Data Sciences Center
Boston University

Volume 2: Draft Project Impact Report Appendices

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submitted to the **Boston Planning & Development Agency**

submitted by **Trustees of Boston University**

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BOSTON UNIVERSITY

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Appendix A

SCOPING DETERMINATION WITH RESPONSES TO COMMENTS ON THE PNF

SUBMISSION REQUIREMENTS

FOR

BOSTON UNIVERSITY

DATA SCIENCES CENTER PROJECT
DRAFT PROJECT IMPACT REPORT

The Scope requests information required by the BPDA for its review of the Proposed Project in connection with the following:

1. Certification of Compliance and approval of the Proposed Project pursuant to Article 80, Section 80B of the Code.

2. Certification of Consistency with the BU Institutional Master Plan pursuant to Article 80, Section 80D-10 of the Code.

The requirements below apply to the Draft Project Impact Reports (DPIRs) for the Proposed Project.

Subsequent to the end of the forty-five (45) day public comment period on the DPIR, the BPDA will issue a Preliminary Adequacy Determination ("PAD") that indicates the additional steps necessary for BU to satisfy the requirements of the Scoping Determination and all applicable sections of Article 80 of the Code. If the BPDA finds that the DPIR adequately describes the Proposed Projects' impacts and, if appropriate, propose satisfactory measures to mitigate, limit or minimize such impacts, the PAD will announce such a determination and that the requirements for the filing and review of a Final Project Impact Report ("FPIR") are waived pursuant to Section 80B-5.4(c)(iv) of the Code. Before reaching said findings, the BPDA shall hold a public hearing pursuant to Article 80 of the Code. Sections 80B-6 and 80D-10 require the Director of the BPDA to issue a Certification of Compliance and a Certification of Consistency, respectively, before the Commissioner of Inspectional Services can issue any building permit for the Proposed Project.

The DPIR may be consolidated with the IMP Amendment. In addition to full-size scale drawings, ten (10) hard copies of the full bound report should be submitted to the BPDA, in addition to an electronic version in .pdf format. Hard copies of the document should be available for distribution to the BU Task Force, community groups, and other interested parties in support of the public review process. The report should contain all submission materials reduced to size 8-1/2"x11", except where otherwise specified, and should be printed on both sides of the page. A copy of this Scoping Determination must be included in the report submitted for review.

The DPIR should include the following elements.

1. GENERAL INFORMATION

- **Applicant/Proponent Information.** Pursuant to Article 80B, the DPIR should provide the following information:

  - Development Team
    - Names of developer(s), including description of development entity(ies), attorney, project consultants and architects.
    - Business address, telephone number, fax number and e-mail, where available, for each.
    - Designated contact for each.
  - Legal Information
    - Legal judgments or actions pending concerning the Proposed Project
    - History of tax arrears on property owned in Boston by Applicant.
    - Evidence of site control over project area, including current ownership and purchase options of all parcels in the Proposed Project, all restrictive covenants and contractual restrictions affecting the Proponent's right or ability to accomplish the Proposed Project, and the nature of the agreements for securing parcels not owned by the Applicant.
    - Nature and extent of any and all public easements into, through, or surrounding the site.

- **Disclosure of Beneficial Interests.** Disclosure of Beneficial Interests in the Proposed Project must be provided pursuant to Section 80B-8 of the Boston Zoning Code.
- **Regulatory Controls and Permits.** The DPIR shall include an up-to-date listing of all anticipated permits or approvals required from other municipal, state or federal agencies, including a proposed application schedule. A statement on the applicability of the Massachusetts Environmental Policy Act ("MEPA") should be provided. If the Proposed Project is subject to MEPA, all required documentation should be provided to the BPDA, including but not limited to, copies of the Environmental Notification Form, decisions of the Secretary of Environmental Affairs, and the proposed schedule for coordination with BPDA procedure.

2. PROJECT DESCRIPTION

- **Project Site.** The DPIR shall include a complete description of the Project Site including, at minimum, square footage of the site, a map indicating the boundaries, a legal description including metes and bounds, existing site conditions, and the surrounding development context, i.e. a description of the surrounding environment including the height, other dimensions, use, and other relevant characteristics of existing nearby buildings, as well as an inventory of surrounding proposed projects. Only projects that

have completed or are currently undergoing Article 80 review should be included and should be included as proposed in their filings at the Boston Planning & Development Agency. The Project Site, as defined in the DPIR, must be utilized for each Project Description and for any calculations or comparisons.

- **Project Description.** The DPIR shall contain a full description of the Proposed Project and any alternative(s) and their elements, including size, physical characteristics, FAR (utilizing the definition for calculation as provided for in the Boston Zoning Code), and proposed uses, including any uses planned or considered for all elements of the project during the summer months.

3. PROJECT ALTERNATIVES

The analyses as provided for in the Transportation Component, Environmental Protection Component, and Urban Design Component sections of this Scoping Determination, as well as any additional analysis specified by the BPDA, shall be required for the following alternatives:

- **Alternative 1.** No build as a means of measuring the baseline.
- **Alternative 2.** A compliant project according to the underlying zoning.
- **Alternative 2.** A compliant project according to the existing IMP
- **Alternative 4.** See Urban Design comments for alternates.

4. TRANSPORTATION COMPONENT

The DPIR shall include a detailed traffic and transportation analysis that examines the Proposed Project's impact on the transportation network and proposes measures intended to mitigate, limit, or minimize any adverse impact reasonably attributable to the Proposed Project. The scope of the analysis must utilize as its framework the Transportation Access Plan guidelines to be further defined in consultation with the Boston Transportation Department ("BTD"). Pursuant to Section 80B-3.1 of the Boston Zoning Code, this section of the DPIR should contain, at a minimum, the following elements. Additional questions and required submissions have been added to the baseline requirements of Article 80 based on concerns specific to the project and on comment letters. Not all items will apply to the Proposed Project. Please reach out to the Boston Transportation Department to discuss attached comment letter.

- **Traffic Management Element.** BU shall work with BTD to identify applicable items of study:

    - Identify the Proposed Project's impact on the transportation network from expected travel volumes, vehicle trip generation, and directional distribution; the location of loading and unloading activities, including service and delivery; the Proposed Project's impact on the vehicular and circulation systems within the impact area, including the

number and type of vehicles, pedestrians, and bicyclists, vehicle occupancy rates (VOR), and the Proposed Project's impact on road corridors and intersection capacities, including Levels of Service and intersection delays from 6:00 a.m. to 8:00 p.m. and for any other times of day that significant activity is anticipated in the Proposed Project.

- Inventory, map, and discuss on- and off-street loading, provide estimates of the level of loading and delivery activity, and describe in detail any special loading policies and procedures to be implemented.
- Identify mitigation procedures that are intended to mitigate, limit, or minimize the number of vehicle trips generated by the development, and the Proposed Project's interference with the safe and orderly operation of the transportation network; such measures may include an on-site traffic circulation plan, flexible employee work hours, dissemination of transit information, changes in traffic patterns, and full or partial subsidies for public mass transit.
- The DPIR shall describe Transportation Demand Management ("TDM") measures that are being considered for the Proposed Project.
- Review provisions for service and emergency vehicle access to the proposed dormitory building.

- **Parking Management Element.** BU shall work with BTD to:

  - Identify the location of proposed drop-off/pick-up, short-term parking, loading, and queuing for both autos and trucks. If no queuing area is available for trucks, identify steps to be taken to avoid negative impacts, referencing the projected frequency of delivery activity and any operational procedures to ensure that deliveries are adequately timed and spaced out.
  - Identify the demand created by the Proposed Project for tenant, commuter, and short- and long-term visitor parking; non-tenant and other parking needs within the Impact Area; and evening and weekend parking needs
  - Include operational policies and strategies for the Proposed Project that address the location, cost, and number of public, private, high-occupancy vehicle, and special-needs parking demand; short-term and long-term space availability; pricing structure of parking rates; location and type of off-site parking; and methods of transporting people to the site from off-site parking;
  - Document parking impacts of the Proposed Project. Describe alternative off-street parking locations for displaced parkers as necessary.

- **Article 80 Construction Management Element.** The Construction Management Element shall, at a minimum:

  - Identify the impact from the timing and routes of truck movement and construction deliveries for the Proposed Project; proposed street closings; and the need for employee parking.

- Identify, and provide a plan for implementing, mitigation measures that are intended to mitigate, limit, or minimize, to the extent economically feasible, the construction impact of the Proposed Project by limiting the number of construction vehicle trips generated by the Proposed Project, the demand for construction-related parking (both on-site and off-site), and the interference of building construction with the safe and orderly operation of the Transportation Network, such measures to include the use of alternative modes of transport for employees and materials to and from the site; appropriate construction equipment, including use of a climbing crane; staggered hours for vehicular movement; traffic controllers to facilitate equipment and trucks entering and exiting the site; covered pedestrian walkways; alternative construction networks and construction planning; and restrictions of vehicular movement
- Designate a liaison between the Proposed Project, public agencies, and the surrounding residential and business communities.

- **Pedestrian Analysis.** Address the adequacy of sidewalks and other pedestrian infrastructure in the area of the Proposed Projects and potential safety issues at pedestrian crossings. Propose improvements to facilitate pedestrian circulation to and around the Proposed Project and ways that development can improve the overall pedestrian circulation system of the campus.
- **Mitigation.** Identify measures to mitigate any transportation impacts identified in the preceding sections.

5. ENVIRONMENTAL PROTECTION COMPONENT

The DPIR shall contain an Environmental Protection Component as outlined below. Opportunities for sustainable design, as well as other issues, are described in the written comments from public agencies. These comments are included in Appendix 1 and are incorporated herein by reference and made a part hereof. The analyses as provided for in the Environmental Protection Component section of this Scoping Determination shall be required for each of the alternatives.

- **Wind.** A quantitative wind tunnel analysis of the potential pedestrian level wind impacts shall be required for the DPIR. Wind sensor locations need to be approved by BPDA Environmental review and BPDA Urban Design before the test is done This analysis shall determine potential pedestrian level winds adjacent to and in the vicinity of the project site and shall identify the projected annual wind speeds for each season at each location. Expected wind levels should be reported using the amended Melbourne scale. The DPIR shall identify any areas where wind velocities are expected to exceed acceptable levels, including the BRA's guideline of an effective gust velocity of 31 mph not to be exceeded more than 1% of the time.

Particular attention shall be given to areas of pedestrian use, including, but not limited to, the entrances to the proposed buildings and existing buildings in the vicinity of the Proposed Project, the sidewalks and walkways within and adjacent to the Proposed Project development and in the vicinity of the proposed development. Specific locations to be evaluated shall be determined in consultation with the BRA and the City of Boston Environment Department.

For areas where wind speeds are projected to exceed acceptable levels, measures to reduce wind speeds and to mitigate potential adverse impact shall be identified and tested in the wind tunnel to quantify the expected benefit. Should the qualitative analysis indicate the possibility of excessive or unacceptable pedestrian level wind speeds, additional study may be required.

The wind tunnel testing shall be conducted in accordance with the following guidelines and criteria:

- Data shall be presented for both the existing (no-build) and for the future build scenario(s) (see above).
- The analysis shall include the mean velocity exceeded 1% of the time and the effective gust velocity exceeded 1% of the time. The effective gust velocity shall be computed as the hourly average velocity plus 1.5 x root mean square variation about the average. An alternative velocity analysis (e.g., equivalent average) may be presented with the approval of the Authority.
- Wind direction shall include the sixteen compass points. Data shall include the percent or probability of occurrence from each direction on seasonal and annual bases.
- Results of the wind tunnel testing shall be presented in miles per hour (mph).
- Velocities shall be measured at a scale equivalent to an average height of 4.5-5 feet.
- The model scale shall be such that it matches the simulated earth's boundary and shall include all buildings within at least 1,600 feet of the project site. All buildings taller than 25 stories and within 2,400 feet of the project site should be placed at the appropriate location upstream of the project site during the test. The model shall include all buildings recently completed, under construction, and planned within 1,500-2,000 feet of the project site. Prior to testing, the model shall be reviewed by the Authority. Photographs of the area model shall be included in the written report.
- The written report shall include an analysis which compares mean and effective gust velocities on annual and seasonal bases, for no-build and build conditions, and shall provide a descriptive analysis of the wind environment and impacts for each sensor point, including such items as the source of the winds, direction, seasonal variations, etc., as applicable. The report shall also include an analysis of the suitability of the locations for various activities (e.g., walking, sitting, standing, driving etc.) as appropriate, in accordance with Melbourne comfort categories.

- The report also shall include a description of the testing methodology and the model, and a description of the procedure used to calculate the wind velocities (including data reduction and wind climate data). Detailed technical information and data may be included in a technical appendix but should be summarized in the main report.
- The pedestrian level wind impact analysis report shall include, at a minimum, the following maps and tables:

    - Maps indicating the location of the wind impact sensors, for the existing (no-build) condition and future build scenario(s).
    - Maps indicating mean and effective gust wind speeds at each sensor location, for the existing (no-build) condition and each future build scenario, on an annual basis and seasonally. Dangerous and unacceptable locations shall be highlighted.
    - Maps indicating the suitability of each sensor location for various pedestrian-related activities (comfort categories), for the existing (no-build) condition and each future build scenario, on an annual basis and seasonally. To facilitate comparison, comfort categories may be distinguished through color coding or other appropriate means. In any case, dangerous and unacceptable conditions shall be highlighted.
    - Tables indicating mean and effective gust wind speeds and the comfort category at each sensor location, for the existing (no build) condition and for each future build scenario, on an annual basis and seasonally.
    - Tables indicating the percentage of wind from each of the sixteen compass points at each sensor location, for the existing (no-build) condition and for each future build scenario, on an annual basis and seasonally.
    - All maps should include a north arrow and be oriented and of the same scale as shadow diagrams.

- **Shadow.** A shadow analysis shall be required for existing and build conditions for the hours 9:00 a.m., 12:00 noon, and 3:00 p.m. for the vernal equinox, summer solstice, autumnal equinox, and winter solstice and for 6:00 p.m. during the summer and autumn. This analysis should use the same metrics as applied by Mass. DEP for Chapter 91 shadow analyses and include documentation of net new shadows lasting more than one hour. It should be noted that due to time differences (daylight savings vs. standard), the autumnal equinox shadows would <u>not</u> be the same as the vernal equinox shadows and therefore separate shadow studies are required for the vernal and autumnal equinoxes. Shadows shall be determined using the Boston Altitude and Azimuth data (Sun Altitude/Azimuth Table, Boston, Massachusetts).

