 & 8.0 & 20.0 \\
\hline Total Split（s） & 29.0 & 0.0 & 37.0 & 64.0 & 69.0 & 0.0 & 52.0 & 5.0 & 25.0 & 17.0 & 46.0 \\
\hline Total Split（\％） & 20．7\％ & 0．0\％ & 26．4\％ & 45．7\％ & 49．3\％ & 0．0\％ & 37\％ & 4\％ & 18\％ & 12\％ & 33\％ \\
\hline Maximum Green（s） & 24.0 & & 32.0 & 59.0 & & & 47.0 & 3.0 & 20.0 & 12.0 & 42.0 \\
\hline Yellow Time（s） & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All－Red Time（s） & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead／Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead－Lag Optimize？ & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension（s） & 2.0 & & 2.0 & 2.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & Max & C－Max & & & C－Max & None & None & Max & None \\
\hline Walk Time（s） & & & & & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & & & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & & & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 24.2 & & 33.8 & 69.4 & 70.0 & & & & & & \\
\hline Actuated g／C Ratio & 0.17 & & 0.24 & 0.50 & 0.50 & & & & & & \\
\hline v／c Ratio & 0.93 & & 1.17 & 0.87 & 0.87 & & & & & & \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & \(\dagger\) & 4 & \(\dagger\) & & 4 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & \({ }^{\text {A }}\) & & & \(\uparrow \uparrow\) & 「 & & \％ & 惺官 & & & \％ \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width（ft） & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length（ft） & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector（ft） & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector（ft） & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed（mph） & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util．Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.978 & & & & 0.850 & & & 0.992 & & & \\
\hline Flt Protected & & 0.978 & & & 0.994 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（prot） & 0 & 2691 & 0 & 0 & 2893 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Flt Permitted & & 0.578 & & & 0.642 & & & 0.950 & & & & 0.950 \\
\hline Satd．Flow（perm） & 0 & 1591 & 0 & 0 & 1869 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd．Flow（RTOR） & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed（mph） & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance（ft） & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time（s） & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume（vph） & 265 & 259 & 79 & 57 & 407 & 464 & 3 & 152 & 1237 & 55 & 8 & 122 \\
\hline Peak Hour Factor & 0.85 & 0.93 & 0.76 & 0.86 & 0.89 & 0.87 & 0.38 & 0.87 & 0.85 & 0.70 & 0.67 & 0.86 \\
\hline Heavy Vehicles（\％） & 4\％ & 8\％ & 5\％ & 16\％ & 11\％ & 13\％ & 0\％ & 4\％ & 5\％ & 8\％ & 0\％ & 39\％ \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking（\＃／hr） & & 1 & 1 & & & & & & & & & \\
\hline Adj．Flow（vph） & 312 & 278 & 104 & 66 & 457 & 533 & 8 & 175 & 1455 & 79 & 12 & 142 \\
\hline Lane Group Flow（vph） & 0 & 694 & 0 & 0 & 523 & 533 & 0 & 183 & 1534 & 0 & 0 & 154 \\
\hline Turn Type & D．P＋\({ }^{\text {P }}\) & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial（s） & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split（s） & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split（s） & 15.0 & 43.0 & 0.0 & 28.0 & 28.0 & 0.0 & 19.0 & 19.0 & 40.0 & 0.0 & 19.0 & 19.0 \\
\hline Total Split（\％） & 10．7\％ & 30．7\％ & 0．0\％ & 20．0\％ & 20．0\％ & 0．0\％ & 13．6\％ & 13．6\％ & 28．6\％ & 0．0\％ & 13．6\％ & 13．6\％ \\
\hline Maximum Green（s） & 9.0 & & & 21.0 & 21.0 & & 13.0 & 13.0 & 34.0 & & 13.0 & 13.0 \\
\hline Yellow Time（s） & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All－Red Time（s） & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead／Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead－Lag Optimize？ & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension（s） & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C－Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time（s）} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk（s）} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls（\＃／hr）} \\
\hline Act Effct Green（s） & & 35.0 & & & 24.0 & 140.0 & & 15.0 & 36.0 & & & 15.0 \\
\hline Actuated g／C Ratio & & 0.25 & & & 0.17 & 1.00 & & 0.11 & 0.26 & & & 0.11 \\
\hline v／c Ratio & & 2.12 dl & & & 1.63 & 0.41 & & 1.17 & 1.40 & & & 1.29 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & \(\dagger\) & \(p\) & 4 & * \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Control Delay & & 233.1 & & & 335.2 & 1.0 & & 178.6 & 224.7 & & & 197.0 \\
\hline Queue Delay & & 0.0 & & & 0.0 & 0.0 & & 0.0 & 0.0 & & & 0.0 \\
\hline Total Delay & & 233.1 & & & 335.2 & 1.0 & & 178.6 & 224.7 & & & 197.0 \\
\hline LOS & & F & & & F & A & & F & F & & & F \\
\hline Approach Delay & & 233.1 & & & 166.5 & & & & 219.8 & & & \\
\hline Approach LOS & & F & & & F & & & & F & & & \\
\hline Queue Length 50th (ft) & & \(\sim 444\) & & & ~361 & 0 & & ~198 & \(\sim 682\) & & & ~182 \\
\hline Queue Length 95th (ft) & & m\#316 & & & \#472 & 0 & & \#340 & \#716 & & & m\#226 \\
\hline Internal Link Dist (ft) & & 371 & & & 313 & & & & 369 & & & \\
\hline Turn Bay Length (ft) & & & & & & 200 & & 200 & & & & 200 \\
\hline Base Capacity (vph) & & 484 & & & 320 & 1286 & & 156 & 1095 & & & 119 \\
\hline Starvation Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Spillback Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Storage Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Reduced v/c Ratio & & 1.43 & & & 1.63 & 0.41 & & 1.17 & 1.40 & & & 1.29 \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline \multicolumn{13}{|l|}{Area Type: CBD} \\
\hline \multicolumn{13}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Offset: 9 (6\%), Referenced to phase 1:NBSB, Start of Green} \\
\hline \multicolumn{13}{|l|}{Natural Cycle: 145} \\
\hline \multicolumn{13}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{13}{|l|}{Maximum v/c Ratio: 1.63} \\
\hline \multicolumn{5}{|l|}{Intersection Signal Delay: 181.8} & \multicolumn{8}{|l|}{Intersection LOS: F} \\
\hline \multicolumn{13}{|l|}{Intersection Capacity Utilization 82.9\% ICU Level of Service E} \\
\hline \multicolumn{13}{|l|}{Analysis Period (min) 15} \\
\hline \multicolumn{13}{|l|}{~ Volume exceeds capacity, queue is theoretically infinite.} \\
\hline \multicolumn{13}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{13}{|l|}{\# 95th percentile volume exceeds capacity, queue may be longer.} \\
\hline \multicolumn{13}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{13}{|l|}{\(m\) Volume for 95th percentile queue is metered by upstream signal.} \\
\hline dl Defacto Left Lane. & Recode & with 1 & hough & ane as & a left la & & & & & & & \\
\hline
\end{tabular}

Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard

\begin{tabular}{|c|c|c|c|}
\hline & & & \\
\hline Lane Group & SBT & SBR & \(\varnothing 2\) \\
\hline Control Delay & 69.4 & & \\
\hline Queue Delay & 0.0 & & \\
\hline Total Delay & 69.4 & & \\
\hline LOS & E & & \\
\hline Approach Delay & 90.6 & & \\
\hline Approach LOS & F & & \\
\hline Queue Length 50th (ft) & 275 & & \\
\hline Queue Length 95th (ft) & m316 & & \\
\hline Internal Link Dist (ft) & 731 & & \\
\hline Turn Bay Length (ft) & & & \\
\hline Base Capacity (vph) & 1072 & & \\
\hline Starvation Cap Reductn & 0 & & \\
\hline Spillback Cap Reductn & 0 & & \\
\hline Storage Cap Reductn & 0 & & \\
\hline Reduced v/c Ratio & 0.72 & & \\
\hline \multicolumn{4}{|l|}{Intersection Summary} \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 4 & \(\dagger\) & & & \(\dagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \({ }_{4}{ }^{\text {a }}\) & & & ¢ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.91 & & & 0.94 & & & 0.93 & & & & \\
\hline Frt & & 0.986 & & & 0.985 & & & 0.983 & & & & \\
\hline Flt Protected & & 0.998 & & & 0.997 & & & 0.985 & & & & \\
\hline Satd. Flow (prot) & 0 & 1269 & 0 & 0 & 2575 & 0 & 0 & 1582 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.955 & & & 0.820 & & & 0.985 & & & & \\
\hline Satd. Flow (perm) & 0 & 1214 & 0 & 0 & 2118 & 0 & 0 & 1528 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 7 & & & 13 & & & 7 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 561 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 12.8 & \\
\hline Volume (vph) & 9 & 560 & 63 & 31 & 672 & 67 & 131 & 240 & 44 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.38 & 0.84 & 0.76 & 0.58 & 0.90 & 0.75 & 0.92 & 0.92 & 0.73 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 6\% & 0\% & 3\% & 7\% & 7\% & 2\% & 0\% & 5\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 24 & 667 & 83 & 53 & 747 & 89 & 142 & 261 & 60 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 774 & 0 & 0 & 889 & 0 & 0 & 463 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 78.0 & 78.0 & 0.0 & 78.0 & 78.0 & 0.0 & 62.0 & 62.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 55.7\% & 55.7\% & 0.0\% & 55.7\% & 55.7\% & 0.0\% & 44.3\% & 44.3\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 73.0 & 73.0 & & 73.0 & 73.0 & & 57.0 & 57.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 74.0 & & & 74.0 & & & 58.0 & & & & \\
\hline Actuated g/C Ratio & & 0.53 & & & 0.53 & & & 0.41 & & & & \\
\hline v/c Ratio & & 1.20 & & & 0.79 & & & 0.73 & & & & \\
\hline Control Delay & & 127.6 & & & 21.5 & & & 41.8 & & & & \\
\hline
\end{tabular}

3: Tremont Street \& Gurney Street
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & \(\square\) & 4 & 4 & \(\dagger\) & \(p\) & \(\downarrow\) & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & & 146.6 & & & 3.8 & & & 0.0 & & & & \\
\hline Total Delay & & 274.2 & & & 25.2 & & & 41.8 & & & & \\
\hline LOS & & F & & & C & & & D & & & & \\
\hline Approach Delay & & 274.2 & & & 25.2 & & & 41.8 & & & & \\
\hline Approach LOS & & F & & & C & & & D & & & & \\
\hline Queue Length 50th (ft) & & ~852 & & & 124 & & & 345 & & & & \\
\hline Queue Length 95th (ft) & & m\#911 & & & m97 & & & 484 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 481 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 645 & & & 1126 & & & 637 & & & & \\
\hline Starvation Cap Reductn & & 139 & & & 159 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 15 & & & 0 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.53 & & & 0.92 & & & 0.73 & & & & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 80 ( \(57 \%\) ), Referenced to phase 6:, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: \(119.5 \quad\) Intersection LOS: F
Intersection Capacity Utilization 78.2\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{lrrrrrrrrrrrrrr}
\hline & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}

4: Tremont Street \& Parker Street
a.m. Peak Hour
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{ }{*}\) & & & & - & 4 & 4 & \(\dagger\) & 7 & \(\checkmark\) & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & F & & & A & & & & & & F & \\
\hline Approach Delay & & 108.7 & & & 5.7 & & & & & & 752.4 & \\
\hline Approach LOS & & F & & & A & & & & & & F & \\
\hline Queue Length 50th (ft) & & 528 & & & 65 & & & & & & 306 & \\
\hline Queue Length 95th (ft) & & \#852 & & & 104 & & & & & & \#499 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 685 & & & 1754 & & & & & & 362 & \\
\hline Starvation Cap Reductn & & 0 & & & 685 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 107 & & & 0 & & & & & & 360 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.15 & & & 0.81 & & & & & & 170.00 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(90(64 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 178.6 Intersection LOS: F
Intersection Capacity Utilization 89.7\% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th \((\mathrm{ft})\) \\
Queue Length 95th ft ) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\otimes 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Approach LOS & C & & A & & & D & & & & \\
\hline Queue Length 50th (ft) & 34 & 0 & 68 & 10 & 125 & 390 & & & & \\
\hline Queue Length 95th (ft) & 68 & 24 & m105 & m5 & 196 & 470 & & & & \\
\hline Internal Link Dist (ft) & 506 & & 81 & & & 465 & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & \\
\hline Base Capacity (vph) & 531 & 776 & 2519 & 857 & 248 & 1340 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 581 & 612 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 334 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.10 & 0.07 & 0.93 & 0.69 & 0.57 & 0.95 & & & & \\
\hline Intersection Summary & & & & & & & & & & \\
\hline
\end{tabular}

\section*{Area Type: \\ Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 89 (64\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 24.2 Intersection LOS: C
Intersection Capacity Utilization 52.5\% ICU Level of Service A
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & \(t\) & & 4 & 7 & & \(\dagger\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * \({ }^{\text {c }}\) & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 7 & 113 & 381 & 0 & 0 & 263 & \\
\hline Peak Hour Factor & 0.50 & 0.85 & 0.92 & 0.25 & 0.92 & 0.97 & \\
\hline Hourly flow rate (vph) & 14 & 133 & 414 & 0 & 0 & 271 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed (ft/s) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 685 & 414 & & & 414 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu, unblocked vol & 685 & 414 & & & 414 & & \\
\hline tC, single (s) & 6.4 & 6.3 & & & 4.1 & & \\
\hline tC, 2 stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.4 & & & 2.2 & & \\
\hline p0 queue free \% & 97 & 79 & & & 100 & & \\
\hline cM capacity (veh/h) & 417 & 625 & & & 1156 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 147 & 414 & 271 & & & & \\
\hline Volume Left & 14 & 0 & 0 & & & & \\
\hline Volume Right & 133 & 0 & 0 & & & & \\
\hline cSH & 597 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.25 & 0.24 & 0.16 & & & & \\
\hline Queue Length 95th (ft) & 24 & 0 & 0 & & & & \\
\hline Control Delay (s) & 13.0 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 13.0 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 2.3 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 37.1\% & & ICU Leve & of Service & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & 4 & & & \(\downarrow\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\varnothing 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & M & & \({ }^{*}\) & 个椎 & 性 & & & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width（ft） & 14 & 14 & 11 & 11 & 11 & 11 & & & & & \\
\hline Storage Length（ft） & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector（ft） & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector（ft） & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed（mph） & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.943 & & & & 0.989 & & & & & & \\
\hline Flt Protected & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（prot） & 1577 & 0 & 1540 & 4258 & 2808 & 0 & & & & & \\
\hline Flt Permitted & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（perm） & 1577 & 0 & 1540 & 4258 & 2808 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd．Flow（RTOR） & 22 & & & & 10 & & & & & & \\
\hline Headway Factor & 1.05 & 1.05 & 1.19 & 1.21 & 1.27 & 1.19 & & & & & \\
\hline Link Speed（mph） & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance（ft） & 984 & & & 811 & 162 & & & & & & \\
\hline Travel Time（s） & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume（vph） & 189 & 135 & 127 & 1392 & 1245 & 84 & & & & & \\
\hline Peak Hour Factor & 0.87 & 0.85 & 0.82 & 0.96 & 0.92 & 0.82 & & & & & \\
\hline Heavy Vehicles（\％） & 9\％ & 2\％ & 2\％ & 5\％ & 5\％ & 6\％ & & & & & \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 7 & 0 & 7 & & & & & \\
\hline Parking（\＃／hr） & & & & & 0 & 0 & & & & & \\
\hline Adj．Flow（vph） & 217 & 159 & 155 & 1450 & 1353 & 102 & & & & & \\
\hline Lane Group Flow（vph） & 376 & 0 & 155 & 1450 & 1455 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline \multicolumn{12}{|l|}{Permitted Phases} \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial（s） & 8.0 & & 8.0 & 8.0 & & & 4.0 & 1.0 & 8.0 & 4.0 & 4.0 \\
\hline Minimum Split（s） & 13.0 & & 13.0 & 21.0 & & & 26.0 & 4.0 & 13.0 & 21.0 & 20.0 \\
\hline Total Split（s） & 26.0 & 0.0 & 16.0 & 52.0 & 94.0 & 0.0 & 60.0 & 4.0 & 24.0 & 34.0 & 60.0 \\
\hline Total Split（\％） & 18．6\％ & 0．0\％ & 11．4\％ & 37．1\％ & 67．1\％ & 0．0\％ & 43\％ & 3\％ & 17\％ & 24\％ & 43\％ \\
\hline Maximum Green（s） & 21.0 & & 11.0 & 47.0 & & & 55.0 & 2.0 & 19.0 & 29.0 & 56.0 \\
\hline Yellow Time（s） & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All－Red Time（s） & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead／Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead－Lag Optimize？ & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension（s） & 2.0 & & 2.0 & 3.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & None & C－Max & & & C－Max & None & None & None & None \\
\hline Walk Time（s） & & & & 5.0 & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & & 11.0 & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & & 0 & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 26.8 & & 12.0 & 54.6 & 89.2 & & & & & & \\
\hline Actuated g／C Ratio & 0.19 & & 0.09 & 0.39 & 0.64 & & & & & & \\
\hline v／c Ratio & 1.18 & & 1.17 & 0.87 & 0.81 & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & 4 & & & \(\checkmark\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\emptyset 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\theta 14\) \\
\hline Control Delay & 152.5 & & 140.7 & 59.1 & 9.1 & & & & & & \\
\hline Queue Delay & 64.4 & & 0.0 & 0.9 & 5.0 & & & & & & \\
\hline Total Delay & 216.9 & & 140.7 & 60.1 & 14.1 & & & & & & \\
\hline LOS & F & & F & E & B & & & & & & \\
\hline Approach Delay & 216.9 & & & 67.8 & 14.1 & & & & & & \\
\hline Approach LOS & F & & & E & B & & & & & & \\
\hline Queue Length 50th (ft) & ~390 & & ~172 & 496 & 156 & & & & & & \\
\hline Queue Length 95th (ft) & \#620 & & m\#165 & m447 & 120 & & & & & & \\
\hline Internal Link Dist (ft) & 904 & & & 731 & 82 & & & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & \\
\hline Base Capacity (vph) & 320 & & 132 & 1660 & 1889 & & & & & & \\
\hline Starvation Cap Reductn & 0 & & 0 & 0 & 368 & & & & & & \\
\hline Spillback Cap Reductn & 36 & & 0 & 62 & 0 & & & & & & \\
\hline Storage Cap Reductn & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Reduced v/c Ratio & 1.32 & & 1.17 & 0.91 & 0.96 & & & & & & \\
\hline \multicolumn{12}{|l|}{Intersection Summary} \\
\hline \multicolumn{12}{|l|}{Area Type: CBD} \\
\hline \multicolumn{12}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Offset: \(7(5 \%\) ), Referenced to phase 2:SBT and 6:NBT, Start of Yellow} \\
\hline \multicolumn{12}{|l|}{Natural Cycle: 120} \\
\hline \multicolumn{12}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{12}{|l|}{Maximum v/c Ratio: 1.18} \\
\hline \multicolumn{5}{|l|}{Intersection Signal Delay: 61.4} & \multicolumn{7}{|l|}{Intersection LOS: E} \\
\hline \multicolumn{5}{|l|}{Intersection Capacity Utilization 79.8\%} & \multicolumn{7}{|l|}{ICU Level of Service D} \\
\hline \multicolumn{12}{|l|}{Analysis Period (min) 15} \\
\hline \multicolumn{12}{|l|}{~ Volume exceeds capacity, queue is theoretically infinite.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\# 95th percentile volume exceeds capacity, queue may be longer.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\(m\) Volume for 95th percentile queue is metered by upstream signal.} \\
\hline
\end{tabular}

Splits and Phases: 1: Prentiss Street \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger 1\) & 4 & \(\dagger\) & & 4 & - \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & * \({ }^{\text {a }}\) & & & \(\uparrow \uparrow\) & 「 & & \% & 恌 & & & \({ }^{7}\) \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length (ft) & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector (ft) & - & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util. Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.964 & & & & 0.850 & & & 0.986 & & & \\
\hline Flt Protected & & 0.985 & & & 0.991 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (prot) & 0 & 2735 & 0 & 0 & 3126 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1233 \\
\hline Flt Permitted & & 0.553 & & & 0.542 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (perm) & 0 & 1535 & 0 & 0 & 1710 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1233 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd. Flow (RTOR) & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance (ft) & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time (s) & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume (vph) & 189 & 323 & 149 & 63 & 297 & 341 & 1 & 134 & 991 & 98 & & 166 \\
\hline Peak Hour Factor & 0.83 & 0.92 & 0.83 & 0.83 & 0.89 & 0.82 & 0.25 & 0.89 & 0.86 & 0.85 & 0.38 & 0.89 \\
\hline Heavy Vehicles (\%) & 1\% & 5\% & 3\% & 3\% & 3\% & 15\% & 0\% & 3\% & 4\% & 3\% & 0\% & 24\% \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking (\#/hr) & & 1 & 1 & & & & & & & & & \\
\hline Adj. Flow (vph) & 228 & 351 & 180 & 76 & 334 & 416 & 4 & 151 & 1152 & 115 & 8 & 187 \\
\hline Lane Group Flow (vph) & 0 & 759 & 0 & 0 & 410 & 416 & 0 & 155 & 1267 & 0 & 0 & 195 \\
\hline Turn Type & D.P+P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial (s) & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split (s) & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split (s) & 15.0 & 40.0 & 0.0 & 25.0 & 25.0 & 0.0 & 20.0 & 20.0 & 42.0 & 0.0 & 20.0 & 20.0 \\
\hline Total Split (\%) & 10.7\% & 28.6\% & 0.0\% & 17.9\% & 17.9\% & 0.0\% & 14.3\% & 14.3\% & 30.0\% & 0.0\% & 14.3\% & 14.3\% \\
\hline Maximum Green (s) & 9.0 & & & 18.0 & 18.0 & & 14.0 & 14.0 & 36.0 & & 14.0 & 14.0 \\
\hline Yellow Time (s) & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All-Red Time (s) & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead/Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead-Lag Optimize? & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension (s) & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C-Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 32.0 & & & 21.0 & 140.0 & & 16.0 & 38.0 & & & 16.0 \\
\hline Actuated g/C Ratio & & 0.23 & & & 0.15 & 1.00 & & 0.11 & 0.27 & & & 0.11 \\
\hline v/c Ratio & & 1.71 & & & 1.62dl & 0.33 & & 0.92 & 1.09 & & & 1.38 \\
\hline
\end{tabular}



Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard


\begin{tabular}{lrr} 
Lane Group & SBT & SBR \(\quad ø 2\) \\
\hline Control Delay & 78.8 & \\
Queue Delay & 30.4 & \\
Total Delay & 109.1 & \\
LOS & F & \\
Approach Delay & 125.8 & F \\
Approach LOS & \(\sim\) & \\
Queue Length 50th (ft) & \(\sim 486\) \\
Queue Length 95th ( ft\()\) & m\#554 & \\
Internal Link Dist ft\()\) & 731 & \\
Turn Bay Length (ft) & & \\
Base Capacity (vph) & 1202 \\
Starvation Cap Reductn & 0 \\
Spillback Cap Reductn & 74 & \\
Storage Cap Reductn & 0 & \\
Reduced v/c Ratio & 1.16 \\
Intersection Summary & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & & & & 4 & \(\dagger\) & \(p\) & & \(\downarrow\) & \(\checkmark\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \({ }^{\text {AT }}\) & & & \$ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.89 & & & 0.94 & & & 0.93 & & & & \\
\hline Frt & & 0.981 & & & 0.984 & & & 0.981 & & & & \\
\hline Flt Protected & & 0.999 & & & 0.996 & & & 0.984 & & & & \\
\hline Satd. Flow (prot) & 0 & 1261 & 0 & 0 & 2643 & 0 & 0 & 1561 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.968 & & & 0.812 & & & 0.984 & & & & \\
\hline Satd. Flow (perm) & 0 & 1222 & 0 & 0 & 2155 & 0 & 0 & 1506 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 10 & & & 16 & & & 6 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 333 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 7.6 & \\
\hline Volume (vph) & 9 & 617 & 86 & 39 & 538 & 64 & 101 & 164 & 42 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.40 & 0.94 & 0.80 & 0.68 & 0.88 & 0.82 & 0.91 & 0.87 & 0.85 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 3\% & 0\% & 3\% & 4\% & 0\% & 2\% & 2\% & 2\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 22 & 656 & 108 & 57 & 611 & 78 & 111 & 189 & 49 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 786 & 0 & 0 & 746 & 0 & 0 & 349 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 88.0 & 88.0 & 0.0 & 88.0 & 88.0 & 0.0 & 52.0 & 52.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 62.9\% & 62.9\% & 0.0\% & 62.9\% & 62.9\% & 0.0\% & 37.1\% & 37.1\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 83.0 & 83.0 & & 83.0 & 83.0 & & 47.0 & 47.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 84.0 & & & 84.0 & & & 48.0 & & & & \\
\hline Actuated g/C Ratio & & 0.60 & & & 0.60 & & & 0.34 & & & & \\
\hline \(\mathrm{v} / \mathrm{c}\) Ratio & & 1.07 & & & 0.57 & & & 0.67 & & & & \\
\hline Control Delay & & 65.2 & & & 25.2 & & & 46.1 & & & & \\
\hline
\end{tabular}