  The shadow impact analysis must include net new shadow as well as existing shadow. Diagrams must clearly show the incremental impact of the proposed new buildings. For purposes of clarity, new shadow should be shown in a dark, contrasting tone distinguishable from existing shadow. The shadow impact study area shall include, at a

minimum, the entire area to be encompassed by the maximum shadow expected to be produced by the Proposed Project (i.e., at the winter solstice). The build condition shall include all buildings under construction and any proposed buildings anticipated to be completed prior to completion of the Proposed Project. Shadow from all existing buildings within the shadow impact study area shall be shown. A North arrow shall be provided on all figures and street names, doorways, bus stops, open space and areas where pedestrians are likely to congregate (in front of historic resources or other tourist destinations, for example) should be identified.

Particular attention shall be given to areas of pedestrian use, including, but not limited to, the entrances to the project buildings and existing buildings in the vicinity of the Proposed Project, the sidewalks and walkways within and adjacent to the Proposed Project development.

The DPIR should propose mitigation measures to minimize or avoid any adverse shadow impact.

- **Combined Wind and Shadow Impacts.** Figures depicting no-build and build wind monitoring locations should be of an orientation and scale consistent with that used for shadow diagrams so that the cumulative effect of wind and shadow can be determined.
- **Daylight.** A daylight analysis for both build and no-build conditions shall be conducted by measuring the percentage of skydome that is obstructed by the Proposed Project and evaluating the net change in obstruction. The study should treat two elements as controls for data comparisons: existing conditions and context examples. Daylight analyses should be taken for each major building facade fronting these essentially public ways or open spaces. The midpoint of each public access way or roadway should be taken as the study point. The BRADA program must be used for this analysis.
- **Solar Glare.** Please refer to the BRA's Environmental Review comment letter.
- **Air Quality.** Please refer to the BRA's Environmental Review Comment letter.

- **Solid and Hazardous Wastes.** The presence of any contaminated soil or groundwater and any underground storage tanks at the project site shall be evaluated and remediation measures to ensure their safe removal and disposal shall be described. Any assessment of site conditions pursuant to the requirements of M.G.L. Chapter 21E that has been or will be prepared for the site shall be included in the DPIR (reports may be included in an appendix but shall be summarized in detail, with appropriate tables and figures, within the main text). Materials in the building to be demolished should be characterized and measures to mitigate impacts during demolition should be identified.

  The DPIR shall quantify and describe the generation, storage, and disposal of all solid wastes from the construction and operation of the Proposed Project. The DPIR shall identify the specific nature of any hazardous wastes that may be generated and their quantities and shall describe the management and disposal of these wastes. In addition,

measures to promote the reduction of waste generation and recycling, particularly for paper, glass, plastics, metals, and other recyclable products, and compliance with the City's recycling program, shall be described in the DPIR.

- **Noise.** The DPIR shall establish the existing noise levels at the project site and vicinity based upon a noise-monitoring program and shall calculate future noise levels after project completion based on appropriate modeling and shall demonstrate compliance with the Design Noise Levels established by the U.S. Department of Housing and Urban Development for residential and other sensitive receptors and with all other applicable Federal, State, and City of Boston noise criteria and regulations. Any required mitigation measures to minimize adverse noise impacts shall be described.

  An analysis of the potential noise impacts from the project's mechanical and exhaust systems, including emergency generators, and compliance with applicable regulations of the City of Boston shall be required. A description of the project's mechanical and exhaust systems and their location shall be included. Measures to minimize and eliminate adverse noise impacts on nearby sensitive receptors, including the project itself, from mechanical systems and traffic shall be described.

- **Nighttime Lighting.** The DPIR should explain, in text or graphics as appropriate:
  - The type of exterior lighting to be used on each façade or other portion of the building and the elements of the design that mitigate nighttime lighting impacts of the building on surrounding areas.
  - The DPIR should specify the type of interior lighting (i.e. fluorescent vs. incandescent, recessed or not) to be used in each portion of the building and, in the case of the common areas and non-residential portions of the program, the hours that the lighting will be on. The DPIR should also discuss the measures being taken to minimize the impact of interior lighting on the surrounding areas.

- **Stormwater Management/Water Quality.** Stormwater management requirements and suggestions are included in the section on environmental sustainability below.
- **Flood Hazards/Wetlands.** Describe any affected flood hazard zones or wetlands and proposed actions.
- **Tidelands/Chapter 91.** The project site does not include tidelands, and Chapter 91 does not apply to the Proposed Project.
- **Geotechnical Impact/Groundwater.** A description and evaluation analysis of existing sub-soil conditions at the project site, groundwater levels, potential for ground movement and settlement during excavation and foundation construction, and potential impact on adjacent buildings, utility lines, and the roadways shall be required. This analysis shall also include a description of the foundation construction methodology, the amount and method of excavation, and measures to prevent any adverse effects on adjacent buildings, utility lines, and roadways. Measures to ensure that groundwater levels will be maintained and will not be lowered during or after construction also shall

be described. In addition, the geotechnical analysis shall evaluate the earthquake potential in the project area and shall describe measures to be implemented to mitigate any adverse impacts from an earthquake event.

- **Construction Impacts.** A construction impact analysis shall include a description and evaluation of the following:
  - Measures to protect the public safety.
  - Potential dust and pollutant emissions and mitigation measures to control these emissions.
  - Potential noise generation and mitigation measures to minimize increase in noise levels.
  - Location of construction staging areas and construction worker parking; measures to encourage carpooling and/or public transportation use by construction workers.
  - Construction schedule, including hours of construction activity.
  - Access routes for construction trucks and anticipated volume of construction truck traffic.
  - Construction methodology (including foundation construction), amount and method of excavation required, disposal of the excavate, description of foundation support, maintenance of groundwater levels, and measures to prevent any adverse effects or damage to adjacent structures and infrastructure.
  - Method of demolition of the existing building on the project site and disposal of the demolition debris.
  - Potential for the recycling of construction and demolition debris, including asphalt from the existing parking lots.
  - Measures to make construction fencing as attractive as possible to ensure the visual character of the streetscape.
  - Identification of best management practices to control erosion and to prevent the discharge of sediments and contaminated groundwater or stormwater runoff into the City's drainage system during the construction period.
  - Impact of project construction on rodent populations and description of the proposed rodent control program, including frequency of application and compliance with applicable City and State regulatory requirements.

6. URBAN DESIGN COMPONENT

BU will be expected to undertake design review on the Proposed Project in accordance with standard BPDA procedure. In addition to the BPDA's Urban Design Department, the Boston Civic Design Commission (BCDC) will review the Proposed Project. The DPIR should also respond to the following elements.

- **Signage and Lighting.** BU will be required to perform design review with the BPDA Urban Design Department on any current and future plans for signage and lighting.
- **Views.** The DPIR shall present views of the Proposed Project from locations to be determined through consultation with the BRA's Urban Design Department.

- **Relationship to Surrounding Context.** The DPIR should describe the design of the Proposed Project in relationship to the surrounding urban context, including adjacent buildings, streets, and plazas.
- **Design Submission Requirements.** The following urban design materials for the Proposed Project's schematic design must be submitted for the DPIR. Materials must be at the required scale and in a printed form that is reproducible, as well as in electronic file form:
  - A written description of program elements and space allocation for each element.
  - Black and white 8"x10" photographs of the site and neighborhood.
  - Plans and sections for the area surrounding the project at an appropriate scale (1"=100' or larger) showing relationships of the Proposed Project to the surrounding area and district regarding massing, building height, open space, major topographic features, pedestrian and vehicular circulation, and land use.
  - Sketches and diagrams of alternative proposals to clarify design issues and massing options.
  - Eye-level perspectives showing the proposal in the context of the surrounding area; views should display a particular emphasis, on important viewing areas such as key intersections, access ways, or public parks/attractions. Long-ranged (distanced) views of the Proposed Project must also be studied to assess the impact on the skyline or other view lines. At least one bird's-eye perspective should also be included. All perspectives should show (in separate comparative sketches) both the build and no-build conditions. The BRA must approve the view locations before analysis is begun. View studies should be cognizant of light and shadow, massing and bulk.
  - Aerial views of the project in perspective or isometric form.
  - A site plan at 1 "= 16' or larger showing:
    - Relationships of proposed and existing adjacent buildings and open spaces.
    - Open spaces defined by buildings on adjacent parcels and across streets.
    - Location of pedestrian ways, driveways, parking, service areas, streets, and major landscape features.
    - Accessible pedestrian, vehicular, and service access and flow through the parcel and to adjacent areas.
    - Phasing possibilities clearly indicating the scheme for completing the improvements.
    - Construction limits.
  - Site sections at 1"=16' or larger showing relationships to adjacent buildings and spaces.
  - A massing model at 1"=40' showing all buildings in the area and a study model at 1"=16' showing facade design.
  - Drawings at an appropriate scale (e.g., 1"=8') describing architectural massing, facade design, and proposed materials including:
    - Site plans before and after construction.
    - Elevations in the context of the surrounding area.
    - Sections showing organization of functions and spaces.

- Building plans showing ground floor and typical upper floor.

- A site survey at 1"=40' showing nearby structures, utilities and bench marks.
- A written and/or graphic description of the building materials and its texture, color, and general fenestration patterns is required for the proposed development.
- Electronic files describing the site and Proposed Project at Representation Levels one and two ("Streetscape" and "Massing") as described in the document Boston "Smart Model": CAD & 3D Model Standard Guidelines.
- The schedule for submittal of Design Development materials.

7. ENVIRONMENTAL SUSTAINABILITY

In addition to the overall campus-wide approach to sustainability discussion in the IMP Amendment, new development of the size and complexity of the Proposed Project presents opportunities for sustainable design and construction to prevent damage to the environment, consistent with the goals of Executive Order 385 and recent initiatives of the Mayor and the BPDA. Opportunities for sustainable design are described below and are incorporated herein by reference and made a part hereof. Not all the topics below need be addressed in the DPIR; rather, some of them constitute suggestions that can be discussed through the design process in conjunction with the BPDA and the Environment Department.

- **Building Orientation, Envelope, and Façade Design.** Reduce thermal loads entering the building as much as possible. Consider the building orientation, envelope, and design carefully, including glazing selection, window and door shading, wall construction, roof color, and building shape. Make use of thermal mass to absorb heat and shift peak heating to off-peak hours. Building massing and façade treatment should respond to microclimate conditions and enhance appropriate solar control. The DPIR should describe any simulation designed to quantify the effects of these design choices.
- **Energy.** Energy conservation strategies should be explored at an early stage in the design and should include such approaches as taking advantage of natural day lighting, passive solar gain, passive cooling and ventilation which tie into HVAC systems, use of alternative energy strategies (including making the building design adaptable for the future inclusion of innovative energy and environmental technologies as they develop over time), in addition to properly sized efficient heating and ventilating systems, with heat recovery and other conservation strategies. Siting, orientation and massing of building should optimize passive strategies for light and energy management and design for natural and displacement ventilation. Building design should specify energy efficient HVAC and lighting systems, appliances, and other equipment, and solar preheating of makeup air. Early quantification and cost-benefit analysis through iterative energy simulation is helpful and would provide feedback on size of systems and envelope design early enough to impact those decisions.

- **Water Management.** Sustainable water management practices should be considered early in the site and building design process, and the process should explore integrated approaches to stormwater retention, treatment, and reuse, building and landscape water needs, and groundwater recharge. To the extent possible, the systems put in place should strive to work with the natural hydrology of the area, and the building should incorporate additional opportunities to conserve water beyond water-saving technologies required by law.

  Possibilities for using graywater for functions that are conventionally served by potable water should be explored. Stormwater captured from impervious areas or from roofs and hardscapes can be used for non-potable water uses.

  The DPIR shall contain an evaluation of the project site's existing and future stormwater drainage and stormwater management practices. The DPIR shall illustrate existing and future drainage patterns from the project site and shall describe and quantify existing and future stormwater runoff from the site and the Proposed Project's impacts on site drainage. The Proposed Project's stormwater management system, including best management practices to be implemented, measures proposed to control and treat stormwater runoff and to maximize on-site retention of stormwater, measures to prevent groundwater contamination, and compliance with the Commonwealth's Stormwater Management Policies, also shall be described. The DPIR shall describe the project area's stormwater drainage system to which the project will connect, including the location of stormwater drainage facilities and ultimate points of discharge.

8. HISTORIC RESOURCES COMPONENT

The DPIR should summarize any historic resources that will be affected by the Proposed Project, the position of public agencies on those resources (including any necessary regulatory process), and present a plan to minimize the adverse impact of the Proposed Project.

9. INFRASTRUCTURE SYSTEMS COMPONENT

The DPIR must include an infrastructure impact analysis.

The discussion of Proposed Project impacts on infrastructure systems should be organized system-by-system as suggested below. The DPIR must include an evaluation of the Proposed Project's impact on the capacity and adequacy of existing water, sewerage, energy (including gas and steam), and electrical communications (including telephone, fire alarm, computer, cable, etc.) utility systems, and the need reasonably attributable to the Proposed Project for additional systems or facilities. Thorough consultation with the planners and engineers of

the utilities will be required, and should be referenced in the Infrastructure Component section.

Any system upgrading or connection requiring a significant public or utility investment, creating a significant disruption in vehicular or pedestrian circulation, or affecting any public or neighborhood park or streetscape improvements, constitutes an impact which must be mitigated.

- **Water and Sewer.** Provide the following information on the Proposed Project's impact on water and sewer infrastructure and on water quality. As appropriate, this information can be integrated with the sustainability sections of the IMP Amendment and the DPIR.
  - Estimated water consumption and sewage generation from the Proposed Project and the basis for each estimate. Include separate calculations for air conditioning system make-up water.
  - Description of the capacity and adequacy of water, sewer, and storm drain systems and an evaluation of the impacts of the Proposed Project on those systems.
  - Description of the Proposed Project's impacts on the water quality of Boston Harbor or other water bodies that could be affected by the project, if applicable.
  - Description of mitigation measures to reduce or eliminate impacts on water quality.
  - Description of impact of on-site storm drainage on water quality; if this is described more fully in another section, reference that analysis here.
  - Detail methods of protection proposed for infrastructure conduits and other artifacts, including BSWC sewer lines and water mains, during construction.
  - Detail the energy source of the interior space heating; how obtained, and, if applicable, plans for reuse of condensate.
  - Identification of measures to conserve resources, including any provisions for water recycling.