3: Tremont Street \& Gurney Street
p.m. Peak Hour
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & & & 4 & 4 & \(\dagger\) & P & \(\checkmark\) & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & & 121.2 & & & 17.2 & & & 0.0 & & & & \\
\hline Total Delay & & 186.5 & & & 42.4 & & & 46.1 & & & & \\
\hline LOS & & F & & & D & & & D & & & & \\
\hline Approach Delay & & 186.5 & & & 42.4 & & & 46.1 & & & & \\
\hline Approach LOS & & F & & & D & & & D & & & & \\
\hline Queue Length 50th (ft) & & \(\sim 642\) & & & 332 & & & 266 & & & & \\
\hline Queue Length 95th (ft) & & m\#917 & & & m205 & & & 365 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 253 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 737 & & & 1299 & & & 520 & & & & \\
\hline Starvation Cap Reductn & & 154 & & & 552 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 378 & & & 1 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.35 & & & 1.00 & & & 0.67 & & & & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6\%), Referenced to phase 6:, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 103.3 Intersection LOS: F
Intersection Capacity Utilization 77.1\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{lrrrrrrrrrrrrrr}
\hline & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}

4: Tremont Street \& Parker Street
p.m. Peak Hour
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & \(\rightarrow\) & \(\geqslant\) & 7 & \(\Perp\) & 4 & 4 & \(\dagger\) & \(p\) & \(\checkmark\) & \(\dagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & E & & & C & & & & & & F & \\
\hline Approach Delay & & 60.6 & & & 24.6 & & & & & & 155.5 & \\
\hline Approach LOS & & E & & & C & & & & & & F & \\
\hline Queue Length 50th (ft) & & 468 & & & 335 & & & & & & ~565 & \\
\hline Queue Length 95th (ft) & & 702 & & & 362 & & & & & & \#737 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 868 & & & 1579 & & & & & & 450 & \\
\hline Starvation Cap Reductn & & 0 & & & 643 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 183 & & & 0 & & & & & & 14 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.05 & & & 0.84 & & & & & & 1.20 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(43(31 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.16
Intersection Signal Delay: 71.1 Intersection LOS: E
Intersection Capacity Utilization 94.1\% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th \((\mathrm{ft})\) \\
Queue Length 95th ft ) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\downarrow\) & & \(\dagger\) & P & & \(\downarrow\) & & & & \\
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Lane Configurations & \({ }^{7}\) & 「 & 恌 & 「 & \％ & 个4 & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & \\
\hline Leading Detector（ft） & 50 & 50 & 50 & 50 & 50 & 50 & & & & \\
\hline Trailing Detector（ft） & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Turning Speed（mph） & 15 & 9 & & 9 & 15 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 0.91 & 1.00 & 1.00 & 0.95 & & & & \\
\hline Frt & & 0.850 & & 0.850 & & & & & & \\
\hline Flt Protected & 0.950 & & & & 0.950 & & & & & \\
\hline Satd．Flow（prot） & 1770 & 1583 & 5085 & 1583 & 1770 & 3539 & & & & \\
\hline Flt Permitted & 0.950 & & & & 0.950 & & & & & \\
\hline Satd．Flow（perm） & 1770 & 1583 & 5085 & 1583 & 1770 & 3539 & & & & \\
\hline Right Turn on Red & & Yes & & Yes & & & & & & \\
\hline Satd．Flow（RTOR） & & 46 & & 123 & & & & & & \\
\hline Headway Factor & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & & & & \\
\hline Link Speed（mph） & 30 & & 30 & & & 30 & & & & \\
\hline Link Distance（ft） & 597 & & 162 & & & 546 & & & & \\
\hline Travel Time（s） & 13.6 & & 3.7 & & & 12.4 & & & & \\
\hline Volume（vph） & 204 & 149 & 1465 & 113 & 147 & 1122 & & & & \\
\hline Peak Hour Factor & 0.92 & 0.92 & 0.92 & 0.92 & 0.92 & 0.92 & & & & \\
\hline Adj．Flow（vph） & 222 & 162 & 1592 & 123 & 160 & 1220 & & & & \\
\hline Lane Group Flow（vph） & 222 & 162 & 1592 & 123 & 160 & 1220 & & & & \\
\hline Turn Type & & custom & & custom & Prot & & & & & \\
\hline Protected Phases & 914 & 5 & 6 & 9 & 5 & 2 & 1 & 3 & 10 & 14 \\
\hline Permitted Phases & & 14 & & 6 & & & & & & \\
\hline Detector Phases & 914 & 5 & 6 & 9 & 5 & 2 & & & & \\
\hline Minimum Initial（s） & & 8.0 & 8.0 & 4.0 & 8.0 & 4.0 & 8.0 & 1.0 & 8.0 & 4.0 \\
\hline Minimum Split（s） & & 13.0 & 21.0 & 21.0 & 13.0 & 26.0 & 13.0 & 4.0 & 13.0 & 20.0 \\
\hline Total Split（s） & 94.0 & 24.0 & 52.0 & 34.0 & 24.0 & 60.0 & 16.0 & 4.0 & 26.0 & 60.0 \\
\hline Total Split（\％） & 67．1\％ & 17．1\％ & 37．1\％ & 24．3\％ & 17．1\％ & 42．9\％ & 11\％ & 3\％ & 19\％ & 43\％ \\
\hline Maximum Green（s） & & 19.0 & 47.0 & 29.0 & 19.0 & 55.0 & 11.0 & 2.0 & 21.0 & 56.0 \\
\hline Yellow Time（s） & & 3.0 & 3.0 & 4.0 & 3.0 & 4.0 & 3.0 & 2.0 & 3.0 & 3.5 \\
\hline All－Red Time（s） & & 2.0 & 2.0 & 1.0 & 2.0 & 1.0 & 2.0 & 0.0 & 2.0 & 0.5 \\
\hline Lead／Lag & & Lead & Lag & Lead & Lead & Lag & Lead & & Lag & \\
\hline Lead－Lag Optimize？ & & Yes & Yes & Yes & Yes & Yes & Yes & & Yes & \\
\hline Vehicle Extension（s） & & 3.0 & 3.0 & 3.0 & 3.0 & 2.0 & 2.0 & 3.0 & 2.0 & 3.0 \\
\hline Recall Mode & & None & C－Max & None & None & C－Max & None & None & None & None \\
\hline Walk Time（s） & & & 5.0 & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & 11.0 & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & 0 & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 56.0 & 77.4 & 54.6 & 83.8 & 17.4 & 60.0 & & & & \\
\hline Actuated g／C Ratio & 0.40 & 0.55 & 0.39 & 0.60 & 0.12 & 0.43 & & & & \\
\hline \(\mathrm{v} / \mathrm{c}\) Ratio & 0.31 & 0.18 & 0.80 & 0.12 & 0.73 & 0.80 & & & & \\
\hline Control Delay & 30.4 & 11.0 & 10.6 & 0.2 & 77.6 & 40.0 & & & & \\
\hline Queue Delay & 0.0 & 0.0 & 7.5 & 1.6 & 0.0 & 6.8 & & & & \\
\hline Total Delay & 30.4 & 11.0 & 18.1 & 1.8 & 77.6 & 46.8 & & & & \\
\hline LOS & C & B & B & A & E & D & & & & \\
\hline Approach Delay & 22.2 & & 16.9 & & & 50.4 & & & & \\
\hline Approach LOS & C & & B & & & D & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Queue Length 50th (ft) & 138 & 48 & 83 & 0 & 141 & 503 & & & & \\
\hline Queue Length 95th (ft) & 204 & 84 & m120 & m0 & 219 & 597 & & & & \\
\hline Internal Link Dist (ft) & 517 & & 82 & & & 466 & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & \\
\hline Base Capacity (vph) & 708 & 924 & 1982 & 1047 & 253 & 1517 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 359 & 778 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 257 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.31 & 0.18 & 0.98 & 0.46 & 0.63 & 0.97 & & & & \\
\hline
\end{tabular}

\section*{Intersection Summary}

\section*{Area Type: Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 7 (5\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 30.8 Intersection LOS: C
Intersection Capacity Utilization 57.8\% ICU Level of Service B
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street


\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & 4 & & & \(\downarrow\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(ø 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & M & & \({ }^{7}\) & 掚 & 性 & & & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width (ft) & 13 & 12 & 10 & 11 & 11 & 12 & & & & & \\
\hline Storage Length (ft) & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector (ft) & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector (ft) & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed (mph) & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.972 & & & & 0.972 & & & & & & \\
\hline Flt Protected & 0.962 & & 0.950 & & & & & & & & \\
\hline Satd. Flow (prot) & 1556 & 0 & 1472 & 4172 & 2543 & 0 & & & & & \\
\hline Flt Permitted & 0.962 & & 0.950 & & & & & & & & \\
\hline Satd. Flow (perm) & 1556 & 0 & 1472 & 4172 & 2543 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd. Flow (RTOR) & 8 & & & & 25 & & & & & & \\
\hline Headway Factor & 1.10 & 1.14 & 1.25 & 1.21 & 1.27 & 1.14 & & & & & \\
\hline Link Speed (mph) & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance (ft) & 984 & & & 811 & 161 & & & & & & \\
\hline Travel Time (s) & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume (vph) & 155 & 46 & 319 & 1657 & 793 & 168 & & & & & \\
\hline Peak Hour Factor & 0.74 & 0.84 & 0.77 & 0.92 & 0.85 & 0.78 & & & & & \\
\hline Heavy Vehicles (\%) & 7\% & 3\% & 3\% & 7\% & 15\% & 10\% & & & & & \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 8 & 0 & 8 & & & & & \\
\hline Parking (\#/hr) & & & & & 0 & 0 & & & & & \\
\hline Adj. Flow (vph) & 209 & 55 & 414 & 1801 & 933 & 215 & & & & & \\
\hline Lane Group Flow (vph) & 264 & 0 & 414 & 1801 & 1148 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline \multicolumn{12}{|l|}{Permitted Phases} \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial (s) & 8.0 & & 8.0 & 8.0 & & & 8.0 & 1.0 & 8.0 & 3.0 & 4.0 \\
\hline Minimum Split (s) & 13.0 & & 13.0 & 13.0 & & & 30.0 & 4.0 & 13.0 & 8.0 & 20.0 \\
\hline Total Split (s) & 29.0 & 0.0 & 37.0 & 64.0 & 69.0 & 0.0 & 52.0 & 5.0 & 25.0 & 17.0 & 46.0 \\
\hline Total Split (\%) & 20.7\% & 0.0\% & 26.4\% & 45.7\% & 49.3\% & 0.0\% & 37\% & 4\% & 18\% & 12\% & 33\% \\
\hline Maximum Green (s) & 24.0 & & 32.0 & 59.0 & & & 47.0 & 3.0 & 20.0 & 12.0 & 42.0 \\
\hline Yellow Time (s) & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All-Red Time (s) & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead/Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead-Lag Optimize? & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension (s) & 2.0 & & 2.0 & 2.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & Max & C-Max & & & C-Max & None & None & Max & None \\
\hline Walk Time (s) & & & & & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk (s) & & & & & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls (\#/hr) & & & & & & & 10 & & & & 0 \\
\hline Act Effct Green (s) & 24.5 & & 33.5 & 69.1 & 70.0 & & & & & & \\
\hline Actuated g/C Ratio & 0.18 & & 0.24 & 0.49 & 0.50 & & & & & & \\
\hline v/c Ratio & 0.95 & & 1.18 & 0.87 & 0.89 & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & \(\downarrow\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\emptyset 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\theta 14\) \\
\hline Control Delay & 96.8 & & 135.9 & 25.4 & 17.9 & & & & & & \\
\hline Queue Delay & 22.6 & & 0.0 & 0.3 & 33.4 & & & & & & \\
\hline Total Delay & 119.4 & & 135.9 & 25.7 & 51.3 & & & & & & \\
\hline LOS & F & & F & C & D & & & & & & \\
\hline Approach Delay & 119.4 & & & 46.3 & 51.3 & & & & & & \\
\hline Approach LOS & F & & & D & D & & & & & & \\
\hline Queue Length 50th (ft) & 233 & & \(\sim 436\) & 625 & 533 & & & & & & \\
\hline Queue Length 95th (ft) & \#285 & & m254 & m489 & 587 & & & & & & \\
\hline Internal Link Dist (ft) & 904 & & & 731 & 81 & & & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & \\
\hline Base Capacity (vph) & 284 & & 352 & 2059 & 1284 & & & & & & \\
\hline Starvation Cap Reductn & 0 & & 0 & 0 & 208 & & & & & & \\
\hline Spillback Cap Reductn & 28 & & 0 & 39 & 0 & & & & & & \\
\hline Storage Cap Reductn & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Reduced v/c Ratio & 1.03 & & 1.18 & 0.89 & 1.07 & & & & & & \\
\hline \multicolumn{12}{|l|}{Intersection Summary} \\
\hline \multicolumn{12}{|l|}{Area Type: CBD} \\
\hline \multicolumn{12}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Offset: 89 (64\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow} \\
\hline \multicolumn{12}{|l|}{Natural Cycle: 130} \\
\hline \multicolumn{12}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{12}{|l|}{Maximum v/c Ratio: 1.18} \\
\hline \multicolumn{5}{|l|}{Intersection Signal Delay: 53.2} & \multicolumn{7}{|l|}{Intersection LOS: D} \\
\hline \multicolumn{5}{|l|}{Intersection Capacity Utilization \(72.6 \%\)} & \multicolumn{7}{|l|}{ICU Level of Service C} \\
\hline \multicolumn{12}{|l|}{Analysis Period (min) 15} \\
\hline \multicolumn{12}{|l|}{~ Volume exceeds capacity, queue is theoretically infinite.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\# 95th percentile volume exceeds capacity, queue may be longer.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\(m\) Volume for 95th percentile queue is metered by upstream signal.} \\
\hline
\end{tabular}

Splits and Phases: 1: Prentiss Street \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & \(\hat{4}_{4}\) & & & * \(\uparrow\) & F' & & \% & 慛 & & & \({ }^{7}\) \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length (ft) & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util. Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.978 & & & & 0.850 & & & 0.992 & & & \\
\hline Flt Protected & & 0.978 & & & 0.994 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (prot) & 0 & 2691 & 0 & 0 & 2893 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Flt Permitted & & 0.580 & & & 0.643 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (perm) & 0 & 1596 & 0 & 0 & 1872 & 1286 & 0 & 1460 & 4257 & 0 & 0 & 1115 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline \multicolumn{13}{|l|}{Satd. Flow (RTOR)} \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance (ft) & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time (s) & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume (vph) & 265 & 259 & 79 & 57 & 415 & 464 & 3 & 163 & 1237 & 55 & 8 & 124 \\
\hline Peak Hour Factor & 0.85 & 0.93 & 0.76 & 0.86 & 0.89 & 0.87 & 0.38 & 0.87 & 0.85 & 0.70 & 0.67 & 0.86 \\
\hline Heavy Vehicles (\%) & 4\% & 8\% & 5\% & 16\% & 11\% & 13\% & 0\% & 4\% & 5\% & 8\% & 0\% & 39\% \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 16 & 0 & 0 \\
\hline Parking (\#/hr) & & 1 & 1 & & & & & & & & & \\
\hline Adj. Flow (vph) & 312 & 278 & 104 & 66 & 466 & 533 & 8 & 187 & 1455 & 79 & 12 & 144 \\
\hline Lane Group Flow (vph) & 0 & 694 & 0 & 0 & 532 & 533 & 0 & 195 & 1534 & 0 & 0 & 156 \\
\hline Turn Type & D.P+P & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial (s) & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split (s) & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split (s) & 15.0 & 43.0 & 0.0 & 28.0 & 28.0 & 0.0 & 19.0 & 19.0 & 40.0 & 0.0 & 19.0 & 19.0 \\
\hline Total Split (\%) & 10.7\% & 30.7\% & 0.0\% & 20.0\% & 20.0\% & 0.0\% & 13.6\% & 13.6\% & 28.6\% & 0.0\% & 13.6\% & 13.6\% \\
\hline Maximum Green (s) & 9.0 & & & 21.0 & 21.0 & & 13.0 & 13.0 & 34.0 & & 13.0 & 13.0 \\
\hline Yellow Time (s) & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All-Red Time (s) & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead/Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead-Lag Optimize? & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension (s) & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C-Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 35.0 & & & 24.0 & 140.0 & & 15.0 & 36.0 & & & 15.0 \\
\hline Actuated g/C Ratio & & 0.25 & & & 0.17 & 1.00 & & 0.11 & 0.26 & & & 0.11 \\
\hline v/c Ratio & & 2.12 dl & & & 1.66 & 0.41 & & 1.25 & 1.40 & & & 1.31 \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & \(\dagger\) & 4 & \(\dagger\) & \(p\) & 4 & * \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Control Delay & & 232.1 & & & 344.8 & 1.0 & & 203.8 & 224.7 & & & 201.3 \\
\hline Queue Delay & & 0.0 & & & 0.0 & 0.0 & & 0.0 & 0.0 & & & 0.0 \\
\hline Total Delay & & 232.1 & & & 344.8 & 1.0 & & 203.8 & 224.7 & & & 201.3 \\
\hline LOS & & F & & & F & A & & F & F & & & F \\
\hline Approach Delay & & 232.1 & & & 172.7 & & & & 222.4 & & & \\
\hline Approach LOS & & F & & & F & & & & F & & & \\
\hline Queue Length 50th (ft) & & \(\sim 444\) & & & ~369 & 0 & & ~221 & \(\sim 682\) & & & ~185 \\
\hline Queue Length 95th (ft) & & m\#183 & & & \#481 & 0 & & \#364 & \#716 & & & m\#220 \\
\hline Internal Link Dist (ft) & & 371 & & & 313 & & & & 369 & & & \\
\hline Turn Bay Length (ft) & & & & & & 200 & & 200 & & & & 200 \\
\hline Base Capacity (vph) & & 485 & & & 321 & 1286 & & 156 & 1095 & & & 119 \\
\hline Starvation Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Spillback Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Storage Cap Reductn & & 0 & & & 0 & 0 & & 0 & 0 & & & 0 \\
\hline Reduced v/c Ratio & & 1.43 & & & 1.66 & 0.41 & & 1.25 & 1.40 & & & 1.31 \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline \multicolumn{13}{|l|}{Area Type: CBD} \\
\hline \multicolumn{13}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{13}{|l|}{Offset: 9 (6\%), Referenced to phase 1:NBSB, Start of Green} \\
\hline \multicolumn{13}{|l|}{Natural Cycle: 145} \\
\hline \multicolumn{13}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{13}{|l|}{Maximum v/c Ratio: 1.66} \\
\hline
\end{tabular}

Intersection Signal Delay: \(184.2 \quad\) Intersection LOS: F
Intersection Capacity Utilization 83.3\% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
dl Defacto Left Lane. Recode with 1 though lane as a left lane.
Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard


\begin{tabular}{lrr} 
Lane Group & SBT & SBR \(\quad ø 2\) \\
\hline Control Delay & 68.8 & \\
Queue Delay & 0.0 & \\
Total Delay & 68.8 & \\
LOS & E & \\
Approach Delay & 91.0 & F \\
Approach LOS & 275 & \\
Queue Length 50th (ft) & \\
Queue Length 95th (ft) & m307 & \\
Internal Link Dist (ft) & 731 & \\
Turn Bay Length (ft) & & \\
Base Capacity (vph) & 1072 & \\
Starvation Cap Reductn & 0 \\
Spillback Cap Reductn & 0 & \\
Storage Cap Reductn & 0 & \\
Reduced v/c Ratio & 0.72 & \\
Intersection Summary & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & 4 & & & & \(\dagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \(\mathrm{A}_{4}\) & & & ¢ & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.92 & & & 0.93 & & & 0.94 & & & & \\
\hline Frt & & 0.986 & & & 0.981 & & & 0.983 & & & & \\
\hline Flt Protected & & 0.997 & & & 0.997 & & & 0.985 & & & & \\
\hline Satd. Flow (prot) & 0 & 1275 & 0 & 0 & 2525 & 0 & 0 & 1585 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.811 & & & 0.818 & & & 0.985 & & & & \\
\hline Satd. Flow (perm) & 0 & 1037 & 0 & 0 & 2071 & 0 & 0 & 1533 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 6 & & & 17 & & & 6 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 561 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 12.8 & \\
\hline Volume (vph) & 21 & 560 & 63 & 31 & 672 & 86 & 131 & 258 & 44 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.38 & 0.84 & 0.76 & 0.58 & 0.90 & 0.75 & 0.92 & 0.92 & 0.73 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 6\% & 0\% & 3\% & 7\% & 7\% & 2\% & 0\% & 5\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 55 & 667 & 83 & 53 & 747 & 115 & 142 & 280 & 60 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 805 & 0 & 0 & 915 & 0 & 0 & 482 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 78.0 & 78.0 & 0.0 & 78.0 & 78.0 & 0.0 & 62.0 & 62.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 55.7\% & 55.7\% & 0.0\% & 55.7\% & 55.7\% & 0.0\% & 44.3\% & 44.3\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 73.0 & 73.0 & & 73.0 & 73.0 & & 57.0 & 57.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 74.0 & & & 74.0 & & & 58.0 & & & & \\
\hline Actuated g/C Ratio & & 0.53 & & & 0.53 & & & 0.41 & & & & \\
\hline v/c Ratio & & 1.46 & & & 0.83 & & & 0.75 & & & & \\
\hline Control Delay & & 240.1 & & & 24.0 & & & 43.5 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{\rightarrow}{ } \rightarrow\) & & 7 & \(\leftrightarrow\) & & 4 & \(\dagger\) & \(p\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & 77.1 & & & 6.0 & & & 0.0 & & & & \\
\hline Total Delay & 317.2 & & & 30.0 & & & 43.5 & & & & \\
\hline LOS & F & & & C & & & D & & & & \\
\hline Approach Delay & 317.2 & & & 30.0 & & & 43.5 & & & & \\
\hline Approach LOS & F & & & C & & & D & & & & \\
\hline Queue Length 50th (ft) & ~1002 & & & 144 & & & 366 & & & & \\
\hline Queue Length 95th (ft) & m\#1045 & & & m96 & & & 513 & & & & \\
\hline Internal Link Dist (ft) & 190 & & & 371 & & & 235 & & & 481 & \\
\hline \multicolumn{12}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & 551 & & & 1103 & & & 639 & & & & \\
\hline Starvation Cap Reductn & 58 & & & 144 & & & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & & & 12 & & & 0 & & & & \\
\hline Storage Cap Reductn & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & 1.63 & & & 0.95 & & & 0.75 & & & & \\
\hline \multicolumn{12}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 80 ( \(57 \%\) ), Referenced to phase 6:, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.46
Intersection Signal Delay: \(138.0 \quad\) Intersection LOS: F
Intersection Capacity Utilization 90.2\% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & & & & & 4 & \(\dagger\) & & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & ¢ & & & \(\uparrow{ }^{+}\) & & & & & & ¢ & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 9 & 9 & 9 & 14 & 14 & 14 & 12 & 12 & 12 & 10 & 10 & 10 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & & & & 50 & 50 & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & & & & 0 & 0 & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Frt & & 0.983 & & & 0.950 & & & & & & 0.989 & \\
\hline Flt Protected & & 0.994 & & & 0.996 & & & & & & 0.976 & \\
\hline Satd. Flow (prot) & 0 & 1407 & 0 & 0 & 3043 & 0 & 0 & 0 & 0 & 0 & 1445 & 0 \\
\hline Flt Permitted & & 0.694 & & & 0.817 & & & & & & 0.976 & \\
\hline Satd. Flow (perm) & 0 & 982 & 0 & 0 & 2496 & 0 & 0 & 0 & 0 & 0 & 1445 & 0 \\
\hline Right Turn on Red & & & No & & & No & & & No & & & No \\
\hline \multicolumn{13}{|l|}{Satd. Flow (RTOR)} \\
\hline Headway Factor & 1.30 & 1.30 & 1.30 & 1.05 & 1.05 & 1.05 & 1.14 & 1.14 & 1.14 & 1.25 & 1.25 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 555 & & & 270 & & & 349 & & & 585 & \\
\hline Travel Time (s) & & 12.6 & & & 6.1 & & & 7.9 & & & 13.3 & \\
\hline Volume (vph) & 58 & 491 & 53 & 58 & 493 & 252 & 0 & 0 & 0 & 153 & 134 & 24 \\
\hline Peak Hour Factor & 0.72 & 0.96 & 0.64 & 0.95 & 0.96 & 0.88 & 0.92 & 0.92 & 0.92 & 0.91 & 0.91 & 0.83 \\
\hline Heavy Vehicles (\%) & 5\% & 8\% & 2\% & 12\% & 11\% & 1\% & 2\% & 2\% & 2\% & 4\% & 7\% & 20\% \\
\hline Parking (\#/hr) & & & 0 & & & 0 & & & & & & 0 \\
\hline Adj. Flow (vph) & 81 & 511 & 83 & 61 & 514 & 286 & 0 & 0 & 0 & 168 & 147 & 29 \\
\hline Lane Group Flow (vph) & 0 & 675 & 0 & 0 & 861 & 0 & 0 & 0 & 0 & 0 & 344 & 0 \\
\hline Turn Type & Perm & & & Perm & & & & & & Split & & \\
\hline Protected Phases & & 1 & & & 1 & & & & & 9 & 9 & \\
\hline Permitted Phases & 1 & & & 1 & & & & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & & & & 9 & 9 & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & & & & 8.0 & 8.0 & \\
\hline Minimum Split (s) & 12.0 & 12.0 & & 12.0 & 12.0 & & & & & 12.0 & 12.0 & \\
\hline Total Split (s) & 77.0 & 77.0 & 0.0 & 77.0 & 77.0 & 0.0 & 0.0 & 0.0 & 0.0 & 39.0 & 39.0 & 0.0 \\
\hline Total Split (\%) & 55.0\% & 55.0\% & 0.0\% & 55.0\% & 55.0\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% & 27.9\% & 27.9\% & 0.0\% \\
\hline Maximum Green (s) & 73.0 & 73.0 & & 73.0 & 73.0 & & & & & 35.0 & 35.0 & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & & & & 3.0 & 3.0 & \\
\hline All-Red Time (s) & 1.0 & 1.0 & & 1.0 & 1.0 & & & & & 1.0 & 1.0 & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & & & & 2.0 & 2.0 & \\
\hline Recall Mode & C-Max & C-Max & & C-Max & C-Max & & & & & None & None & \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 97.7 & & & 97.7 & & & & & & 34.3 & \\
\hline Actuated g/C Ratio & & 0.70 & & & 0.70 & & & & & & 0.24 & \\
\hline v/c Ratio & & 0.99 & & & 0.49 & & & & & & 0.97 & \\
\hline Control Delay & & 52.7 & & & 4.0 & & & & & & 93.7 & \\
\hline Queue Delay & & 83.9 & & & 2.2 & & & & & & 658.1 & \\
\hline Total Delay & & 136.6 & & & 6.3 & & & & & & 751.8 & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & 7 & & 4 & 4 & \(\dagger\) & \(p\) & , & \(\ddagger\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & F & & & A & & & & & & F & \\
\hline Approach Delay & & 136.6 & & & 6.3 & & & & & & 751.8 & \\
\hline Approach LOS & & F & & & A & & & & & & F & \\
\hline Queue Length 50th (ft) & & 556 & & & 65 & & & & & & 310 & \\
\hline Queue Length 95th (ft) & & \#875 & & & 103 & & & & & & \#507 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 685 & & & 1742 & & & & & & 361 & \\
\hline Starvation Cap Reductn & & 0 & & & 710 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 127 & & & 0 & & & & & & 360 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.21 & & & 0.83 & & & & & & 344.00 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}
```

Area Type:
CBD