- **Energy Systems.** The DPIR should discuss the Proposed Project's approach to energy systems and conservation. As appropriate, this information can be integrated with the sustainability sections of the IMP Amendment and the DPIR. The discussion should include at a minimum the following:
  - Description of all energy (heat, electrical, cooling, etc.) requirements of the project and evaluation of the Proposed Project's impacts on resources and supply.
  - Description of measures to conserve energy usage and consideration of the feasibility of including solar energy provisions or other on-site energy provisions.

- **Other Systems.** The DPIR should also discuss emergency systems, gas, steam, optic fiber, cable, and any other systems impacted by the Proposed Project. The location of transformer and other vaults required for electrical distribution or ventilation must be chosen to minimize disruption to pedestrian paths and public improvements both when operating normally and when being serviced, and must be described.

10. BROADBAND READY BUILDINGS QUESTIONNAIRE

As part of the DPIR, the Proponent must include a completed Article 80 Broadband Ready Buildings Questionnaire, attached as Appendix 4. The information that is shared through the Broadband Ready Buildings Questionnaire will help the BPDA and the City understand how developers currently integrate telecommunications planning in their work and how this integration can be most responsive to a changing technological landscape.

11. OTHER

- **Public Notice.** BU will be responsible for preparing and publishing in one or more newspapers of general circulation in the city of Boston a Public Notice of the submission of the DPIR to the BPDA as required by Section 80A-2. This Notice shall be published within five (5) days after the receipt of the DPIR by the BPDA. In accordance with Article 80, public comments on the DPIR shall be transmitted to the BPDA within forty-five (45) days of the publication of this notice. A sample form of the Public Notice is attached as Appendix 3. Following publication of the Public Notice, BU shall submit to the BPDA a copy of the published Notice together with the date of publication.

MEMORANDUM

TO: **Tim Czerwienski, Project Manager**
FROM: **BPDA Staff**
DATE: **November 30, 2018**
SUBJECT: **BPDA Planning Division Staff Comments on Boston University Data Sciences Center Project Notification Form**

The proposed Data Sciences Center is located at the corner of Commonwealth Avenue and Granby Street in the Boston University (BU) urban campus. It is also adjacent to the Bay State Road/Back Bay West Architectural Conservation District. The building site was identified as a Proposed Institutional Project in the 2013 Institutional Master Plan (IMP), which outlined the development of a building or buildings of up to 350,000 GSF with a maximum floor area ratio of 8.4 and a maximum height of 15 stories at 225 feet. The Data Sciences Center is currently proposed at 350,000 GSF and 19 stories at 305 feet. The use will be a mixed academic program of computer science, mathematics & statistics, the Hariri Institute, and classrooms, consistent with the uses outlined in the IMP. No below grade parking will be provided.

The proposed academic building represents a vastly more appropriate urban use than the current surface parking lot, and we look forward to continuing to work together to advance the building's design and its relationship with the urban fabric. It should also be added that we appreciate that the University is making an attempt to create a building that embodies the bold architecture that this administration has showed an enthusiasm for.

In response to these comments, a Draft Project Impact Report (DPIR) should be submitted providing additional information for the evaluation of the proposal. Details of submission requirements are outlined in this memorandum. Responses should be specific and graphic, as opposed to textual, when possible.

URBAN DESIGN COMPONENT

Note that the Boston Civic Design Commission (BCDC) has only begun its review of this project, and voted to send the project to Design Committee at their monthly meeting on

December 4, 2018 (the draft minutes are included below). Further comments will be forwarded to the proponent as they become available.

Issues that should be addressed in the DPIR and continuing design review include those raised in our meetings, as well as the following:

- Contextually-grounded creativity is a key design tool that the BPDA staff looks for in new projects. Based on the three design meetings we have had to this point, the strong initial ideas about the building will benefit from a thoughtful assessment of the physical context of the campus and city and how the building is adding to that context, making the campus and city better. 1
- Toward that end, provide graphic documentation and analysis of the existing site of the project. This should include the neighborhood context, site patterning (figure ground), open space, vegetation, and water bodies. Beyond showing these elements (much of which is included in the PNF), include analysis diagrams that show how the project specifically responds to the site and the surrounding contextual fabric of the city. It is anticipated that this analysis may impact the design of the building, particularly at the lower levels, where it directly meets the public realm. 2
- To the west of Granby Street, the BU campus has its most defined character of purpose built, buff masonry and concrete structures with a consistent relationship to the street. Analyze, in diagram form, how the project will relate to both this formal part of the campus and the different character represented to the east, where existing and purpose built structures have a variety of relationships to the existing context and take on more of a red brick character. How does this analysis inform the design of a project located between these two different parts of the campus? 3
- Provide multiple site sections in both directions extending beyond the site at least to the curb on the opposite side of the adjacent street. Ideally, some sections should go further than this into the mass of nearby buildings. These should be used to help explain the relationship of the building to the smaller scale along Bay State Road and the larger scale of the campus buildings across the width of Commonwealth Avenue. 4
- Provide context elevations of the building extending beyond the project for at least a block and preferably further in each direction. How does the project relate to its neighbors, as shown in elevation, and particularly along the public facing streets? This may be done in drawings or a combination of drawing and photorealistic context. 5
- Provide a diagram showing how the proposed height relates to other tall buildings on BU's campus and in the context of the surrounding neighborhoods. 6

- Provide massing diagrams for potential ways to add to the building in the event that additions may be needed in the future. 7
- The effect of the intended 'iconic' silhouette of the proposed offset, stacked-floor tower, as seen from the Charles River, is challenged by the existing Warren Towers that seem to bookend (and crowd) it as they stand in the background. Look at alternate locations for the tower that might make this reading clearer (*i.e.*, is the relationship stronger if the tower is on the east side of the site?). 8
- The primary design move of the building is the stacked offset tower. The strength of this reading is undermined by the facade strategy of mixed materials spiraling around the tower. The spiral may be the best option, but that is not immediately apparent. Provide several alternate facade studies that look at ways to reinforce the design of the tower. Look at alternatives that might respond to the environment, to a sense of verticality, or might spiral in a more subtle way. As was mentioned at the initial meeting, it is not clear that red terra cotta is the best option in this location; a graphic design case should be presented. 9
- Currently there is a material relationship between the base and tower. Provide options for either a stronger, designed relationship or a more distinct one. While the current approach may be most appropriate, it would be useful to understand if a strategy that has a base building and tower or a tower that comes down to the ground might be more appropriate on this site. 10
- The main facade faces south. One of the design propositions is that the base of the building will be very transparent. How will this be achieved on a south face, where the most intensive intervention will be needed on the glazing? Will the overhangs provide sufficient shadow to allow the use of a more visually transparent glass? If not, what other strategies are planned? 11

The stated objective of extending the public realm into the ground floor is a noble one, but would benefit from further study, as highlighted below:

- As proposed, the project sits forward of existing buildings to either side on Commonwealth Avenue, yet the building does not present any direct entry onto the street. Where entries are proposed, they either address Granby Street or are recessed into the building under a deep overhang, and are positioned at the very ends of the building podium. Explain the rationale behind this strategy. 12
- Most of the proposed exterior spaces that would be open and available to the public are positioned in locations either under the building's overhangs or where the building's mass will cast them in shade. Look at options, for example along Granby Street, where more of the public realm can be open to the sky. 13

- The proposed sidewalk along Commonwealth Avenue abuts the building's curtain wall, so that the public walking by the building can see the activity inside, but the expanded sidewalk is either not useable (because of the angle of the descending feature stair expressed on the building facade) or seems to be devoid of any proposed program that would invite the public to participate in the activation of the building. The relationship of the proposed building to Commonwealth Avenue is key to the success of the building as part of the city. Creation of a lively public realm across the frontage would greatly contribute to the Commonwealth Avenue corridor (and provide some public space with sun exposure, particularly in the fall, winter and spring seasons). 14
- The Granby Streetscape, despite being expanded to create additional width to accommodate a furnishing zone, seems to be negatively affected by the heft of the proposed overhang and massing of the building that currently extends all the way to the property line. Here, too, the proposed exterior program along Granby Street is confined to the northernmost portion of sidewalk created under the overhang, and held back from the intersection with Commonwealth Avenue. The exterior program should extend to the corner and wrap around to populate the Commonwealth Avenue street elevation, to whatever point can provide for a comfortable height under the descending interior stairway. 15
- The angle of the descending space along the Commonwealth Avenue elevation extends at an acute angle all the way down to the ground plane and, subsequently, creates an exterior space that will be difficult to program and/or maintain as a part of the public realm. This area should be eliminated through an architectural resolution. 16
- A continuous row of street trees should be provided along Granby Street from Bay State Road to Commonwealth Avenue. 17

Excerpt from the draft BCDC Minutes, December 4, 2018 Monthly Meeting:

The **Boston University Data Sciences Center** was next on the agenda. Paul Rinaldi with Boston University. Marianne McKenna, Partner at KPMB. Data Sciences serves as a hub for the university's faculty and students. The face of the building aligns with adjacent building, as Commonwealth is a backbone of the campus.
Ken Greenberg: When we prepared this Master Plan in 2012, Consolidate the university in a dense, transit-oriented form. Speaks to the relationship of porosity and activity along Commonwealth Avenue.
Marianne McKenna: The stacked form shapes views from Kenmore Square and along Commonwealth Avenue. Because multiple departments utilize the building, development

of the plans fosters collaboration and connectivity. Fly-through video presented by Paulo Rocha, Principal at KPMB.
David Hacin: I was struck by the exciting approach to this project. Would like to understand from a more citywide perspective --from around town. I think BU will have this strong relationship between this building and the law school tower. The building remains fairly heavy at the top, and personally I wish it grew lighter. Exciting and dynamic building that ends in a blunt way.
Mikyoung Kim: I'd like to know if there are opportunities for inside/outside relationship, and the accessibility of the important axis. What is the relationship of all the landscape spaces with the canopy over them.
Deneen Crosby: Need to know more about the strategy for the open space--why is the courtyard plaza on the North side and not open to Commonwealth Ave. Would like the plaza on the front side to be a little more generous. Like seeing into the building.
Kirk Sykes: I think the transparency on Commonwealth Avenue is quite exciting. There are two typologies that may be interesting to look at in Design Committee: both how this fits into a mile-long linear campus, and the river in the context of the campus.
Anne-Marie Lubenau: How has this corridor evolved over time. Does this establish a precedent as a high spine, especially since this acts as a hub for the campus. How might this anticipate further development.
William Rawn: I would also if you've considered carving open space out along the Northwest corner of the site so that it would be next to a street, and more useful for the campus. At the northwest it might get at least afternoon sun. Many of us would support a bold style for the architecture in this new center for the campus. My question for discussion at committee: is this stacked volume design the right focus?
David Manfredi: I think the direction is marvelous. This is a move don't make five times on the campus, it's a move you make one bold time on the campus. Hope that the internal circulation is as important and connected to streetscape as it seems to be.

TRANSPORTATION

- With the proposed conversion of Granby to 2-way, interventions to ensure the prohibition of left turns from eastbound Commonwealth Ave need to be proposed 18
- Does Granby St need to be three lanes (2 lanes southbound, 1 lane northbound) from the "alley" to Comm. Ave? Current one-way condition provides 2 lanes southbound (one left turn and one right turn lane). This 19

would require adjustments to the curb line and modification to the building footprint.

- Refinements to the Silber Way and Comm. Ave pedestrian areas will be needed, including possibly providing additional dimension to meet Complete Streets and ADA accessibility standards. 20
- A "no parking" project that relies on alternative modes needs a robust TDM program, including: 21
    - Subsidized MBTA passes for employees (full subsidy of monthly "Link" passes?)
    - Subsidy for Blue Bikes membership for employees?
    - Sponsorship of an additional Blue Bikes Station
- BU should consider improvements to the existing Silber Way pedestrian overpass as off-site mitigation (new and better overpass? Improvements to conditions at the landings?) 22

SUSTAINABLE & RESILIENT DEVELOPMENT

Boston University continues to lead in climate impact mitigation and, with the Data Science Center, will be constructing the next generation of high performance green buildings. The iconic nature and scale of the building will visibly exemplify BU leadership and inspire both the BU community and BU's academic peers. As the building design work progresses BU should use the opportunity to elevate the university's sustainability and resiliency values and goals. 23

In coordination with ongoing Urban Design discussions, further study facade shading and articulation strategies including consideration of adjacent building shadows. 24

Article 37 Green Buildings

PERMITS AND APPROVALS

Please revise Table 1-1 Anticipated Project Permits and Approvals to include "Boston Interagency Green Building Committee" and "Article 37 Green Building compliance". 25

GREEN BUILDINGS

The PNF indicates the project will use the LEED v4 New Construction (NC) rating system and commits to achieving LEED Gold. The IGBC accepts the rating system selections and LEED commitment. As an expression of BU's leadership and values, the project team should target LEED Platinum. 26

Following are specific credits that the project team should give priority to achieving:

- Rainwater Management - include onsite retention and infiltration strategies (2 to 3 points). 27
- Optimized Energy Performance – include additional strategies for achieving a 30% or greater reduction in energy use (+3 to 8 points). 28
- Demand Response – include strategies for reducing energy loads in response to utility (+3 points). 29
- Renewable Energy Production - include solar PV (+1 to 3 points). 30
- Regional Priority – the project appears eligible for additional points (+1 to 2 points). 31

BU's 100% renewable electricity purchase is truly exemplary and supports Boston's Carbon Neutral 2050 GHG goal. Please include the following strategies for further reducing GHG emissions associated with the proposed building:

- Prioritize passive strategies such as improved building envelope performance by increasing building envelope air tightness and insulation. 32
- Reduce active building systems and sizes to reflect improved passive performance and ensure systems cost savings are fully captured. 33
- Include solar PV and provide system(s) location, size, and output information along with any related analysis. At minimum the buildings should be solar ready. 34
- Please include an Energy Model Summary and the LEED v4 Minimum Energy Performance Calculator worksheet in the DPIR filing. 35