```

Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(90(64 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 189.5 Intersection LOS: F
Intersection Capacity Utilization 90.7\% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th \((\mathrm{ft})\) \\
Queue Length 95th ft ) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\dagger\) & \[
4
\] & \(\uparrow\) & 1 & & \(\downarrow\) & & & & \\
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(ø 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Approach LOS & C & & A & & & D & & & & \\
\hline Queue Length 50th (ft) & 34 & 0 & 69 & 10 & 125 & 390 & & & & \\
\hline Queue Length 95th (ft) & 68 & 24 & m105 & m5 & 196 & 470 & & & & \\
\hline Internal Link Dist (ft) & 506 & & 81 & & & 465 & & & & \\
\hline \multicolumn{11}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & 531 & 779 & 2509 & 857 & 248 & 1340 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 583 & 612 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 159 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.10 & 0.07 & 0.93 & 0.69 & 0.57 & 0.81 & & & & \\
\hline Intersection Summary & & & & & & & & & & \\
\hline
\end{tabular}

\section*{Area Type: \\ Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 89 (64\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.18
Intersection Signal Delay: 22.5 Intersection LOS: C
Intersection Capacity Utilization 52.5\% ICU Level of Service A
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & 7 & & \(\dagger\) & & & \(\dagger\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 12 & 125 & 381 & 0 & 0 & 263 & \\
\hline Peak Hour Factor & 0.50 & 0.85 & 0.92 & 0.25 & 0.92 & 0.97 & \\
\hline Hourly flow rate (vph) & 24 & 147 & 414 & 0 & 0 & 271 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed ( \(\mathrm{ft} / \mathrm{s}\) ) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 685 & 414 & & & 414 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu , unblocked vol & 685 & 414 & & & 414 & & \\
\hline tC, single (s) & 6.4 & 6.3 & & & 4.1 & & \\
\hline tC, 2 stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.4 & & & 2.2 & & \\
\hline p0 queue free \% & 94 & 76 & & & 100 & & \\
\hline cM capacity (veh/h) & 417 & 625 & & & 1156 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 171 & 414 & 271 & & & & \\
\hline Volume Left & 24 & 0 & 0 & & & & \\
\hline Volume Right & 147 & 0 & 0 & & & & \\
\hline cSH & 584 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.29 & 0.24 & 0.16 & & & & \\
\hline Queue Length 95th (ft) & 30 & 0 & 0 & & & & \\
\hline Control Delay (s) & 13.7 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 13.7 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 2.7 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 38.3\% & & ICU Level & of Service & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & 4 & & \(\downarrow\) & & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(ø 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\varnothing 14\) \\
\hline Lane Configurations & ＊ & & \％ & 坐乐 & 性 & & & & & & \\
\hline Ideal Flow（vphpl） & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & & & & & \\
\hline Lane Width（ft） & 14 & 14 & 11 & 11 & 11 & 11 & & & & & \\
\hline Storage Length（ft） & 0 & 0 & 0 & & & 20 & & & & & \\
\hline Storage Lanes & 1 & 0 & 1 & & & 0 & & & & & \\
\hline Total Lost Time（s） & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & & & & & \\
\hline Leading Detector（ft） & 50 & & 50 & 50 & 50 & & & & & & \\
\hline Trailing Detector（ft） & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Turning Speed（mph） & 15 & 9 & 15 & & & 9 & & & & & \\
\hline Lane Util．Factor & 1.00 & 1.00 & 1.00 & 0.91 & 0.95 & 0.95 & & & & & \\
\hline Frt & 0.942 & & & & 0.989 & & & & & & \\
\hline Flt Protected & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（prot） & 1576 & 0 & 1540 & 4258 & 2808 & 0 & & & & & \\
\hline Flt Permitted & 0.972 & & 0.950 & & & & & & & & \\
\hline Satd．Flow（perm） & 1576 & 0 & 1540 & 4258 & 2808 & 0 & & & & & \\
\hline Right Turn on Red & & Yes & & & & Yes & & & & & \\
\hline Satd．Flow（RTOR） & 23 & & & & 11 & & & & & & \\
\hline Headway Factor & 1.05 & 1.05 & 1.19 & 1.21 & 1.27 & 1.19 & & & & & \\
\hline Link Speed（mph） & 30 & & & 30 & 30 & & & & & & \\
\hline Link Distance（ft） & 984 & & & 811 & 162 & & & & & & \\
\hline Travel Time（s） & 22.4 & & & 18.4 & 3.7 & & & & & & \\
\hline Volume（vph） & 199 & 149 & 127 & 1392 & 1245 & 91 & & & & & \\
\hline Peak Hour Factor & 0.87 & 0.85 & 0.82 & 0.96 & 0.92 & 0.82 & & & & & \\
\hline Heavy Vehicles（\％） & 9\％ & 2\％ & 2\％ & 5\％ & 5\％ & 6\％ & & & & & \\
\hline Bus Blockages（\＃／hr） & 0 & 0 & 0 & 7 & 0 & 7 & & & & & \\
\hline Parking（\＃／hr） & & & & & 0 & 0 & & & & & \\
\hline Adj．Flow（vph） & 229 & 175 & 155 & 1450 & 1353 & 111 & & & & & \\
\hline Lane Group Flow（vph） & 404 & 0 & 155 & 1450 & 1464 & 0 & & & & & \\
\hline Turn Type & & & Prot & & & & & & & & \\
\hline Protected Phases & 10 & & 1 & 6 & 29 & & 2 & 3 & 5 & 9 & 14 \\
\hline \multicolumn{12}{|l|}{Permitted Phases} \\
\hline Detector Phases & 10 & & 1 & 6 & 29 & & & & & & \\
\hline Minimum Initial（s） & 8.0 & & 8.0 & 8.0 & & & 4.0 & 1.0 & 8.0 & 4.0 & 4.0 \\
\hline Minimum Split（s） & 13.0 & & 13.0 & 21.0 & & & 26.0 & 4.0 & 13.0 & 21.0 & 20.0 \\
\hline Total Split（s） & 26.0 & 0.0 & 16.0 & 52.0 & 94.0 & 0.0 & 60.0 & 4.0 & 24.0 & 34.0 & 60.0 \\
\hline Total Split（\％） & 18．6\％ & 0．0\％ & 11．4\％ & 37．1\％ & 67．1\％ & 0．0\％ & 43\％ & 3\％ & 17\％ & 24\％ & 43\％ \\
\hline Maximum Green（s） & 21.0 & & 11.0 & 47.0 & & & 55.0 & 2.0 & 19.0 & 29.0 & 56.0 \\
\hline Yellow Time（s） & 3.0 & & 3.0 & 3.0 & & & 4.0 & 2.0 & 3.0 & 4.0 & 3.5 \\
\hline All－Red Time（s） & 2.0 & & 2.0 & 2.0 & & & 1.0 & 0.0 & 2.0 & 1.0 & 0.5 \\
\hline Lead／Lag & Lag & & Lead & Lag & & & Lag & & Lead & Lead & \\
\hline Lead－Lag Optimize？ & Yes & & Yes & Yes & & & Yes & & Yes & Yes & \\
\hline Vehicle Extension（s） & 2.0 & & 2.0 & 3.0 & & & 2.0 & 3.0 & 3.0 & 3.0 & 3.0 \\
\hline Recall Mode & None & & None & C－Max & & & C－Max & None & None & None & None \\
\hline Walk Time（s） & & & & 5.0 & & & 7.0 & & & & 5.0 \\
\hline Flash Dont Walk（s） & & & & 11.0 & & & 14.0 & & & & 11.0 \\
\hline Pedestrian Calls（\＃／hr） & & & & 0 & & & 10 & & & & 0 \\
\hline Act Effct Green（s） & 26.7 & & 12.0 & 54.6 & 89.3 & & & & & & \\
\hline Actuated g／C Ratio & 0.19 & & 0.09 & 0.39 & 0.64 & & & & & & \\
\hline v／c Ratio & 1.27 & & 1.17 & 0.87 & 0.82 & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & & & 4 & & & \(\checkmark\) & & & & & \\
\hline Lane Group & EBL & EBR & NBL & NBT & SBT & SBR & \(\emptyset 2\) & \(\varnothing 3\) & \(\varnothing 5\) & \(\varnothing 9\) & \(\theta 14\) \\
\hline Control Delay & 184.9 & & 140.6 & 59.1 & 9.2 & & & & & & \\
\hline Queue Delay & 73.4 & & 0.0 & 0.9 & 5.7 & & & & & & \\
\hline Total Delay & 258.2 & & 140.6 & 60.1 & 14.9 & & & & & & \\
\hline LOS & F & & F & E & B & & & & & & \\
\hline Approach Delay & 258.2 & & & 67.8 & 14.9 & & & & & & \\
\hline Approach LOS & F & & & E & B & & & & & & \\
\hline Queue Length 50th (ft) & \(\sim 445\) & & ~173 & 496 & 158 & & & & & & \\
\hline Queue Length 95th (ft) & \#676 & & m\#165 & m447 & 122 & & & & & & \\
\hline Internal Link Dist (ft) & 904 & & & 731 & 82 & & & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & & \\
\hline Base Capacity (vph) & 319 & & 132 & 1660 & 1889 & & & & & & \\
\hline Starvation Cap Reductn & 0 & & 0 & 0 & 369 & & & & & & \\
\hline Spillback Cap Reductn & 37 & & 0 & 62 & 0 & & & & & & \\
\hline Storage Cap Reductn & 0 & & 0 & 0 & 0 & & & & & & \\
\hline Reduced v/c Ratio & 1.43 & & 1.17 & 0.91 & 0.96 & & & & & & \\
\hline \multicolumn{12}{|l|}{Intersection Summary} \\
\hline \multicolumn{12}{|l|}{Area Type: CBD} \\
\hline \multicolumn{12}{|l|}{Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Actuated Cycle Length: 140} \\
\hline \multicolumn{12}{|l|}{Offset: \(7(5 \%\) ), Referenced to phase 2:SBT and 6:NBT, Start of Yellow} \\
\hline \multicolumn{12}{|l|}{Natural Cycle: 130} \\
\hline \multicolumn{12}{|l|}{Control Type: Actuated-Coordinated} \\
\hline \multicolumn{12}{|l|}{Maximum v/c Ratio: 1.27} \\
\hline \multicolumn{5}{|l|}{Intersection Signal Delay: 67.7} & \multicolumn{7}{|l|}{Intersection LOS: E} \\
\hline \multicolumn{5}{|l|}{Intersection Capacity Utilization 81.7\%} & \multicolumn{7}{|l|}{ICU Level of Service D} \\
\hline \multicolumn{12}{|l|}{Analysis Period (min) 15} \\
\hline \multicolumn{12}{|l|}{~ Volume exceeds capacity, queue is theoretically infinite.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\# 95th percentile volume exceeds capacity, queue may be longer.} \\
\hline \multicolumn{12}{|l|}{Queue shown is maximum after two cycles.} \\
\hline \multicolumn{12}{|l|}{\(m\) Volume for 95th percentile queue is metered by upstream signal.} \\
\hline
\end{tabular}

Splits and Phases: 1: Prentiss Street \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\rangle\) & & & & & & \(\dagger\) & 4 & \(\dagger\) & + & 4 & \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBU & NBL & NBT & NBR & SBU & SBL \\
\hline Lane Configurations & & * \({ }^{\text {a }}\) & & & \(\uparrow \uparrow\) & F & & \% & 惺耍 & & & 7 \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 12 & 12 & 12 & 11 & 10 & 11 & 12 & 12 & 10 \\
\hline Storage Length (ft) & 0 & & 0 & 0 & & 200 & & 200 & & 0 & & 200 \\
\hline Storage Lanes & 0 & & 0 & 0 & & 1 & & 1 & & 0 & & 1 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & 50 & 50 & 50 & 50 & & 50 & 50 \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & 0 & 0 & 0 & 0 & & 0 & 0 \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 9 & 15 & & 9 & 9 & 15 \\
\hline Lane Util. Factor & 0.95 & 0.95 & 0.95 & 0.95 & 0.95 & 1.00 & 0.91 & 1.00 & 0.91 & 0.91 & 0.91 & 1.00 \\
\hline Frt & & 0.964 & & & & 0.850 & & & 0.986 & & & \\
\hline Flt Protected & & 0.985 & & & 0.991 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (prot) & 0 & 2735 & 0 & 0 & 3126 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1232 \\
\hline Flt Permitted & & 0.553 & & & 0.542 & & & 0.950 & & & & 0.950 \\
\hline Satd. Flow (perm) & 0 & 1535 & 0 & 0 & 1710 & 1264 & 0 & 1473 & 4282 & 0 & 0 & 1232 \\
\hline Right Turn on Red & & & No & & & No & & & & No & & \\
\hline Satd. Flow (RTOR) & & & & & & & & & & & & \\
\hline Headway Factor & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.19 & 1.25 & 1.19 & 1.14 & 1.14 & 1.25 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & & 30 & & & \\
\hline Link Distance (ft) & & 451 & & & 393 & & & & 449 & & & \\
\hline Travel Time (s) & & 10.3 & & & 8.9 & & & & 10.2 & & & \\
\hline Volume (vph) & 189 & 323 & 150 & 63 & 298 & 341 & 1 & 137 & 991 & 98 & 3 & 175 \\
\hline Peak Hour Factor & 0.83 & 0.92 & 0.83 & 0.83 & 0.89 & 0.82 & 0.25 & 0.89 & 0.86 & 0.85 & 0.38 & 0.89 \\
\hline Heavy Vehicles (\%) & 1\% & 5\% & 3\% & 3\% & 3\% & 15\% & 0\% & 3\% & 4\% & 3\% & 0\% & 24\% \\
\hline Bus Blockages (\#/hr) & 0 & 0 & 0 & 0 & 0 & - & - & 0 & 0 & 16 & 0 & 0 \\
\hline Parking (\#/hr) & & 1 & 1 & & & & & & & & & \\
\hline Adj. Flow (vph) & 228 & 351 & 181 & 76 & 335 & 416 & 4 & 154 & 1152 & 115 & 8 & 197 \\
\hline Lane Group Flow (vph) & 0 & 760 & 0 & 0 & 411 & 416 & 0 & 158 & 1267 & 0 & 0 & 205 \\
\hline Turn Type & D.P + + & & & Perm & & Free & Prot & Prot & & & Prot & Prot \\
\hline Protected Phases & 3 & 34 & & & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Permitted Phases & 4 & & & 4 & & Free & & & & & & \\
\hline Detector Phases & 3 & 34 & & 4 & 4 & & 9 & 9 & 1 & & 9 & 9 \\
\hline Minimum Initial (s) & 8.0 & & & 8.0 & 8.0 & & 8.0 & 8.0 & 8.0 & & 8.0 & 8.0 \\
\hline Minimum Split (s) & 14.0 & & & 15.0 & 15.0 & & 14.0 & 14.0 & 14.0 & & 14.0 & 14.0 \\
\hline Total Split (s) & 15.0 & 40.0 & 0.0 & 25.0 & 25.0 & 0.0 & 20.0 & 20.0 & 42.0 & 0.0 & 20.0 & 20.0 \\
\hline Total Split (\%) & 10.7\% & 28.6\% & 0.0\% & 17.9\% & 17.9\% & 0.0\% & 14.3\% & 14.3\% & 30.0\% & 0.0\% & 14.3\% & 14.3\% \\
\hline Maximum Green (s) & 9.0 & & & 18.0 & 18.0 & & 14.0 & 14.0 & 36.0 & & 14.0 & 14.0 \\
\hline Yellow Time (s) & 3.0 & & & 3.0 & 3.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline All-Red Time (s) & 3.0 & & & 4.0 & 4.0 & & 3.0 & 3.0 & 3.0 & & 3.0 & 3.0 \\
\hline Lead/Lag & Lead & & & Lag & Lag & & & & Lead & & & \\
\hline Lead-Lag Optimize? & Yes & & & Yes & Yes & & & & Yes & & & \\
\hline Vehicle Extension (s) & 2.0 & & & 2.0 & 2.0 & & 2.0 & 2.0 & 2.0 & & 2.0 & 2.0 \\
\hline Recall Mode & None & & & None & None & & None & None & C-Max & & None & None \\
\hline \multicolumn{13}{|l|}{Walk Time (s)} \\
\hline \multicolumn{13}{|l|}{Flash Dont Walk (s)} \\
\hline \multicolumn{13}{|l|}{Pedestrian Calls (\#/hr)} \\
\hline Act Effct Green (s) & & 32.0 & & & 21.0 & 140.0 & & 16.0 & 38.0 & & & 16.0 \\
\hline Actuated g/C Ratio & & 0.23 & & & 0.15 & 1.00 & & 0.11 & 0.27 & & & 0.11 \\
\hline v/c Ratio & & 1.71 & & & 1.60 & 0.33 & & 0.94 & 1.09 & & & 1.45 \\
\hline
\end{tabular}



Splits and Phases: 2: Tremont Street \& Malcolm X Boulevard


\begin{tabular}{|c|c|c|c|}
\hline Lane Group & SBT & SBR & \(\varnothing 2\) \\
\hline Control Delay & 80.5 & & \\
\hline Queue Delay & 33.8 & & \\
\hline Total Delay & 114.3 & & \\
\hline LOS & F & & \\
\hline Approach Delay & 134.6 & & \\
\hline Approach LOS & F & & \\
\hline Queue Length 50th (ft) & \(\sim 490\) & & \\
\hline Queue Length 95th (ft) & m\#551 & & \\
\hline Internal Link Dist (ft) & 731 & & \\
\hline Turn Bay Length (ft) & & & \\
\hline Base Capacity (vph) & 1202 & & \\
\hline Starvation Cap Reductn & 0 & & \\
\hline Spillback Cap Reductn & 81 & & \\
\hline Storage Cap Reductn & 0 & & \\
\hline Reduced v/c Ratio & 1.17 & & \\
\hline \multicolumn{4}{|l|}{Intersection Summary} \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & 4 & & & & & & 4 & \(\dagger\) & & - & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Lane Configurations & & \(\dagger\) & & & \({ }^{\text {AT }}\) & & & \(\dagger\) & & & & \\
\hline Ideal Flow (vphpl) & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 & 1900 \\
\hline Lane Width (ft) & 11 & 11 & 11 & 11 & 11 & 11 & 12 & 12 & 12 & 12 & 12 & 12 \\
\hline Total Lost Time (s) & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 & 4.0 \\
\hline Leading Detector (ft) & 50 & 50 & & 50 & 50 & & 50 & 50 & & & & \\
\hline Trailing Detector (ft) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Turning Speed (mph) & 15 & & 9 & 15 & & 9 & 15 & & 9 & 15 & & 9 \\
\hline Lane Util. Factor & 1.00 & 1.00 & 1.00 & 0.95 & 0.95 & 0.95 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 & 1.00 \\
\hline Ped Bike Factor & & 0.89 & & & 0.94 & & & 0.93 & & & & \\
\hline Frt & & 0.982 & & & 0.983 & & & 0.981 & & & & \\
\hline Flt Protected & & 0.998 & & & 0.996 & & & 0.985 & & & & \\
\hline Satd. Flow (prot) & 0 & 1264 & 0 & 0 & 2632 & 0 & 0 & 1564 & 0 & 0 & 0 & 0 \\
\hline Flt Permitted & & 0.948 & & & 0.811 & & & 0.985 & & & & \\
\hline Satd. Flow (perm) & 0 & 1201 & 0 & 0 & 2143 & 0 & 0 & 1509 & 0 & 0 & 0 & 0 \\
\hline Right Turn on Red & & & Yes & & & Yes & & & Yes & & & Yes \\
\hline Satd. Flow (RTOR) & & 10 & & & 17 & & & 6 & & & & \\
\hline Headway Factor & 1.19 & 1.36 & 1.19 & 1.19 & 1.28 & 1.19 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 & 1.14 \\
\hline Link Speed (mph) & & 30 & & & 30 & & & 30 & & & 30 & \\
\hline Link Distance (ft) & & 270 & & & 451 & & & 315 & & & 333 & \\
\hline Travel Time (s) & & 6.1 & & & 10.3 & & & 7.2 & & & 7.6 & \\
\hline Volume (vph) & 13 & 617 & 86 & 39 & 538 & 68 & 101 & 168 & 42 & 0 & 0 & 0 \\
\hline Confl. Peds. (\#/hr) & 91 & & 240 & 240 & & 91 & 40 & & 87 & & & \\
\hline Peak Hour Factor & 0.40 & 0.94 & 0.80 & 0.68 & 0.88 & 0.82 & 0.91 & 0.87 & 0.85 & 0.92 & 0.92 & 0.92 \\
\hline Heavy Vehicles (\%) & 0\% & 3\% & 0\% & 3\% & 4\% & 0\% & 2\% & 2\% & 2\% & 2\% & 2\% & 2\% \\
\hline Parking (\#/hr) & & 0 & 0 & & 2 & 2 & & & & & & \\
\hline Adj. Flow (vph) & 32 & 656 & 108 & 57 & 611 & 83 & 111 & 193 & 49 & 0 & 0 & 0 \\
\hline Lane Group Flow (vph) & 0 & 796 & 0 & 0 & 751 & 0 & 0 & 353 & 0 & 0 & 0 & 0 \\
\hline Turn Type & Perm & & & Perm & & & Perm & & & & & \\
\hline Protected Phases & & 1 & & & 1 & & & 5 & & & & \\
\hline Permitted Phases & 1 & & & 1 & & & 5 & & & & & \\
\hline Detector Phases & 1 & 1 & & 1 & 1 & & 5 & 5 & & & & \\
\hline Minimum Initial (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Minimum Split (s) & 20.0 & 20.0 & & 20.0 & 20.0 & & 20.0 & 20.0 & & & & \\
\hline Total Split (s) & 88.0 & 88.0 & 0.0 & 88.0 & 88.0 & 0.0 & 52.0 & 52.0 & 0.0 & 0.0 & 0.0 & 0.0 \\
\hline Total Split (\%) & 62.9\% & 62.9\% & 0.0\% & 62.9\% & 62.9\% & 0.0\% & 37.1\% & 37.1\% & 0.0\% & 0.0\% & 0.0\% & 0.0\% \\
\hline Maximum Green (s) & 83.0 & 83.0 & & 83.0 & 83.0 & & 47.0 & 47.0 & & & & \\
\hline Yellow Time (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline All-Red Time (s) & 2.0 & 2.0 & & 2.0 & 2.0 & & 2.0 & 2.0 & & & & \\
\hline \multicolumn{13}{|l|}{Lead/Lag} \\
\hline \multicolumn{13}{|l|}{Lead-Lag Optimize?} \\
\hline Vehicle Extension (s) & 3.0 & 3.0 & & 3.0 & 3.0 & & 3.0 & 3.0 & & & & \\
\hline Recall Mode & Max & Max & & Max & Max & & None & None & & & & \\
\hline Walk Time (s) & 8.0 & 8.0 & & 8.0 & 8.0 & & 8.0 & 8.0 & & & & \\
\hline Flash Dont Walk (s) & 0.0 & 0.0 & & 0.0 & 0.0 & & 7.0 & 7.0 & & & & \\
\hline Pedestrian Calls (\#/hr) & 0 & 0 & & 0 & 0 & & 0 & 0 & & & & \\
\hline Act Effct Green (s) & & 84.0 & & & 84.0 & & & 48.0 & & & & \\
\hline Actuated g/C Ratio & & 0.60 & & & 0.60 & & & 0.34 & & & & \\
\hline \(\mathrm{v} / \mathrm{c}\) Ratio & & 1.10 & & & 0.58 & & & 0.68 & & & & \\
\hline Control Delay & & 76.9 & & & 25.5 & & & 46.4 & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\stackrel{ }{*}\) & & & & & & 4 & \(\dagger\) & 7 & \(\checkmark\) & \(\downarrow\) & \(\checkmark\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline Queue Delay & & 116.6 & & & 19.1 & & & 0.0 & & & & \\
\hline Total Delay & & 193.4 & & & 44.6 & & & 46.4 & & & & \\
\hline LOS & & F & & & D & & & D & & & & \\
\hline Approach Delay & & 193.4 & & & 44.6 & & & 46.4 & & & & \\
\hline Approach LOS & & F & & & D & & & D & & & & \\
\hline Queue Length 50th (ft) & & ~810 & & & 337 & & & 270 & & & & \\
\hline Queue Length 95th (ft) & & m\#931 & & & m206 & & & 370 & & & & \\
\hline Internal Link Dist (ft) & & 190 & & & 371 & & & 235 & & & 253 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 725 & & & 1293 & & & 521 & & & & \\
\hline Starvation Cap Reductn & & 142 & & & 547 & & & 0 & & & & \\
\hline Spillback Cap Reductn & & 0 & & & 373 & & & 1 & & & & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & 0 & & & & \\
\hline Reduced v/c Ratio & & 1.37 & & & 1.01 & & & 0.68 & & & & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