CLIMATE RESILIENCY

- The Climate Resiliency Report included in the PNF is a WORKING DRAFT. On online version of the CR Checklist should be completed for the building types with the resulting PDF submitted with the DPIR filing. 36
- Please insure all the Climate Resiliency Checklist fields are completed. 37

ENVIRONMENTAL

- Wind Tunnel Analysis 38

  Please see attached wind sensor plan with added points for study. Additionally, provide a list of the BPDA approved projects and those under construction that were included in the wind tunnel analysis.
- Solar Glare: Additional details about solar glare shall be required : 39

- Solar Spot Glare: As the proponent has stated that “as the design progresses” different exteriors will be evaluated and thus shall be required to demonstrate that extensive areas of glazing, highly reflective glass or metal cladding, or areas of sloping glass will not be included in the design or conduct a solar glare analysis to determine visual impact or discomfort due to reflective spot glare. 40
- Solar Heat Buildup: Analysis of the potential for solar heat buildup in any nearby buildings receiving reflective sunlight 41

Boston Water and Sewer Commission

980 Harrison Avenue
Boston, MA 02119-2540
617-989-7000

October 31, 2018

Mr. Michael Rooney
Boston Planning & Development Agency
One City Hall Square
Boston, MA 02201

Re: Boston University Data Science Center PNF/IMPNF

Dear Mr. Rooney:

The Boston Water and Sewer Commission (Commission) has reviewed the Project Notification Form (PNF) and the Institutional Master Plan Notification Form (IMPNF) for the above referenced Project (Project), located at 665 Commonwealth Avenue, in the Fenway/Kenmore neighborhood of Boston. The Project consists of the construction of a new academic building to serve the departments and institutes focused on computational and data sciences in one centrally located building. Two existing departments and a research institute will move to the building from five different locations. The proposed site consists of two parcels which are currently occupied by a paved, at-grade public parking lot. The Project site is bordered by Commonwealth Avenue to the south; Granby Street to the west; University-owned multistory brick townhouses fronting Bay State Road to the north; and Boston University's College of Health and Rehabilitation Sciences building to the east.

Water, sewer, and storm drain service for the site is provided by the Boston Water and Sewer Commission.

For water service the Project site is served on Commonwealth Avenue by a 16-inch southern low pit cast iron water main which was installed in 1893 and rehabilitated in 1990; on Granby Street by an 8-inch southern low ductile iron cement lined water main installed in 2000; on Bay State Road by an 8-inch southern low cast iron cement lined main installed in 1958; and also on Bay State Road by an 8-inch southern low ductile iron cement line pipe installed in 2010. Water demand for the Project is estimated at 13,112 gallons per day (gpd). For water service the proponent proposes to connect to the water main located on Commonwealth Avenue and/or Granby Street.

For sewer service the Project site is served on Commonwealth Avenue by an 18-inch sewer main installed in 1894, and rehabilitated in 2008; on Granby Street by an 18-inch sewer installed in 2001; and on Bay State Road by an 18-inch sewer which was installed in 1999. Sewage generation from the Project is estimated at 11,920 gpd. For sewer service the proponent proposes to connect to the sewers on Commonwealth Avenue or Granby Street.

For drainage the Project site is served on Commonwealth Avenue by a 15-inch storm drain which was installed in 1999; a 12-inch storm drain on Granby Street which was installed in 1895 and rehabilitated in 1999; and by a 15-inch storm drain on Bay State Road installed in 2010. For drainage the proponent proposes to connect to storm drains on Granby Street and Commonwealth Avenue. The drains from the Project site ultimately discharge to the Charles River.

The Commission has the following comments regarding the proposed Project:

General

1. The Proponent must submit a site plan and General Service Application to the Commission for the proposed Project. Prior to the initial phase of the site plan development, the Proponent should meet with the Commission's Design and Engineering Customer Services to review water main, sewer and storm drainage system availability and potential upgrades that could impact the Project's development. 1

2. The site plan must show the location of both public and private water mains, sewers and drains serving the Project site, as well as the locations of existing and proposed service connections. 2

3. Any new or relocated water mains, sewers and storm drains must be designed and constructed at the Proponent's expense. They must be designed and constructed in conformance with the Commission's design standards, Water Distribution System and Sewer Use Regulations, and Requirements for Site Plans. 3

4. With the site plan the Proponent must provide detailed estimates for water demand (including water required for landscape irrigation), wastewater generation, and stormwater runoff for the Project. The Proponent should provide separate estimates of peak and continuous maximum water demand for retail, irrigation and air-conditioning make-up water for the Project. Estimates should be based on full-site build-out of the Project. 4

5. It is the Proponent's responsibility to evaluate the capacity of the water and sewer system serving the Project site to determine if the systems are adequate to meet future Project demands. With the site plan, the Proponent must include a detailed capacity analysis for the water and sewer systems serving the Project site, as well as an analysis of the impact the Project will have on the Commission's systems and the MWRA's systems overall. The analysis should identify specific measures that will be implemented to offset the impacts of the anticipated flows on the Commission and MWRA sewer systems. 5

6. Developers of projects involving disturbances of land of one acre or more are required to obtain an NPDES General Permit for Construction from the Environmental Protection Agency. The Proponent is responsible for determining if such a permit is required and for obtaining the permit. If such a permit is required for the proposed Project, a copy of the Notice of Intent and any pollution prevention plan submitted to EPA pursuant to the permit must be provided to the Commission's Engineering Services Department prior to the commencement of construction. 6

7. A Total Maximum Daily Load (TMDL) for Nutrients has been established for the Lower Charles River Watershed by the Massachusetts Department of Environmental Protection (DEP). In order to achieve the reductions in phosphorus loadings required by the TMDL phosphorus concentrations in stormwater discharges to the lower Charles River from Boston must be reduced by 64%. To ccomplish the necessary reductions in phosphorus the Commission requires developers of projects in the lower Charles River watershed to infiltrate stormwater discharging from impervious areas in accordance with DEP requirements. With the site plan the Proponent must submit a phosphorus reduction plan for the Project. 7

8. The design of the Project must comply with the City of Boston's Complete Streets Initiative, which requires incorporation of "green infrastructure" into street designs. Green infrastructure includes 8

greenscapes, such as trees, shrubs, grasses and other landscape plantings, as well as rain gardens and vegetative swales, infiltration basins, and paving materials and permeable surfaces. The proponent must develop a maintenance plan for the proposed green infrastructure. For more information on the Complete Streets Initiative see the City's website at http://bostoncompletestreets.org/

9. Before the Proponent demolishes any existing structures the existing water, sewer and drain connections that won't be re-used must be cut and capped in accordance with Commission standards. The Proponent must complete a Termination Verification Approval Form for a Demolition Permit, available from the Commission. The completed form must be submitted to the City of Boston's Inspectional Services Department before a Demolition Permit will be issued. 9

Sewage/Drainage

10. The Department of Environmental Protection (DEP), in cooperation with the Massachusetts Water Resources Authority (MWRA) and its member communities are implementing a coordinated approach to flow control in the MWRA regional wastewater system, particularly the removal of extraneous clean water (e.g., infiltration/ inflow ("I/I")) in the system. Pursuant to the policy new developments with design flow exceeding 15,000 gpd of wastewater are subject to the Department of Environmental Protection's regulation 314 CMR 12.00, section 12.04(2)(d). This regulation requires all new sewer connections with design flows exceeding 15,000 gpd to mitigate the impacts of the development by removing four gallons of infiltration and inflow (I/I) for each new gallon of wastewater flow added. The Commission will require the Proponent to develop an inflow reduction plan consistent with the regulation. The 4:1 reduction should be addressed at least 90 days prior to activation of water service, and will be based on the estimated sewage generation provided with the Project site plan. 10

11. Oil traps are required on drainage systems discharging from enclosed parking garages. Discharges from the oil traps must be directed to a building sewer and must not be mixed with roof or other surface runoff. The requirements for oil traps are provided in the Commission's Requirements for Site Plans. 11

12. Grease traps will be required in any food service facility in the new development in accordance with the Commission's Sewer Use Regulations. The proponent is advised to consult with the Commission before preparing plans for food service facilities. 12

13. Sanitary sewage must be kept separate from stormwater and separate sanitary sewer and storm drain service connections must be provided. The Commission requires that existing stormwater and sanitary sewer service connections, if any are to be re-used by the Project, be dye tested to confirm they are connected to the appropriate system. 13

14. The discharge of dewatering drainage to a sanitary sewer is prohibited by the Commission and the MWRA. The discharge of any dewatering drainage to the storm drainage system requires a Drainage Discharge Permit from the Commission. If the dewatering drainage is contaminated with petroleum products for example, the Proponent will be required to obtain a Remediation General Permit from the EPA for the discharge. 14

15. The site plan must show in detail how drainage from the building's roof top and from other impervious areas will be managed. Roof runoff and other stormwater runoff must be conveyed separately from sanitary waste at all times. 15

16. The Project is located within Boston's Goundwater Conservation Overlay District (GCOD). The district is intended to promote the restoration of groundwater levels and reduce the impact of surface runoff. Projects constructed within the GCOD are required to include provisions for retaining stormwater and directing the stormwater towards the groundwater table for recharge. 16

17. The Proponent must fully investigate methods for infiltrating stormwater on-site before the Commission will consider a request to discharge stormwater to the Commission's system. A feasibility assessment for infiltrating stormwater on-site must be submitted with the site plan for the Project 17

18. The Massachusetts Department of Environmental Protection (MassDEP) has established Performance Standards for Stormwater Management. The Standards address stormwater quality, quantity and recharge. In addition to Commission standards, the proposed Project will be required to meet MassDEP's Stormwater Management Standards. 18

19. In conjunction with the site plan and General Service Application the Proponent will be required to submit a Stormwater Pollution Prevention Plan. The plan must: 19

    - Specifically identify how the Project will comply with the Department of Environmental Protection's Performance Standards for Stormwater Management both during construction and after construction is complete.

    - Identify specific best management measures for controlling erosion and preventing the discharge of sediment, contaminated stormwater or construction debris to the Commission's drainage system when construction is underway.

    - Include a site map which shows, at a minimum, existing drainage patterns and areas used for storage or treatment of contaminated soils, groundwater or stormwater, and the location of major control or treatment structures to be utilized during construction.

20. The Commission requests that the Proponent install a permanent casting stating: "Don't Dump: Drains to Charles River" next to any new catch basin installed as part of the Project. The Proponent may contact the Commission's Operations Division for information regarding the purchase of the castings. 20

21. The Commission encourages the Proponent to explore additional opportunities for protecting stormwater quality by minimizing sanding and the use of deicing chemicals, pesticides and fertilizers. 21

Water

22. The Proponent is required to obtain a Hydrant Permit for use of any hydrant during construction of the Project. The water used from the hydrant must be metered. The Proponent should contact the Commission's Operations Department for information on obtaining a Hydrant Permit. 22

23. The Commission utilizes a Fixed Radio Meter Reading System to obtain water meter readings. Where a new water meter is needed, the Commission will provide a Meter Transmitter Unit (MTU) and connect the device to the meter. For information regarding the installation of MTUs, the Proponent should contact the Commission's Meter Installation Department. 23

24. The Proponent should explore opportunities for implementing water conservation measures in addition to those required by the State Plumbing Code. In particular the Proponent should consider indoor and outdoor landscaping which requires minimal use of water to maintain. If the Proponent 24

plans to install in-ground sprinkler systems, the Commission recommends that timers, soil moisture indicators and rainfall sensors be installed. The use of sensor-operated faucets and toilets in common areas of buildings should also be considered.

Thank you for the opportunity to comment on this Project.

Yours truly,

John P. Sullivan, P.E.
Chief Engineer and Operations Officer

JPS/as
cc: Gary Nicksa, Senior Vice President, Boston University
Katherine Ronan, Mass. Water Resources Authority
Maura Zlody, Boston Environment Department
Mike Nelson, Boston Water and Sewer Commission
Phil Larocque, Boston Water and Sewer Commission

Boston University
Community Task Force
P.O. Box 15735
Boston, Massachusetts 02215

October 31, 2018

Boston Redevelopment Authority Board
One City Hall Square – 9th Floor
Boston, MA 02201

Dear Michael Rooney:

As the chairperson of the Boston University Community Task Force I am writing in support of the proposed Boston University Data Sciences Center to be located at 665 Commonwealth Ave and the digital sign package proposed for exterior of 700 Commonwealth Ave (Warren Towers) .

Boston University and the task force members met on September 26th prior to filing the project with the BPDA. On October 23 many of the members of the Task Force attended the BPDA public meeting and then met again the following evening of October 24th.

During the task force meeting the members present expressed a desire to see this project move forward and asked that I convey this in writing to you.

The Boston University Community Task Force looks forward to continuing to work with you on this project as it moves forward.