\section*{Area Type: CBD}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6\%), Referenced to phase 6:, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.10
Intersection Signal Delay: 107.3 Intersection LOS: F
Intersection Capacity Utilization 80.9\% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 3: Tremont Street \& Gurney Street

\begin{tabular}{lrrrrrrrrrrrrrr}
\hline & & & & & & & & & & & & & & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|}
\hline Lane Group & \(\varnothing 4\) \\
\hline Lane Configurations & \\
\hline Ideal Flow (vphpl) & \\
\hline Lane Width (ft) & \\
\hline Total Lost Time (s) & \\
\hline Leading Detector (ft) & \\
\hline Trailing Detector (ft) & \\
\hline Turning Speed (mph) & \\
\hline Lane Util. Factor & \\
\hline Frt & \\
\hline Flt Protected & \\
\hline Satd. Flow (prot) & \\
\hline Flt Permitted & \\
\hline Satd. Flow (perm) & \\
\hline Right Turn on Red & \\
\hline Satd. Flow (RTOR) & \\
\hline Headway Factor & \\
\hline Link Speed (mph) & \\
\hline Link Distance (ft) & \\
\hline Travel Time (s) & \\
\hline Volume (vph) & \\
\hline Peak Hour Factor & \\
\hline Heavy Vehicles (\%) & \\
\hline Parking (\#/hr) & \\
\hline Adj. Flow (vph) & \\
\hline Lane Group Flow (vph) & \\
\hline Turn Type & \\
\hline Protected Phases & 4 \\
\hline Permitted Phases & \\
\hline Detector Phases & \\
\hline Minimum Initial (s) & 4.0 \\
\hline Minimum Split (s) & 24.0 \\
\hline Total Split (s) & 24.0 \\
\hline Total Split (\%) & 17\% \\
\hline Maximum Green (s) & 19.0 \\
\hline Yellow Time (s) & 3.0 \\
\hline All-Red Time (s) & 2.0 \\
\hline Lead/Lag & \\
\hline Lead-Lag Optimize? & \\
\hline Vehicle Extension (s) & 2.0 \\
\hline Recall Mode & None \\
\hline Walk Time (s) & 7.0 \\
\hline Flash Dont Walk (s) & 12.0 \\
\hline Pedestrian Calls (\#/hr) & 0 \\
\hline Act Effct Green (s) & \\
\hline Actuated g/C Ratio & \\
\hline v/c Ratio & \\
\hline Control Delay & \\
\hline Queue Delay & \\
\hline Total Delay & \\
\hline
\end{tabular}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\Rightarrow\) & \(\rightarrow\) & & 7 & & & 4 & \(\dagger\) & \(>\) & & \(\downarrow\) & \(\downarrow\) \\
\hline Lane Group & EBL & EBT & EBR & WBL & WBT & WBR & NBL & NBT & NBR & SBL & SBT & SBR \\
\hline LOS & & E & & & C & & & & & & F & \\
\hline Approach Delay & & 67.6 & & & 24.6 & & & & & & 729.3 & \\
\hline Approach LOS & & E & & & C & & & & & & F & \\
\hline Queue Length 50th (ft) & & 475 & & & 335 & & & & & & \(\sim 613\) & \\
\hline Queue Length 95th (ft) & & 710 & & & 362 & & & & & & \#785 & \\
\hline Internal Link Dist (ft) & & 475 & & & 190 & & & 269 & & & 505 & \\
\hline \multicolumn{13}{|l|}{Turn Bay Length (ft)} \\
\hline Base Capacity (vph) & & 868 & & & 1577 & & & & & & 449 & \\
\hline Starvation Cap Reductn & & 0 & & & 646 & & & & & & 0 & \\
\hline Spillback Cap Reductn & & 191 & & & 0 & & & & & & 272 & \\
\hline Storage Cap Reductn & & 0 & & & 0 & & & & & & 0 & \\
\hline Reduced v/c Ratio & & 1.07 & & & 0.84 & & & & & & 3.10 & \\
\hline \multicolumn{13}{|l|}{Intersection Summary} \\
\hline
\end{tabular}

Area Type: CBD
Cycle Length: 140
Actuated Cycle Length: 140
Offset: \(43(31 \%)\), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 227.6
Intersection LOS: F
Intersection Capacity Utilization 95.6\%
ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
Splits and Phases: 4: Tremont Street \& Parker Street

\begin{tabular}{l} 
Lane Group \(\quad \varnothing 4\) \\
\hline LOS \\
Approach Delay \\
Approach LOS \\
Queue Length 50th (ft) \\
Queue Length 95th \((\mathrm{ft})\) \\
Internal Link Dist (ft) \\
Turn Bay Length (ft) \\
Base Capacity (vph) \\
Starvation Cap Reductn \\
Spillback Cap Reductn \\
Storage Cap Reductn \\
Reduced v/c Ratio \\
Intersection Summary \\
\hline
\end{tabular}

\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|}
\hline & \(\checkmark\) & 4 & \(\dagger\) & & \(\pm\) & \(\pm\) & & & & \\
\hline Lane Group & WBL & WBR & NBT & NBR & SBL & SBT & \(\varnothing 1\) & \(\varnothing 3\) & \(\varnothing 10\) & \(\varnothing 14\) \\
\hline Queue Length 50th (ft) & 138 & 48 & 84 & 0 & 141 & 503 & & & & \\
\hline Queue Length 95th (ft) & 204 & 84 & m120 & m0 & 219 & 597 & & & & \\
\hline Internal Link Dist (ft) & 517 & & 82 & & & 466 & & & & \\
\hline Turn Bay Length (ft) & & & & & & & & & & \\
\hline Base Capacity (vph) & 708 & 924 & 1982 & 1047 & 253 & 1517 & & & & \\
\hline Starvation Cap Reductn & 0 & 0 & 363 & 781 & 0 & 0 & & & & \\
\hline Spillback Cap Reductn & 0 & 0 & 0 & 0 & 0 & 260 & & & & \\
\hline Storage Cap Reductn & 0 & 0 & 0 & 0 & 0 & 0 & & & & \\
\hline Reduced v/c Ratio & 0.31 & 0.18 & 0.98 & 0.46 & 0.63 & 0.97 & & & & \\
\hline
\end{tabular}

\section*{Intersection Summary}

\section*{Area Type: Other}

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 7 (5\%), Referenced to phase 2:SBT and 6:NBT, Start of Yellow
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 31.0 Intersection LOS: C
Intersection Capacity Utilization 57.8\% ICU Level of Service B
Analysis Period (min) 15
\(m\) Volume for 95 th percentile queue is metered by upstream signal.
Splits and Phases: 11: Tremont Crossing Site Drive \& Tremont Street

\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline & \(\dagger\) & & & \(p\) & & \(\downarrow\) & \\
\hline Movement & WBL & WBR & NBT & NBR & SBL & SBT & \\
\hline Lane Configurations & * \({ }^{\text {c }}\) & & \(\uparrow\) & & & \(\uparrow\) & \\
\hline Sign Control & Stop & & Free & & & Free & \\
\hline Grade & 0\% & & 0\% & & & 0\% & \\
\hline Volume (veh/h) & 33 & 167 & 189 & 0 & 0 & 342 & \\
\hline Peak Hour Factor & 0.63 & 0.79 & 0.87 & 0.25 & 0.92 & 0.81 & \\
\hline Hourly flow rate (vph) & 52 & 211 & 217 & 0 & 0 & 422 & \\
\hline Pedestrians & & & & & & & \\
\hline Lane Width (ft) & & & & & & & \\
\hline Walking Speed (ft/s) & & & & & & & \\
\hline Percent Blockage & & & & & & & \\
\hline Right turn flare (veh) & & & & & & & \\
\hline Median type & None & & & & & & \\
\hline Median storage veh) & & & & & & & \\
\hline Upstream signal (ft) & & & 585 & & & & \\
\hline pX, platoon unblocked & & & & & & & \\
\hline vC , conflicting volume & 639 & 217 & & & 217 & & \\
\hline \(\mathrm{vC1}\), stage 1 conf vol & & & & & & & \\
\hline \(\mathrm{vC2}\), stage 2 conf vol & & & & & & & \\
\hline vCu , unblocked vol & 639 & 217 & & & 217 & & \\
\hline tC, single (s) & 6.4 & 6.2 & & & 4.1 & & \\
\hline \(\mathrm{tC}, 2\) stage (s) & & & & & & & \\
\hline tF (s) & 3.5 & 3.3 & & & 2.2 & & \\
\hline p0 queue free \% & 88 & 74 & & & 100 & & \\
\hline cM capacity (veh/h) & 443 & 825 & & & 1364 & & \\
\hline Direction, Lane \# & WB 1 & NB 1 & SB 1 & & & & \\
\hline Volume Total & 264 & 217 & 422 & & & & \\
\hline Volume Left & 52 & 0 & 0 & & & & \\
\hline Volume Right & 211 & 0 & 0 & & & & \\
\hline cSH & 705 & 1700 & 1700 & & & & \\
\hline Volume to Capacity & 0.37 & 0.13 & 0.25 & & & & \\
\hline Queue Length 95th (ft) & 44 & 0 & 0 & & & & \\
\hline Control Delay (s) & 13.1 & 0.0 & 0.0 & & & & \\
\hline Lane LOS & B & & & & & & \\
\hline Approach Delay (s) & 13.1 & 0.0 & 0.0 & & & & \\
\hline Approach LOS & B & & & & & & \\
\hline \multicolumn{8}{|l|}{Intersection Summary} \\
\hline \multicolumn{3}{|l|}{Average Delay} & 3.8 & & & & \\
\hline \multicolumn{2}{|l|}{Intersection Capacity Utilization} & & 40.1\% & & ICU Level & of Service & A \\
\hline \multicolumn{2}{|l|}{Analysis Period (min)} & & 15 & & & & \\
\hline
\end{tabular}



\begin{tabular}{|c|c|c|c|}
\hline \multicolumn{4}{|l|}{lits and Phases: 2: Tremont Street \& Malcolm X Boulevard} \\
\hline -14.1 & \(>_{0}\) & \(\mathrm{Kg} 4{ }_{\text {¢ }}\) & 絭 9 \\
\hline 31 s & 13 s & 4s \({ }^{\text {2 } 27 \mathrm{~s}}\) & 15 s \\
\hline
\end{tabular}





\begin{tabular}{|c|c|c|c|c|}
\hline - \({ }^{2}\) & 14.1 & \(\stackrel{\square}{4}\) & 年最 & W \({ }^{\text {W }}\) \\
\hline 12s & 29 s & 298 & 4 S & 15 s \\
\hline
\end{tabular}




\section*{TRIP GENERATION CALCULATIONS}


Notes:
FILL IN SHADED CELLS ONLY



\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
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\footnotetext{
2．Mode shares based on peak－hour BTD Data for Area 5 ．
．Local vehicle occupancy rates based on 2009 National venicle occupancy rates．
Loce Trip Generation Rate，9th Edition，LUC 220 （Apartment）Average rate
ITTE
ITE Trip Generation Rate， \(9 t h\) Edition，LUC 710 （General Oftice Buiding），Average rate

}
Parcel 25 - Phase II
HOWARD/STEIN-HUDSON ASSOCIATE
\({ }^{21-\text {-May }-14}\)
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multirow[t]{2}{*}{Land Use} & \multirow[t]{2}{*}{Size} & \multirow[t]{2}{*}{Category} & \multirow[t]{2}{*}{Trip Rates (Trips/ksf or unit)} & \multicolumn{3}{|l|}{Vehicular Trip Generation} & \multicolumn{2}{|l|}{Conversion to Person Trips} & \multicolumn{6}{|l|}{Mode Share Split} & \multicolumn{4}{|l|}{Vehicular Trips} \\
\hline & & & & Unadjusted Vehicle Trips & \[
\begin{aligned}
& \text { Internal } \\
& \text { Capture } \\
& \text { Trips }
\end{aligned}
\] & Unadjusted Vehicle Trip
less capture less captur & \[
\begin{aligned}
& \text { Assumed national } \\
& \text { vehicle occupancy } \\
& \text { rate' }
\end{aligned}
\] & Converted to New
Person tips & Transit
Share & Transit
Trips & \begin{tabular}{l}
Other Share \\
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Other Share²
\end{tabular} & Walk/ Bike Other Trips & \[
\begin{aligned}
& \text { Vehicle } \\
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\] & \[
\begin{aligned}
& \text { Pass-By } \\
& \text { vehicle } \\
& \text { vhare }
\end{aligned}
\] & Total Vehicle Pass By Person Trips & Assumed local auto occupancy rate for autos \({ }^{5}\) & Total Adjusted Auto Trips \\
\hline \multicolumn{19}{|l|}{Daily} \\
\hline \multirow[t]{3}{*}{Apartment \({ }^{\text {a }}\)} & 48 & Total & 6.65 & 320 & & 320 & 1.13 & 362 & & 54 & & \({ }^{138}\) & & 170 & & & 1.18 & 144 \\
\hline & Units & In & 3.33 & 160 & & 160 & 1.13 & 181 & 15\% & 27 & 38\% & 69 & 47\% & 85 & & & 1.18 & 72 \\
\hline & & Out & 3.33 & 160 & & 160 & 1.13 & 181 & 15\% & 27 & 38\% & 69 & 47\% & 85 & & & 1.18 & 72 \\
\hline \multicolumn{19}{|l|}{a.m. Peak Hour} \\
\hline \multirow[t]{3}{*}{Apartment \({ }^{\text {a }}\)} & 48 & Total & 0.51 & 24 & & 24 & 1.13 & 27 & & 5 & & \({ }^{12}\) & & 10 & & & 1.18 & 9 \\
\hline & Units & In & 0.10 & 5 & & 5 & 1.13 & & 21\% & 1 & 39\% & 2 & 40\% & & & & 1.18 & 2 \\
\hline & & Out & 0.41 & 19 & & 19 & 1.13 & 21 & 17\% & 4 & 46\% & 10 & 37\% & 8 & & & 1.18 & 7 \\
\hline \multicolumn{19}{|l|}{p.m. Peak Hour} \\
\hline \multirow[t]{3}{*}{Apartment \({ }^{4}\)} & 48 & Total & 0.62 & 30 & & 30 & 1.13 & 34 & & 6 & & 15 & & 13 & & & 1.18 & \({ }^{11}\) \\
\hline & Units & In & 0.40 & 20 & & 20 & 1.13 & \({ }^{23}\) & 17\% & 4 & 46\% & 11 & 37\% & 9 & & & 1.18 & 8 \\
\hline & & Out & 0.22 & 10 & & 10 & 1.13 & 11 & 21\% & 2 & 39\% & 4 & 40\% & 4 & & & 1.18 & 3 \\
\hline
\end{tabular}

\footnotetext{
2. Mode shares based on peak-hour BTD Data for Area 5 .
3. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates.
3. Local vehicle occupancy rates based on 2009 National venicle occupancy
4. ITE Trip Generation Rate, 9th Edition, LUC 220 (Apartment) Average rate
}
Parcel 25 - Phase III
Trip Generation Assessment
\begin{tabular}{|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline \multirow[t]{2}{*}{Land Use} & \multirow[t]{2}{*}{Size} & \multirow[t]{2}{*}{Category} & \multirow[t]{2}{*}{Trip Rates (Trips/ksf or unit)} & \multicolumn{3}{|l|}{Vehicular Trip Generation} & \multicolumn{2}{|l|}{Conversion to Person Trips} & \multicolumn{6}{|l|}{Mode Share Split} & \multicolumn{4}{|l|}{Vehicular Trips} \\
\hline & & & & Unadjusted Vehicle Trips & Internal Capture Trips & Unadjusted Vehicle Trips less capture & Assumed national vehicle occupancy rate \({ }^{1}\) & Converted to New Person trips & \[
\begin{aligned}
& \text { Transit } \\
& \text { Share }^{2}
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\] & \[
\begin{aligned}
& \text { Transit } \\
& \text { Trips }
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\] & Walk/Bike/
Other Share \({ }^{2}\) & Walk/ Bike/ Other Trips & Vehicle Share \({ }^{2}\) & Total Vehicle Person Trips & Pass-By vehicle Share & Total Vehicle PassBy Person Trips & Assumed local auto occupancy rate for autos \({ }^{3}\) & Total Adjusted \\
\hline \multicolumn{19}{|l|}{Daily} \\
\hline \multirow[t]{3}{*}{Office \({ }^{8}\)} & 162 & Total & 11.70 & 1,890 & & 1,890 & 1.13 & 2,136 & & 492 & & 428 & & 1,218 & & & 1.18 & 1,032 \\
\hline & kSF & In & 5.85 & 945 & & 945 & 1.13 & 1,068 & 23\% & 246 & 20\% & 214 & 57\% & 609 & & & 1.18 & 516 \\
\hline & & Out & 5.85 & 945 & & 945 & 1.13 & 1,068 & 23\% & 246 & 20\% & 214 & 57\% & 609 & & & 1.18 & 516 \\
\hline \multicolumn{19}{|l|}{a.m. Peak Hour} \\
\hline \multirow[t]{3}{*}{Office \({ }^{8}\)} & 162 & Total & 1.74 & 281 & & 281 & 1.13 & 317 & & 100 & & 66 & & 152 & & & 1.18 & 129 \\
\hline & kSF & In & 1.53 & 247 & & 247 & 1.13 & 279 & 32\% & 89 & 20\% & 56 & 48\% & 134 & & & 1.18 & 114 \\
\hline & & Out & 0.21 & 34 & & 34 & 1.13 & 38 & 28\% & 11 & 25\% & 10 & 47\% & 18 & & & 1.18 & 15 \\
\hline \multicolumn{19}{|l|}{p.m. Peak Hour} \\
\hline \multirow[t]{3}{*}{Office \({ }^{8}\)} & 162 & Total & 1.61 & 259 & & 259 & 1.13 & 293 & & 92 & & 62 & & 141 & & & 1.18 & 119 \\
\hline & KSF & In & 0.27 & 44 & & 44 & 1.13 & 50 & 28\% & 14 & 25\% & 13 & 47\% & 24 & & & 1.18 & 20 \\
\hline & & Out & 1.33 & 215 & & 215 & 1.13 & 243 & 32\% & 78 & 20\% & 49 & 48\% & 117 & & & 1.18 & 99 \\
\hline
\end{tabular}
1. 2009 National vehicle occupancy rates -1.13 :home to work; 1.84 : family/personal business; 1.78 : shopping; 2.2 social/recreational
2. Mode shares based on peak-hour BTD Data for Area 5 .
3. Local vehicle occupancy rates based on 2009 National vehicle occupancy rates.
8. ITE Trip Generation Rate, 9th Edition, LUC 710 (General Office Building), Equation


Notes:
FILL IN SHADED CELLS ONLY


Notes:
FILL IN SHADED CELLS ONLY
Enter percentage
Percentages obtained from the ITE Trip Generation Handbook (2004) pages 93 and 94
\begin{tabular}{ccccccccc} 
& \multicolumn{3}{c}{ Retail - Internal Trips } & & & \\
& & Enter & Exit & & & \multicolumn{2}{c}{ Residential - Internal Trips } \\
Total & \#REF! & 2 & 3 & & Total & \#REF! & Enter & Exit \\
Retail & \#REF! & \#REF! & \#REF! & Apartment & \#REF! & \#REF! & \#REF! \\
Café & \#REF! & \#REF! & \#REF! & Condo & \#REF! & \#REF! & \#REF! \\
Restaurant & \#REF! & \#REF! & \#REF! & & & & &
\end{tabular}
\(\underset{\text { Trip Generation Assessment }}{\text { Parcel } 25 \text {－Full Build }}\) Trip Generation Assessment
HOWARD／STEIN－HUDSON ASSOCIATES
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[^0]:    | 51 | 24 | 35 | Total |  |  | Pertified 40 to 49 points |
    | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

[^1]:    ${ }^{1}$ US EPA, "Guidelines for Air Quality Maintenance Planning and Analysis Volume 9 (Revised): Evaluating Indirect Sources," EPA-450/4-78-001, September 1978.

[^2]:    ${ }^{2}$ U.S. EPA, User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollution Concentrations Near Roadway Intersections, Office of Air Quality Planning and Standards, September 1995.

[^3]:    ${ }^{3}$ California Department of Transportation, CALINE-3, A Versatile Dispersion Model for Predicting Air Pollutant Levels Near Highways and Arterial Streets, FHWA/CA/TL-79/23, Sacramento, CA, November 1979.

[^4]:    ${ }^{4}$ U.S. EPA, Guideline for Modeling Carbon Monoxide from Roadway Intersections, EPA-454/R-92-005, Office of Air Quality Planning and Standards, November 1992.
    ${ }^{5}$ U.S. EPA, User's Guide to MOBILE6. 1 and MOBILE6.2: Mobile Source Emission Factor Model, EPA420-R-02-028, Office of Transportation and Air Quality, October 2002.

[^5]:    ${ }^{6}$ American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc., 1989 ASHRAE Handbook--Fundamentals (IP) Edition, Atlanta, GA, 1989.

[^6]:    ${ }^{7}$ Cadna-A Computer Aided Noise Abatement Program, Version 4.3

[^7]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^8]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^9]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^10]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^11]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^12]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^13]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^14]:    *Assumes full-load operation of all mechanical equipment.
    Note: DEP Policy allows a sound level increase of up to 10 dBA .

[^15]:    *Property also designated as a Boston Landmark

[^16]:    Notes: 1. Manhole numbers were taken from BWSC Sewer system Map No. 19H
    2. Invert elevations were taken from BWSC Sewer system Map no. 19H and the existing conditions plan entitled "ALTA/ACSM Land Title Survey, Boston, Mass.", dated 4/19/97, prepared by Feldman Professional Land Surveyors.
    3. Flow Calculations based on Manning Equation
    4. Elevations refer to Boston City Base (BCB).

[^17]:    8 Trip Generation Manual, $9^{\text {th }}$ Edition; Institute of Transportation Engineers; Washington, D.C.; 2012.

[^18]:    ${ }^{9}$ Summary of Travel Trends: 2009 National Household Travel Survey; FHWA; Washington, D.C.; June 2011.

[^19]:    * Applicable to the hourly mean wind speed exceeded one percent of the time.