Sincerely,

Pamela Beale

Pamela G. Beale
Chairperson

cc: Tim Czerwienski

Comment: Created Date	First Name	Last Name	Organization	Opinion	Comments
10/23/2018	Brian	Sandford		Oppose	I would have liked to present these comments at the meeting on 10/23/18, but cannot attend. I write as an aspiring architect and recent graduate of Wentworth Institute of Technology, and someone who has spent a significant amount of time on and around the BU Campus. I want to make clear I am not fundamentally opposed to the University growing, it is well within their right. It is nice to see a proposal for what is now an underutilized site along Commonwealth Avenue. I am also not fundamentally opposed to the University building at the scale of the proposed building. It adds nice density and a counterpoint on the overall skyline. Overall, I support the ambition behind this project. What I am fundamentally opposed to is bad design. The proposed building is bad design. 1 It's overall massing, with a 5 story podium and shifted cube tower, is uninspired, outdated, and completely blind to it's surrounding context. The sun studies provided in the PNF show how much shadow the proposed building would cast, cloaking wide swathes of Bay State Road and the Esplanade. The facades are incoherent and ill-considered, with the red metal screens appearing and disappearing seemingly at random. Despite some attempt to suggest potential louvres or sun shades, the form in general does not seem to respond at all to solar or environmental conditions. It is deeply disingenuous to aim for a LEED-certified Gold building with a South facing facade primarily sheathed in glass, even if that glass is triple-glazed. One of the few valuable pieces of the proposed design is the first and second floor elevations along Commonwealth Avenue. The ramping floor, butterfly stair, and general translucency has the potential to provide a lively view to passers-by. While the PNF claims that the spaces created by overhangs would create places for seating, I would push the design team to develop this experience further, creating truly human-scale spaces to be occupied and enjoyed, not merely walked or biked past. Figure 3-5, on page 74, is the best demonstration of my multitude of concerns. The massing 2 3
					is random and widely out-of-scale, appearing so large that even the behemoth of Warren Towers looks diminutive in comparison. The materiality is lacking any unity or coherence. The overall proportion seems heavy, ungainly, and nowhere near pleasing to the eye, especially next to the slim, solid Law Tower to the west. I appreciate the time, effort, and expense put forward by the University, the architects and planners, and the entire design team. However, this building will be visible by thousands of people a day, impacting the urban life of students, neighborhood residents, and many more Bostonians. Much more care and thought needs to be expended to create an elegant design that will be a strong contributor to the city for decades to come. I look forward to seeing revisions at further public meetings. 4

Comment: Created Date	First Name	Last Name	Organization	Opinion	Comments
10/23/2018	Sam	Burgess	BU Graduate Student	Support	I support this project. I find it a bold new addition to the Comm Ave skyline and a welcome contrast to the Warren Towers across the street. It's great that this project replaces a surface parking lot, making more productive use of the parcel and ideally reducing the number of SOV trips in the area. Secure bike parking on-site is welcome and a must given the high-rate of bicycle theft and vandalism on BU's campus. The proposed changes to Granby Street also look great - removing street parking and converting into two directions from a one way while adding bike lanes. Importantly, as Granby St. is a city street, I urge the project team to work with BTD in installing flexposts or bollards in the newly-installed bike lanes. This would be in line with MassDOT's Comm Ave work and build-out of protected bike lanes between the BU Bridge and Packard's Corner. They are cheap, easy to install, and will cause minimum disruption given that Granby will no longer have street parking. More importantly, they prevent cars from parking or otherwise obstructing the bike lane - an all too common problem on the current unprotected lanes on Comm Ave. The whole area in general is still very dangerous for cyclists, and protected infra should be a design must for any new streetscape improvements. Thank you for your consideration.
10/24/2018	Sydney	Ellis		Oppose	This would be a monstrous addition to Comm Ave. First of all, the size is ridiculous and it will destroy the open feel of the street as it overlooks the river. It is also hideous and would destroy the cohesive and enjoyable walk down Comm Ave.
10/28/2018	Christian	Cole	Boston University	Neutral	I think the podium needs to be knit a little better with the street and the diagonal cladding needs to be taken off the surfaces that'll have the best views. Who wants to have a view of the city tainted by diagonal lines?
10/8/2018	Karen	Heffernan		Oppose	What an eyesore. Please please please do not make this building a reality. It will detract from this neighborhood.
10/8/2018	Dianna	Carney		Support	I love the new concept, I think it adds an interesting and fun look to the Boston sky rise. Boston though rich with tradition is also a place of innovation. I think this building concept reflects just that.
10/8/2018	Merrill	Bloor		Oppose	Ugly, out of character for the city and just plain heinous.
10/8/2018	Larry	Ouellette		Oppose	The building as designed is simply one of the ugliest building designs I've ever seen. The brown elements look so out of place. The large number of offsets also looks very bad. Time for "Stack of Books" version 2.
10/9/2018	Steve	Appell	Boston resident	Oppose	A terrible design that will create an eye sore Keep these designs in Canada , not Boston Who?s political favor is being paid off with this firm ?

5

6

Comment: Created Date	First Name	Last Name	Organization	Opinion	Comments
10/19/2018	Jonathan	Rodrigues		Oppose	As a taxpayer in Boston, I hope the city will consider holding this project contingent upon assurances that BU pay their Payment in Lieu of Taxes (PILOT) contributions in full. While they are relatively good compared to other institutional actors, there is still millions left unpaid that BU should be contributing for the good of all our students in families in BPS and other city services. We hope the City may hold this consideration.
10/16/2018	Diane	Brown	Boston Resident	Oppose	It's ugly. I don't like the design. It's not aesthetically pleasing at all. The height is all wrong. The height should be the same as the building next to it. It is completely out of character with Boston. It is grotesque.

Appendix A: Scoping Determination and Responses to Comments on the Project Notification Form

Agency Comment Letters

Letter 1	BPDA Staff: November 30, 2018
Letter 2	John Sullivan, Boston Water and Sewer Commission: October 31, 2018

General Public Comment Letters

Letter 3	Pamela Beale, Boston University Community Task Force: October 31, 2018
Letter 4	Comments Received on BostonPlans.org: various individuals and dates

Letter #1 Comment #	BPDA Staff: November 30, 2018
1	**Context:** In addition to multiple graphic materials and presentations provided at design-focused meetings, the DPIR includes a thorough discussion of the physical context of the campus and city in Chapter 2.0, Project Summary and 3.0, Urban Design. See Sections 2.1, 3.3, and 3.4.
2	**Project Site:** Graphic documentation with depicts the existing Site can be found in Figures 2-1 through 2-5, and Figures 3-1 and 3-2. Graphic documentation depicting the proposed site features including the relationship of the building to the public realm and ground plane can be found in Figures 2-33, 2-34, 3-3, 3-8 through 3-13, and Figure 3-16 through 3-23.
3	**Campus design**: Formal and color relationships between the building and campus buildings are described in Chapter 3.0, Urban Design and depicted in Figures 3-3 and 3-7.
4	**Sections:** Site (cross) sections are provided in Figures 3-25 through 3-29.
5	**Elevations:** Context elevations are provided in Figure 3-7.
6	**Height:** A diagram and photos depicting how the proposed building height relates to other tall buildings on the Boston University campus can be found in Figures 3-7 and 3-24.
7	**Massing:** A massing diagram depicting a potential Phase II addition to the building is provided in Figure 3-15.
8	**Tower location**: The relationship between the building and Warren Towers is such that the proposed tower will be sufficiently distanced from those structures by the width of Commonwealth Avenue, and not visually aligned with the masses of the three towers in many of the key viewsheds. The Proponent has studied alternative tower locations which do not respond well to either programming or the desired urban design feature of a tower mass anchoring the corner/intersection of Granby Street and Commonwealth Avenue. See Figures 3-3, 3-11, 3-12 and 3-24.
9	**Massing/Alignment**: The building massing and alignment is discussed in Chapter 3.0, Urban Design. The Proponent has discussed the building alignment and rotation and has provided several alternative façade studies and color variations at design-focused meetings. These discussions are ongoing.
10	**Relationship between base and tower**: The Proponent has discussed the building base and tower relationships and has provided several studies and supporting graphics at design-focused meetings. These discussions are ongoing.
11	**South-facing façade:** The base of the building is provided with metal louvers to mitigate impacts of southern exposure. These louvers have been more widely spaced over a large area, and the ground floor is recessed beneath the upper floors to provide shading and transparency. See Figures 3-16, 3-17, 3-18, 3-19 and 3-20.

12	**Entrance**: As part of the design development work subsequent to the filing of the PNF, the Proponent moved the location of the building off of Commonwealth Avenue and Granby Street property boundaries to improve the relationship with the street, and has also relocated building entrances to Commonwealth Avenue. See Figure 3-21.
13	**Public realm/open to sky**: The Proponent has further developed the landscape design to accommodate shade conditions around the building, and also to reconfigure and improve the open space at Granby Street and Bay State Road, which is not directly in shade. A discussion of the landscape treatment and public realm is found in Chapter 2.0, Section 2.6, Chapter 3.0 Urban Design, Section 3.8, and depicted in Figures 3-21 through 3-23, Figure 3-30 and 3-31.
14	**Public realm**: See Response #13. The Proponent has been advancing the design of the public realm, and the area where the building ends in an angle descending to the ground. The Proponent will continue to provide updated materials at design-focused meetings. See Figure 3-16, 3-17, 3-18 and 3-19.
15	**Granby Street:** The design of the streetscape along Granby Street has been advanced since the filing of the PNF to include additional program elements. The overhang is at sufficient height and distance from the property boundary to reduce or eliminate visual impressions of heaviness or "heft." The program elements have been extended along Commonwealth Avenue. See Figure 3-16, 3-17, 3-18 and 3-19.
16	**Design/Comm Ave**: See Responses #13 and 14.
17	**Street trees:** A continuous row of street trees has been provided along Granby Street.
18	**Granby/left turns**: Signage will be provided to preclude left turns onto Granby Street from Commonwealth Avenue. See Chapter 5, Transportation Section 5.5.
19	**Granby**: Granby Street will accommodate two-way traffic with two lanes. See Chapter 5.0 Transportation, Section 5.5, Table 5-7 and Table 5-8.
20	**Silber/Comm Ave**: The Proponent has made improvements to pedestrian areas along Commonwealth Avenue and Silber way, and does not believe that additional improvements will be needed.
21	**TDM:** Boston University has adopted robust TDM initiatives. These are described in Chapter 5.0 Transportation, Section 5.7.1.
22	**Silber Way overpass**: The Proponent has made improvements to pedestrian areas and connections along Commonwealth Avenue and Silber way, and does not believe that additional improvements will be needed.
23	**Climate Impact Mitigation**: Boston University continues to demonstrate leadership in climate impact mitigation. See Chapter 4.0, Sustainability and Chapter 6.0 Environmental.
24	**Façade Shading and Articulation**: The Proponent continues to study and refine these elements of the Project.
25	Article 37 Permit table: These elements have been included in the DPIR. See Chapter 1.0 Project Summary, Section 1.8.6 and Table 1-1.
26	**LEED:** See Chapter 4.0 Sustainability, Section 4.2
27	**LEED:** See Chapter 4.0 Sustainability, Section 4.2

28	**LEED**: See Chapter 4.0 Sustainability, Section 4.2
29	**LEED**: See Chapter 4.0 Sustainability, Section 4.2
30	**LEED**: See Chapter 4.0 Sustainability, Section 4.2
31	**LEED**: See Chapter 4.0 Sustainability, Section 4.2
32	**Building Envelope:** The elements have been incorporated into the Project.
33	**Building systems:** The elements have been incorporated into the Project.
34	**Solar PV:** The Proponent is advancing a campus-wide solar energy program. See Chapter 4:0 Sustainability.
35	**Energy Model:** These have been included in Appendix F- Energy Model
36	**Climate Checklist:** This information has been provided in Appendix C – Climate Resiliency Checklist.
37	**Climate Checklist**: This information has been provided in Appendix C – Climate Resiliency Checklist.
38	**Wind:** This information has been provided in Chapter 6:0 Environmental and in Appendix G – Wind Impact Assessment.
39	**Solar Glare**: This information has been provided in Chapter 6:0 Environmental Section 6.6.
40	**Solar Glare**: This information has been provided in Chapter 6:0 Environmental Section 6.6.
41	**Solar Heat**: This information has been provided in Chapter 6:0 Environmental Section 6.6.

Letter #2 Comment #	John Sullivan, Boston Water and Sewer Commission: October 31, 2018
1	**Site plan/process**: The Proponent will comply with this request during the permitting phase of the Project.
2	**Site plan**: The Proponent will comply with this request during the permitting phase of the Project.
3	**New infrastructure**: The Proponent will comply with this request during the permitting phase of the Project.
4	**Water demand**: This information is provided in Chapter 7.0 Infrastructure.
5	**Capacity**: This information is provided in Chapter 7.0 Infrastructure.
6	**NPDES**: The Proponent will comply with this request during the permitting phase of the Project.
7	**TMDL**: The Proponent will comply with this request during the permitting phase of the Project.
8	**Complete Streets**: The Proponent will comply with this request during the permitting phase of the Project.
9	**Cut/cap**: The Proponent will comply with this request during the permitting phase of the Project.
10	**I/I**: Design flows do not exceed 15,000 gpd of wastewater.
11	**Oil traps**: The Project does not include enclosed parking garages.
12	**Grease traps:** The Project will not include a food service facility.
13	**Sewage:** The Proponent will comply with this request during the permitting phase of the Project
14	**Dewatering:** The Proponent will comply with this request during the permitting phase of the Project.
15	**Roof runoff:** The Proponent will comply with this request during the permitting phase of the Project.
16	**GCOD:** The Proponent will comply with this request during the permitting phase of the Project.
17	**Stormwater:** The Proponent will comply with this request during the permitting phase of the Project. See Chapter 7.0, Section 7.4.4.
18	**DEP performance standards:** The Proponent will comply with this request during the permitting phase of the Project. See Chapter 7.0, Section 7.4.4.
19	**SWPPP:** The Proponent will comply with this request during the permitting phase of the Project.
20	**Don't Dump plaques:** The Proponent will comply with this request during the permitting phase of the Project.
21	**Reduce use of certain materials:** The Proponent will comply with this request during the permitting phase of the Project.

22	**Hydrant permit:** The Proponent will comply with this request during the permitting phase of the Project.
23	**Water meters:** The Proponent will comply with this request during the permitting phase of the Project.
24	**Water conservation:** The Proponent has considered these measures will comply with this request during the permitting phase of the Project.

Letter #3	Pamela Beale, Boston University Community Task Force: October 31, 2018
	No responses required. The Proponent thanks the Boston University Community Force members and members of the public for their participation.

Letter 4	Comments Received on BostonPlans.org: various individuals and dates
1	**Design:** The perception of and reaction to architectural design is subjective, and therefore the Proponent understands that not all comments regarding design will be positive. These disparate views are appreciated. For further description of the design rationale, see Chapter 3:0 Urban Design.
2	**Shading/façade:** The Project has been designed to minimize shadow on public streets and open spaces and is also designed to achieve. LEED Gold Certification at a minimum. The fins and louvers and offset floor pates serve to provide shade and to minimize heat gain on the south façade. See Chapter 4:0 Sustainability.
3	**Public realm:** The design of the areas under the overhangs has been advanced as suggested by the commenter. See Chapter 2:0 Project Description and Chapter 3:0 Urban Design.
4	**Design:** See Response #1.
5	**Transportation:** The Proponent is working with BTD to develop the optimal bicycle lane configurations for Granby Street.
6	**Design/podium:** The Proponent has advanced the design of the podium levels to address these concerns. See Chapter 2:0 Project Description and Chapter 3:0 Urban Design.
7	**PILOT:** The Proponent continues to contribute PILOT payments and other funds and services to the City of Boston as required and agreed upon.
8	**Height:** The height of the building is in line with others on-campus and in the vicinity. See Chapter 3:0 Urban Design, Figure 3-7, Context Elevations.

Appendix B

LEGAL DESCRIPTION

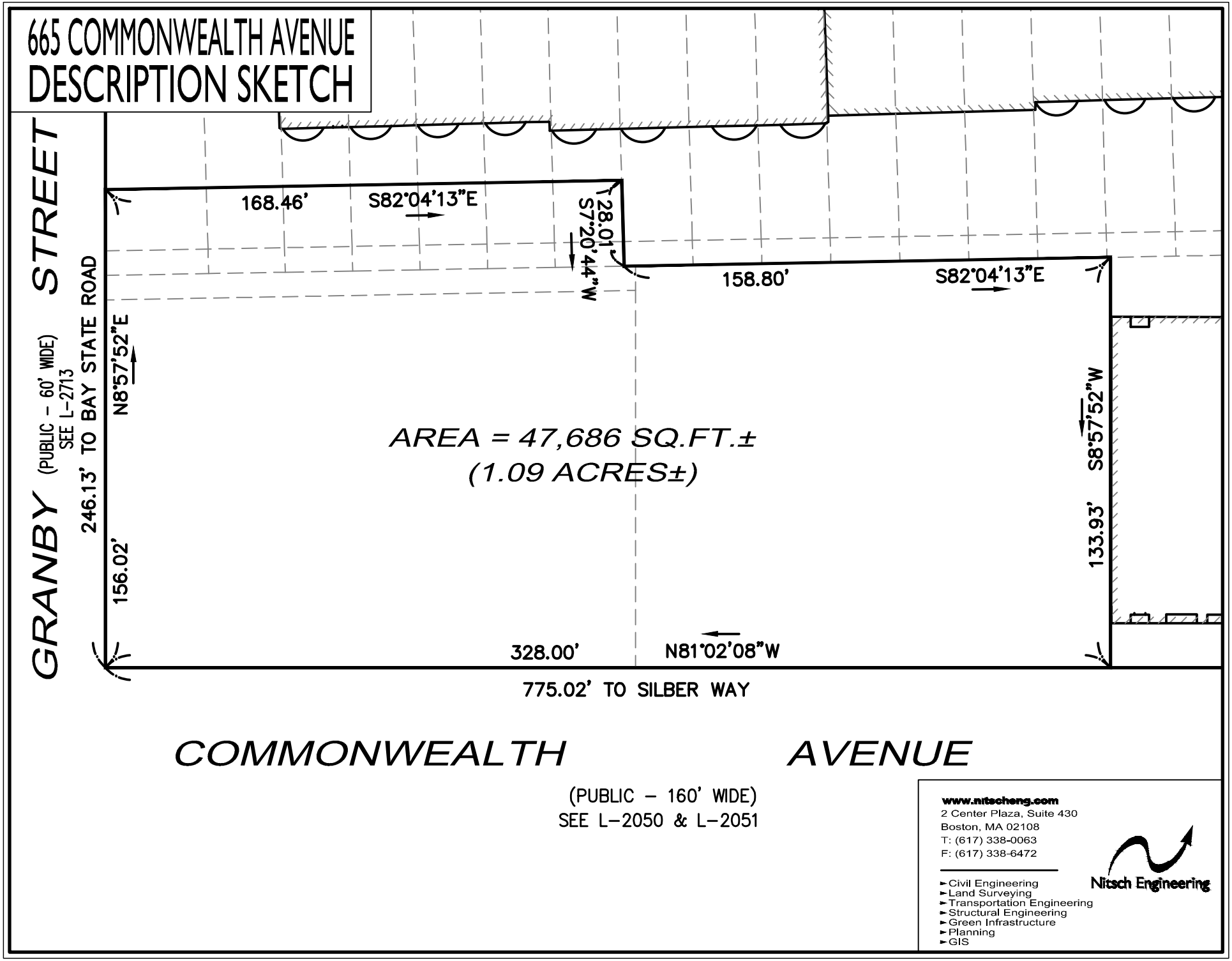
665 COMMONWEALTH AVENUE DESCRIPTION

BEGINNING AT THE INTERSECTION OF THE NORTHERLY RIGHT OF WAY LINE OF COMMONWEALTH AVENUE AND THE EASTERLY RIGHT OF WAY LINE OF GRANBY STREET;

THENCE N8°57’52”E	ALONG THE EASTERLY RIGHT OF WAY LINE OF GRANBY STREET, A DISTANCE OF 156.02 FEET TO A POINT;
THENCE S82°04’13”E	A DISTANCE OF 168.46 FEET TO A POINT;
THENCE S7°20’44”W	A DISTANCE OF 28.01 FEET TO A POINT;
THENCE S82°04’13”E	A DISTANCE OF 158.80 FEET TO A POINT;
THENCE S8°57’52”W	A DISTANCE OF 133.93 FEET TO A POINT;
THENCE N81°02’08”W	ALONG THE NORTHERLY RIGHT OF WAY LINE OF COMMONWEALTH AVENUE, A DISTANCE OF 328.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 47,686 SQUARE FEET MORE OR LESS OR 1.09 ACRES MORE OR LESS OF LAND.

665 COMMONWEALTH AVENUE
DESCRIPTION SKETCH



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Appendix C

CLIMATE RESILIENCY CHECKLIST

boston planning & development agency

Climate Resiliency Checklist

NOT FOR FILING

NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

A.1 - Project Information

Project Name:	Boston University Data Sciences Center			
Project Address:	665 Commonwealth Avenue			
Project Address Additional:	645 Commonwealth Avenue			
Filing Type (*select*)	***Initial*** *(PNF, EPNF, NPC* ***DPIR*** *or other substantial filing)* *Design / Building Permit (prior to final design approval), or* *Construction / Certificate of Occupancy (post construction completion)*			
Filing Contact	*Judith Kohn*	*Fort Point Associates, Inc.*	*jkohn@fpa-inc.com*	*617-357-7044 x211*
Is MEPA approval required	*Yes/**no***		*Date N/A*	

A.2 - Project Team

Owner / Developer:	Trustees of Boston University
Architect:	KPMB Architects
Engineer:	Nitsch Engineering
Sustainability / LEED:	The Green Engineer
Permitting:	Fort Point Associates, Inc.
Construction Management:	Suffolk Construction

A.3 - Project Description and Design Conditions

List the principal Building Uses:	Academic offices and classrooms, meeting spaces, food service
List the First Floor Uses:	Academic offices and classrooms, meeting space
List any Critical Site Infrastructure and or Building Uses:	N/A

Site and Building:

Site Area:	*47,700 SF*	Building Area:	*305,000 SF gross*
Building Height:	*305 Ft*	Building Height:	*19 Stories*
Existing Site Elevation – Low:	*13.6 Ft BCB*	Existing Site Elevation – High:	*22.0 Ft BCB*
Proposed Site Elevation – Low:	*17.0 Ft BCB*	Proposed Site Elevation – High:	*21.25 Ft BCB*
Proposed First Floor Elevation:	*21.25 Ft BCB*	Below grade levels:	*2 Stories*

Article 37 Green Building:

LEED Version - Rating System:	LEED-NC v4	LEED Certification:	***Yes*** */ No*

Proposed LEED rating:	*Certified/Silver/* ***Gold****/Platinum*	Proposed LEED point score:	*68 Pts.*

Building Envelope

When reporting R values, differentiate between R discontinuous and R continuous. For example, use "R13" to show R13 discontinuous and use R10c.i. to show R10 continuous. When reporting U value, report total assembly U value including supports and structural elements.

Roof:	*R30c.i.(R)*	Exposed Floor:	*R30c.i.(R)*
Foundation Wall:	*R10c.i.(R)*	Slab Edge (at or below grade):	*R10c.i.(R)*

Vertical Above-grade Assemblies (%'s are of total vertical area and together should total 100%):

Area of Opaque Curtain Wall & Spandrel Assembly:	*41.4(%)*	Wall & Spandrel Assembly Value:	*0.259(U)*
Area of Framed & Insulated / Standard Wall:	*5.5(%)*	Wall Value	*R19(R)*
Area of Vision Window:	*53.1%*	Window Glazing Assembly Value:	*0.247(U)*
		Window Glazing SHGC:	*Tower/Pod: 0.283 Ground Fl: 0.417*
Area of Doors:	*0.59%*	Door Assembly Value:	*0.24(U)*

Energy Loads and Performance

For this filing – describe how energy loads & performance were determined	*Energy use was calculated with DesignBuilder (EnergyPlus) energy models for Design and ASHRAE 90.1-2013. Peak loads were calculated using Trane Trace 700.*		
Annual Electric:	*3,867,366 (kWh)*	Peak Electric:	*TBD (kW)*
Annual Heating:	*183,756 kWh*	Peak Heating:	*10,000 MBH*
Annual Cooling:	*447,813 kWh*	Peak Cooling:	*900 (Tons)*
Energy Use - Below ASHRAE 90.1 - 2013:	*41 %*	Have the local utilities reviewed the building energy performance?	***Yes*** */ No*
Energy Use - Below Mass. Code:	*38 %*	Energy Use Intensity:	*41.5 (kBtu/SF)*

Back-up / Emergency Power System

Electrical Generation Output:	*2000(kW)*	Number of Power Units:	1
System Type:	*Electric Generator*	Fuel Source:	Diesel

Emergency and Critical System Loads (in the event of a service interruption)

Electric:	*1,745 (kW)*	Heating:	*2,000 (MMbtu/hr)*
		Cooling:	*0 (Tons/hr)*

B – Greenhouse Gas Reduction and Net Zero / Net Positive Carbon Building Performance

Reducing GHG emissions is critical to avoiding more extreme climate change conditions. To achieve the City's goal of carbon neutrality by 2050 new buildings performance will need to progressively improve to net carbon zero and positive.

B.1 – GHG Emissions - Design Conditions

For this Filing - Annual Building GHG Emissions: *1,338 (Tons)*

For this filing - describe how building energy performance has been integrated into project planning, design, and engineering and any supporting analysis or modeling:

Building energy performance is a primary focus of the Project's design team and Proponent. A target EUI has been established and a goal for GHG emissions has been set early in design.

Describe building specific passive energy efficiency measures including orientation, massing, envelop, and systems:

The Project will incorporate: triple glazing curtainwalls with high-performing building envelope; a sawtooth envelope paneling strategy will be utilized on East, South, and West-facing facades.

Describe building specific active energy efficiency measures including equipment, controls, fixtures, and systems:

The Project will utilize daylight and occupancy controls for interior lighting, high-efficiency lighting (LEDs), dual-wheel energy recovery, chilled beams, hybrid geothermal system with water-cooled chillers and electric boilers for peak loads.

Describe building specific load reduction strategies including on-site renewable, clean, and energy storage systems:

The Project is evaluating the feasibility of a geothermal system for load reductions. The Project is evaluating options to incorporate an on-site solar photovoltaic system.

Describe any area or district scale emission reduction strategies including renewable energy, central energy plants, distributed energy systems, and smart grid infrastructure:

N/A

Describe any energy efficiency assistance or support provided or to be provided to the project:

MOU with Eversource and National Grid.

B.2 - GHG Reduction - Adaptation Strategies

Describe how the building and its systems will evolve to further reduce GHG emissions and achieve annual carbon net zero and net positive performance (e.g. added efficiency measures, renewable energy, energy storage, etc.) and the timeline for meeting that goal (by 2050):

In addition to designing an energy efficient building with a proposed Site EUI of 41.5 to reduce the buildings overall energy load, the Project's building systems have been selected to significantly reduce reliance on fossil fuels and to promote the ongoing use of clean energy production for the 100% electrical based building.

C - Extreme Heat Events

Annual average temperature in Boston increased by about 2˚F in the past hundred years and will continue to rise due to climate change. By the end of the century, the average annual temperature could be 56° (compared to 46° now) and the number of days above 90° (currently about 10 a year) could rise to 90.

C.1 – Extreme Heat - Design Conditions

Temperature Range - Low:	*0 Deg.*	Temperature Range - High:	*91 Deg.*
Annual Heating Degree Days:	5,641	Annual Cooling Degree Days	2,897

What Extreme Heat Event characteristics will be / have been used for project planning

Days - Above 90°:	*10-15*	Days – Above 100°:	*1*
Number of Heatwaves / Year:	*3-5*	Average Duration of Heatwave (Days):	*3-5*

Describe all building and site measures to reduce heat-island effect at the site and in the surrounding area:

The Project is studying the feasibility of installing roof gardens on low roofs and terraces. High SRI roof and hardscape areas on-site will reduce heat absorption, and ground level trees and vegetation will reduce direct sunlight exposure on hardscape areas.

C.2 - Extreme Heat – Adaptation Strategies

Describe how the building and its systems will be adapted to efficiently manage future higher average temperatures, higher extreme temperatures, additional annual heatwaves, and longer heatwaves:

The design will consider expanded setpoints during extreme weather events to mitigate load increases over longer heatwave periods. The HVAC design will evaluate the potential for additional space to allow end-of-life equipment replacement to include considerations for re-sizing to accommodate extreme heat event increases throughout the life of the building.

Describe all mechanical and non-mechanical strategies that will support building functionality and use during extended interruptions of utility services and infrastructure including proposed and future adaptations:

Emergency generator for life-safety and heating systems.

D - Extreme Precipitation Events

From 1958 to 2010, there was a 70 percent increase in the amount of precipitation that fell on the days with the heaviest precipitation. Currently, the 10-Year, 24-Hour Design Storm precipitation level is 5.25”. There is a significant probability that this will increase to at least 6” by the end of the century. Additionally, fewer, larger storms are likely to be accompanied by more frequent droughts.

D.1 – Extreme Precipitation - Design Conditions

10 Year, 24 Hour Design Storm:	*5.5 In.*

Describe all building and site measures for reducing storm water run-off:

Stormwater conveyance pipes within the building are being designed per the plumbing code. Stormwater from the building is collected through roof drains and directed into a stormwater retention tank. The tank has been sized to accommodate a volume equal to 1.25 inches over the building roof area. Water from the stormwater retention tank is directed into stormwater injection wells around the building perimeter. Stormwater from site runoff is collected by closed drainage systems and directed into subsurface retention systems.

D.2 - Extreme Precipitation - Adaptation Strategies

Describe how site and building systems will be adapted to efficiently accommodate future more significant rain events (e.g. rainwater harvesting, on-site storm water retention, bio swales, green roofs):

Retention system designed to hold a volume equal to 1.25 inches over the impervious area of the building and the site.

E – Sea Level Rise and Storms

Under any plausible greenhouse gas emissions scenario, sea levels in Boston will continue to rise throughout the century. This will increase the number of buildings in Boston susceptible to coastal flooding and the likely frequency of flooding for those already in the floodplain.

Is any portion of the site in a FEMA SFHA?	*Yes* / ***No***	What Zone:	A, AE, AH, AO, AR, A99, V, VE
		Current FEMA SFHA Zone Base Flood Elevation:	10.46 *Ft BCB* (Charles River)
Is any portion of the site in a BPDA Sea Level Rise - Flood Hazard Area? Use the online BPDA SLR-FHA Mapping Tool to assess the susceptibility of the project site.	*Yes* / ***No***		

If you answered YES to either of the above questions, please complete the following questions.
Otherwise you have completed the questionnaire; thank you!

E.1 – Sea Level Rise and Storms – Design Conditions

Proposed projects should identify immediate and future adaptation strategies for managing the flooding scenario represented on the BPDA Sea Level Rise - Flood Hazard Area (SLR-FHA) map, which depicts a modeled 1% annual chance coastal flood event with 40 inches of sea level rise (SLR). Use the online BPDA SLR-FHA Mapping Tool to identify the highest Sea Level Rise - Base Flood Elevation for the site. The Sea Level Rise - Design Flood Elevation is determined by adding either 24" of freeboard for critical facilities and infrastructure and any ground floor residential units OR 12" of freeboard for other buildings and uses.

Sea Level Rise - Base Flood Elevation:	*Ft BCB*		
Sea Level Rise - Design Flood Elevation:	*Ft BCB*	First Floor Elevation:	*Ft BCB*
Site Elevations at Building:	*Ft BCB*	Accessible Route Elevation:	*Ft BCB*

Describe site design strategies for adapting to sea level rise including building access during flood events, elevated site areas, hard and soft barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe how the proposed Building Design Flood Elevation will be achieved including dry / wet flood proofing, critical systems protection, utility service protection, temporary flood barriers, waste and drain water back flow prevention, etc.:

Describe how occupants might shelter in place during a flooding event including any emergency power, water, and waste water provisions and the expected availability of any such measures:

Describe any strategies that would support rapid recovery after a weather event:

E.2 – Sea Level Rise and Storms – Adaptation Strategies

Describe future site design and or infrastructure adaptation strategies for responding to sea level rise including future elevating of site areas and access routes, barriers, wave / velocity breaks, storm water systems, utility services, etc.:

Describe future building adaptation strategies for raising the Sea Level Rise Design Flood Elevation and further protecting critical systems, including permanent and temporary measures:

A pdf and word version of the Climate Resiliency Checklist is provided for informational use and off-line preparation of a project submission. NOTE: Project filings should be prepared and submitted using the online Climate Resiliency Checklist.

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

Attachment D

ACCESSIBILITY CHECKLIST

Article 80 – Accessibility Checklist

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

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

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

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

Accessibility Analysis Information Sources:

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

Glossary of Terms:

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

1. Project Information:

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

Project Name:	**Boston University Data Sciences Center**
Primary Project Address:	**665 Commonwealth Avenue, Boston MA 02215**
Total Number of Phases/Buildings:	**1**
Primary Contact (Name / Title / Company / Email / Phone):	**Judith Kohn / Vice President / Fort Point Associates, Inc. / jkohn@fpa-inc.com / 617-357-7044 x211**
Owner / Developer:	**Trustees of Boston University**
Architect:	**KPMB Architects**
Civil Engineer:	**Nitsch Engineering, Inc.**
Landscape Architect:	**Richard Burck Associates, Inc.**
Permitting:	**Fort Point Associates, Inc.**
Construction Management:	**Suffolk Construction Company, Inc.**

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

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

Do you anticipate filing for any variances with the Massachusetts Architectural Access Board (MAAB)? ***If yes,*** identify and explain.	Yes - The Project features an assembly area inside the building where study and social gathering will be located. The stair serving this assembly area will be provided with a handrail along one side only, consistent with Americans with Disabilities Act (ADA) requirements. A variance will be sought from MAAB to omit a handrail from the other side of the stair, to allow access in and out of the assembly seating on the ground floor.

2. Building Classification and Description:

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

What are the dimensions of the project? The podium floor plate is approximately 20,500 sf for five stories. The upper floor plates are approximately 14,000 sf for 14 stories.				
Site Area:	47,700 *SF*	Building Area:		305,000 *GSF*
Building Height:	305 *FT.*	Number of Stories:		19 *Flrs* *Incl. 2 story penthouse.*
First Floor Elevation:	21.25' BCB	Is there below grade space:		***Yes*** */ No*
What is the Construction Type? (Select most appropriate type)				
	Wood Frame	Masonry	**Steel Frame**	Concrete
What are the principal building uses? (IBC definitions are below – select all appropriate that apply)				
	Residential – One - Three Unit	Residential - Multi-unit, Four +	**Institutional**	Educational
	Business	Mercantile	Factory	Hospitality
	Laboratory / Medical	Storage, Utility and Other		
List street-level uses of the building:	Institutional classroom and teaching spaces, food services, meeting and gathering spaces			

3. Assessment of Existing Infrastructure for Accessibility:

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

Provide a description of the neighborhood where this development is located and its identifying topographical characteristics:	The Site, located approximately 0.3 miles from Kenmore Square, is in the geographic core of the Charles River Campus. Within two blocks is a wide range of the University's programs in allied health, management, earth sciences, humanities, engineering, and communications. To the east and the west, the Site is flanked by academic and research buildings. To the north, a block of multistory brick townhouses serves as residences for students of the University. Across Commonwealth Avenue to the south is a major complex of buildings that supports instruction and research. These buildings include the recently constructed Rajen Kilachand Center for Life Sciences and Engineering. Boston University Grounds South and Warren Towers, an 18-story undergraduate residence hall, complete the block. Two public open space areas and University-owned parking garages and lots are located within the immediate vicinity of the Site. A variety of shops and restaurants are located in the neighborhood and are accessible by foot, bicycle, and public transportation. The Project ground floor and access points are located on flat terrain.
List the surrounding accessible MBTA transit lines and	The Project is served by four accessible MBTA transit lines located within a quarter-mile distance of the Site. The accessible MBTA transit lines and the proximity of the accessible stops/stations to the Project Site are listed below**:**

their proximity to development site: commuter rail / subway stations, bus stops:	*MBTA Green Line B Branch (Boston College to Park Street Station)*: Boston University East Station (accessible station) is located approximately within 300 feet of walking distance from the accessible entrance on the western side of the Data Sciences Center. *MBTA bus Routes 57 and 57A (run along the Commonwealth Avenue from Watertown Yard to Kenmore Station and from Oak Square to Kenmore Station, respectively)*: The closest outbound accessible stop (to Watertown Yard) is located at Commonwealth Avenue at Granby Street, and is within approximately 200 feet of walking distance from the accessible entrance on the western side of the Site. The closest inbound accessible stop (to Kenmore Square) is located at Commonwealth Avenue at Blandford Street and is approximately within 0.2 miles of walking distance from the accessible entrance on the eastern side of the Site. *MBTA Framingham/Worcester Commuter Rail Line*: Lansdowne Station is the nearest accessible station from the Site, and it is within 0.6 miles walking distance from the accessible entrance on the eastern side of the Site.
List the surrounding institutions: hospitals, public housing, elderly and disabled housing developments, educational facilities, others:	The Site is located within the Boston University Charles River Campus and is surrounded by several Boston University academic buildings located along Commonwealth Avenue as described above. Other institutions are located within 1 mile of driving distance and are listed below: *Public housing*: BHA Trustman Apartments (150 Amory Street, Brookline), *Elderly and disabled housing*: West Fenway Elderly Housing (110 Peterborough Street, Boston) *Hospitals*: Beth Israel Deaconess Medical Center and HRI Hospital.
List the surrounding government buildings: libraries, community centers, recreational facilities, and other related facilities:	There are no surrounding government buildings other than a limited number of non-profit Community Centers within approximately one mile of the Site. These include the Fenway Community Center and the Brookline Community Center for the Arts.
4. Surrounding Site Conditions – Existing: *This section identifies current condition of the sidewalks and pedestrian ramps at the development site.*	
Is the development site within a historic district? *If yes,* identify which district:	Yes – Local district: Bay State Road Back Bay West Architectural Conservation District.
Are there sidewalks and pedestrian ramps existing at the development	Yes -There are existing concrete sidewalks and pedestrian ramps along Granby Street and Commonwealth Avenue. The sidewalks and ramps are all in good condition. Pedestrian Ramp 1 is used to cross Commonwealth Avenue. It has a detectable warning strip, is approximately 6’ wide and 3’ long, and has a longitudinal slope of 5.5% and cross

site? *If yes*, list the existing sidewalk and pedestrian ramp dimensions, slopes, materials, and physical condition at the development site:	slope of 1.1%. Pedestrian Ramp 2 is used to Cross Granby Street. It has a detectable warning strip, is approximately 5' wide and 10' long, and has a longitudinal slope of 4.7% and cross slope of 1.9%.
Are the sidewalks and pedestrian ramps existing-to-remain? ***If yes,*** have they been verified as ADA / MAAB compliant (with yellow composite detectable warning surfaces, cast in concrete)? ***If yes,*** provide description and photos:	No - Sidewalks and pedestrian ramps will be removed and reconstructed to meet ADA/MAAB requirements if they are not compliant.

5. Surrounding Site Conditions – Proposed

This section identifies the proposed condition of the walkways and pedestrian ramps around the development site. Sidewalk width contributes to the degree of comfort walking along a street. Narrow sidewalks do not support lively pedestrian activity, and may create dangerous conditions that force people to walk in the street. Wider sidewalks allow people to walk side by side and pass each other comfortably walking alone, walking in pairs, or using a wheelchair.

Are the proposed sidewalks consistent with the Boston Complete Street Guidelines? ***If yes***, choose which Street Type was applied: Downtown Commercial, Downtown Mixed-use, Neighborhood Main, Connector, Residential, Industrial, Shared Street, Parkway, or Boulevard.	Yes - Commonwealth Avenue is classified as a Boulevard and Granby Street is classified as a Neighborhood Connector. The portion of Commonwealth Avenue adjacent to the site has existing trees that will be replaced, and the existing granite curb and brick pavers will be replaced to match existing. The sidewalk underwent significant alteration and improvement during Phase I of the Commonwealth Avenue Improvement Project, completed in 2010. This sidewalk presently meets Complete Streets Guidelines and is consistent with the Downtown Commercial street type. The Project will preserve the sidewalk where possible and reconstruct it to meet ADA/MAAB requirements where necessary. The portion of Granby Street adjacent to the Site does not currently have trees and consists of concrete sidewalks and brick pavers. The Project proposes for the existing concrete sidewalks and brick pavers to be replaced in kind. Along the east side of Granby Street, the Project includes 9 new trees in raised granite planters with ground cover, and two 6' bike lanes on each side of the street. Approximately 15 new trees will also be added to the back of the sidewalk within the private site on the north side of the private passageway near the intersection of Bay State Road.

What are the total dimensions and slopes of the proposed sidewalks? List the widths of the proposed zones: Frontage, Pedestrian and Furnishing Zone:	Along Commonwealth Avenue, the dimensions of the sidewalk will match existing. From the curb, there is a 10' wide Furnishing Zone and a 11' – 26' wide Pedestrian Zone. The cross slopes will be less than 2.0% and the longitudinal slopes will be less than 5.0%. Along Granby Street, there will be a 10'-6" wide Furnishing Zone on the east side of the street, and a 7'-6" wide Pedestrian Zone. The cross slopes will be less than 2.0% and the longitudinal slopes will be less than five percent.
List the proposed materials for each Zone. Will the proposed materials be on private property or will the proposed materials be on the City of Boston pedestrian right-of-way?	Along Commonwealth Avenue, the Furnishing Zone is comprised raised planters, pervious brick pavers, flush granite bands, bike racks, and benches and other pedestrian amenities. Reconstruction will strive to match existing conditions with the following exceptions. In order to intercept and infiltrate stormwater from the pedestrian zone the raised planters will have openings that allow stormwater to enter the planter and infiltrate. Similarly, the brick pavers will be pervious to allow any remaining runoff to infiltrate. The Pedestrian Zone includes a 15'-0" concrete sidewalk with tooled control joints and broom finish. Along Granby Street, the Furnishing Zone will include similar raised planters that infiltrate, permeable pavers, proposed street lights and street trees. The Pedestrian Zone includes 7'-6" of concrete sidewalk with tooled control joints and broom finish from the curb, with 24'-2" of pavers within the private property. Proposed Furnishing and Pedestrian zones will be located within the City right-of-way.
Will sidewalk cafes or other furnishings be programmed for the pedestrian right-of-way? ***If yes,*** what are the proposed dimensions of the sidewalk café or furnishings and what will the remaining right-of-way clearance be?	No - An indoor café will serve outdoor seating located under the building soffit on the ground floor along Granby Street.
If the pedestrian right-of-way is on private property, will the proponent seek a pedestrian easement with the Public Improvement Commission (PIC)?	Not applicable.

Will any portion of the Project be going through the PIC? ***If yes,*** identify PIC actions and provide details.	Yes - The PIC actions will include specific repairs along Commonwealth Avenue and Granby Street. And a License Maintenance Agreement for stormwater recharge structures.
6. Accessible Parking: *See Massachusetts Architectural Access Board Rules and Regulations 521 CMR Section 23.00 regarding accessible parking requirement counts and the Massachusetts Office of Disability – Disabled Parking Regulations*.	
What is the total number of parking spaces provided at the development site? Will these be in a parking lot or garage?	The Project does not provide parking spaces at the Site.
What is the total number of accessible spaces provided at the development site? How many of these are "Van Accessible" spaces with an 8 foot access aisle?	The Project does not provide parking spaces at the Site. There will be no accessible spaces provided at the Site.
Will any on-street accessible parking spaces be required? ***If yes,*** has the proponent contacted the Commission for Persons with Disabilities regarding this need?	No - The Project does not require on-street accessible parking spaces.
Where is the accessible visitor parking located?	Boston University operates the parking and transportation system on the campus and accessible visitor parking is available at nearby lots across Comm Ave and across Granby street. Accessible parking is also available in nearby lots owned by the Proponent. See Figure B-1.

Has a drop-off area been identified? *If yes,* will it be accessible?	One accessible drop-off area is proposed on the Commonwealth Avenue sidewalk in front of the building at the curb.
7. Circulation and Accessible Routes: *The primary objective in designing smooth and continuous paths of travel is to create universal access to entryways and common spaces, which accommodates persons of all abilities and allows for visitability with neighbors.*	
Describe accessibility at each entryway: Example: Flush Condition, Stairs, Ramp, Lift or Elevator:	The two main building entrances on the east and west sides will be flush. Secondary entrances on the north (west corner) side of the building will also be flush. There is another entryway that leads to the loading dock entrance. which leads to stairs and an elevated loading dock. Emergency egress doors will be flush even though these entrances lead to stairs.
Are the accessible entrances and standard entrance integrated? ***If yes,*** *describe.* ***If no,*** what is the reason?	Yes - The main entrances are flush conditions and are fully accessible.
If project is subject to Large Project Review/Institutional Master Plan, describe the accessible routes way-finding / signage package.	Accessible routes wayfinding signage packages will be developed during the Article 80 review process.
8. Accessible Units (Group 2) and Guestrooms: (If applicable) *In order to facilitate access to housing and hospitality, this section addresses the number of accessible units that are proposed for the development site that remove barriers to housing and hotel rooms.*	
What is the total number of proposed housing units or hotel rooms for the development?	
If a residential development, how many units are for sale? How many are	

for rent? What is the breakdown of market value units vs. IDP (Inclusionary Development Policy) units?	
If a residential development, how many accessible Group 2 units are being proposed?	
If a residential development, how many accessible Group 2 units will also be IDP units? ***If none***, describe reason.	
If a hospitality development, how many accessible units will feature a wheel-in shower? Will accessible equipment be provided as well? ***If yes,*** provide amount and location of equipment.	
Do standard units have architectural barriers that would prevent entry or use of common space for persons with mobility impairments? Example: stairs / thresholds at entry, step to balcony, others. ***If yes,*** provide reason.	
Are there interior elevators, ramps or lifts located in the development for	

access around architectural barriers and/or to separate floors? ***If yes,*** describe:	
9. Community Impact: *Accessibility and inclusion extend past required compliance with building codes. Providing an overall scheme that allows full and equal participation of persons with disabilities makes the development an asset to the surrounding community*.	
Is this project providing any funding or improvements to the surrounding neighborhood? Examples: adding extra street trees, building or refurbishing a local park, or supporting other community-based initiatives?	The Project improves the surrounding neighborhood by incorporating new landscape features on Granby Street, and behind the building in the laneway, and by adding accessible paths to the rear entrances to the University- owned townhouses which front on Bay state Road. The Project will also provide reconstruction and improvements to a 3,600-sf University-owned open space located at the intersection of Granby Street and Bay State Road. Bicycle parking spaces will be located on Granby Street and Commonwealth Avenue along with street trees, granite curbing, and permeable pavers. The building will be set back at Granby Street and along Commonwealth Avenue to add gathering spaces in the public realm.
What inclusion elements does this development provide for persons with disabilities in common social and open spaces? Example: Indoor seating and TVs in common rooms; outdoor seating and barbeque grills in yard. Will all of these spaces and features provide accessibility?	Outdoor seating and gathering areas will be provided in areas surrounding the building on all sides. A ground floor café will be accessible and open to the public.
Are any restrooms planned in common public spaces? ***If yes,*** will any be single-stall, ADA compliant and	Yes. Accessible toilet rooms are planned in common public spaces. At least one gender neutral accessible toilet room will be serving the common public areas.

designated as "Family"/ "Companion" restrooms? ***If no***, explain why not.	
Has the proponent reviewed the proposed plan with the City of Boston Disability Commissioner or with their Architectural Access staff? ***If yes,*** did they approve? ***If no,*** what were their comments?	The Project has been reviewed by a staff member at a meeting with the BPDA, but not yet reviewed by the Disability Commissioner or Advisory Board. Meetings are planned to follow the submittal of the DPIR. The Project will likely require a variance due to the lack of a handrail at one location, which will necessitate a review and approval by the Massachusetts Architectural Access Board.
Has the proponent presented the proposed plan to the Disability Advisory Board at one of their monthly meetings? Did the Advisory Board vote to support this project? ***If no,*** what recommendations did the Advisory Board give to make this project more accessible?	No - The Proponent plans to meet with the Advisory board during the Article 80 review process.

10. Attachments

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

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

See attached Parking Accessibility Diagram.

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

See attached Site Accessibility Diagram.

Provide a diagram the accessible route to any roof decks or outdoor courtyard space? (if applicable) Roof decks on the tower floors will be accessible to users of the building.
Provide a plan and diagram of the accessible Group 2 units, including locations and route from accessible entry.
Provide any additional drawings, diagrams, photos, or any other material that describes the inclusive and accessible elements of this project. See DPIR Chapters 2:0 Project Description and 3:0 Urban Design.

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

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

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

Architectural Access staff can be reached at:

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

Attachment E

TRANSPORTATION DATA

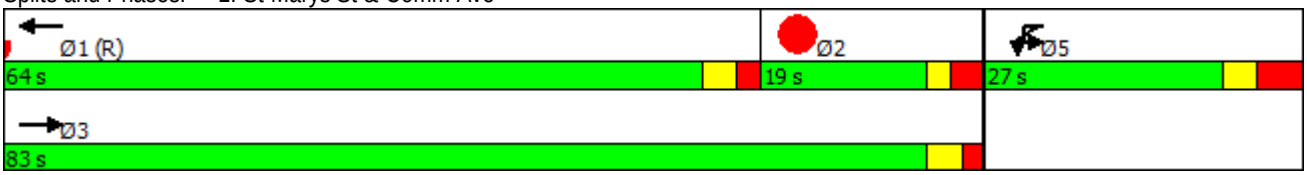
SYNCHRO ANALYSIS OUTPUT

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	616	38	29	35	517	0	0	
Future Volume (vph)	616	38	29	35	517	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.96			0.76				
Frt	0.989							
Flt Protected				0.950				
Satd. Flow (prot)	3007	0	0	1692	2980	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3007	0	0	1293	2980	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	18							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		210	171	210				
Confl. Bikes (#/hr)		85						
Peak Hour Factor	0.87	0.70	0.73	0.70	0.87	0.92	0.92	
Heavy Vehicles (%)	7%	3%	7%	0%	6%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	708	54	40	50	594	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	762	0	0	90	594	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	83.0		27.0	27.0	64.0			19.0
Total Split (%)	75.5%		24.5%	24.5%	58.2%			17%
Maximum Green (s)	78.0		20.0	20.0	59.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	90.6			11.4	70.6			
Actuated g/C Ratio	0.82			0.10	0.64			
v/c Ratio	0.31			0.51	0.31			
Control Delay	3.5			50.0	16.5			
Queue Delay	0.0			0.0	0.4			
Total Delay	3.5			50.0	16.9			
LOS	A			D	B			
Approach Delay	3.5				21.2			
Approach LOS	A				C			
Queue Length 50th (ft)	62			64	115			
Queue Length 95th (ft)	97			86	202			
Internal Link Dist (ft)	492				324	368		
Turn Bay Length (ft)				250				
Base Capacity (vph)	2478			307	1911			
Starvation Cap Reductn	0			0	751			
Spillback Cap Reductn	0			0	0			
Storage Cap Reductn	0			0	0			
Reduced v/c Ratio	0.31			0.29	0.51			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 57 (52%), Referenced to phase 1:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.51			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 39.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: St Marys St & Comm Ave



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	127	0	519	0	0	435	0	17	0	5	0	0
Future Volume (vph)	127	0	519	0	0	435	0	17	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3058	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1615	2952	0	0	3058	0	1602	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	3			235				3		147		
Peak Hour Factor	0.88	0.92	0.98	0.92	0.92	0.85	0.92	0.70	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	7%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	144	0	530	0	0	512	0	24	0	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	144	530	0	0	512	0	24	0	7	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	69.0			69.0		23.0		23.0		
Total Split (%)	16.4%	16.4%	62.7%			62.7%		20.9%		20.9%		
Maximum Green (s)	12.0	12.0	63.0			63.0		16.0		16.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		14.9	74.5			74.5		6.4		6.4		
Actuated g/C Ratio		0.14	0.68			0.68		0.06		0.06		
v/c Ratio		0.66	0.27			0.25		0.26		0.05		
Control Delay		55.0	13.6			8.8		55.8		0.6		
Queue Delay		0.0	0.0			0.3		0.0		0.0		
Total Delay		55.0	13.6			9.1		55.8		0.6		
LOS		E	B			A		E		A		
Approach Delay			22.5			9.1			43.3			
Approach LOS			C			A			D			
Queue Length 50th (ft)		98	89			77		17		0		
Queue Length 95th (ft)		159	194			115		34		0		
Internal Link Dist (ft)			324			298			219			19
Turn Bay Length (ft)		120										
Base Capacity (vph)		227	2000			2071		234		243		
Starvation Cap Reductn		0	0			941		0		0		
Spillback Cap Reductn		0	0			0		0		0		
Storage Cap Reductn		0	0			0		0		0		
Reduced v/c Ratio		0.63	0.27			0.45		0.10		0.03		

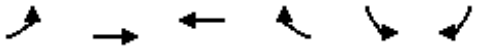
Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 17.4 Intersection LOS: B
Intersection Capacity Utilization 39.1% ICU Level of Service A
Analysis Period (min) 15

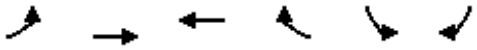
Splits and Phases: 2: Cummington Mall & Comm Ave

Lane Group	SBR
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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



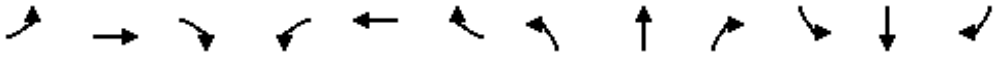
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	520	381	0	36	49
Future Volume (vph)	0	520	381	0	36	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.82	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3261	3001	0	1527	1366
Flt Permitted					0.950	
Satd. Flow (perm)	0	3261	3001	0	1249	1366
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						68
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)					109	112
Peak Hour Factor	0.92	0.94	0.88	0.92	0.69	0.72
Heavy Vehicles (%)	2%	7%	9%	2%	0%	0%
Parking (#/hr)			5		5	5
Adj. Flow (vph)	0	553	433	0	52	68
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	553	433	0	52	68
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.24	1.24
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		1	1		5	5
Permitted Phases						
Detector Phase		1	1		5	5
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)		10.0	10.0		8.0	8.0
Minimum Split (s)		24.0	24.0		24.0	24.0
Total Split (s)		71.0	71.0		29.0	29.0
Total Split (%)		71.0%	71.0%		29.0%	29.0%
Maximum Green (s)		65.0	65.0		23.0	23.0
Yellow Time (s)		4.0	4.0		3.0	3.0
All-Red Time (s)		2.0	2.0		3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		82.5	82.5		9.5	9.5
Actuated g/C Ratio		0.82	0.82		0.10	0.10
v/c Ratio		0.21	0.17		0.36	0.36
Control Delay		2.8	2.7		49.1	15.8
Queue Delay		0.3	0.0		0.0	0.0
Total Delay		3.1	2.7		49.1	15.8
LOS		A	A		D	B
Approach Delay		3.1	2.7		30.2	
Approach LOS		A	A		C	
Queue Length 50th (ft)		36	27		32	0
Queue Length 95th (ft)		60	46		51	23
Internal Link Dist (ft)		298	122		265	
Turn Bay Length (ft)						
Base Capacity (vph)		2691	2476		351	366
Starvation Cap Reductn		1424	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.44	0.17		0.15	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.36			
Intersection Signal Delay: 5.9		Intersection LOS: A	
Intersection Capacity Utilization 39.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Comm Ave & Granby St

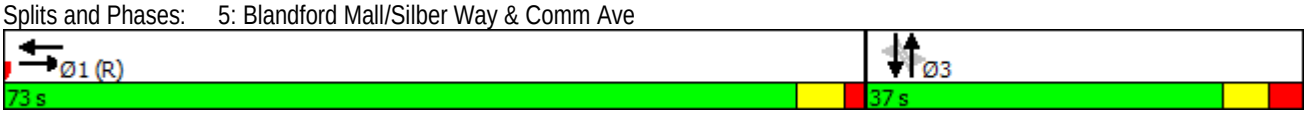


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	481	15	0	385	92	0	0	0	0	0	22
Future Volume (vph)	0	481	15	0	385	92	0	0	0	0	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.88						0.79	
Frt		0.994			0.967						0.865	
Flt Protected												
Satd. Flow (prot)	0	3194	0	0	2591	0	0	1863	0	0	1076	0
Flt Permitted												
Satd. Flow (perm)	0	3194	0	0	2591	0	0	1863	0	0	1076	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			61						163	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			108			212	394		232	232		111
Confl. Bikes (#/hr)			65			5			13			5
Peak Hour Factor	0.92	0.95	0.70	0.92	0.84	0.70	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	7%	7%	2%	9%	2%	2%	2%	2%	2%	2%	5%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	506	21	0	458	131	0	0	0	0	0	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	527	0	0	589	0	0	0	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA						NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		73.0			73.0		37.0	37.0		37.0	37.0	
Total Split (%)		66.4%			66.4%		33.6%	33.6%		33.6%	33.6%	
Maximum Green (s)		67.0			67.0		30.0	30.0		30.0	30.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		97.4			97.4						8.0	
Actuated g/C Ratio		0.89			0.89						0.07	
v/c Ratio		0.19			0.26						0.14	
Control Delay		1.8			1.9						1.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		1.8			1.9						1.2	
LOS		A			A						A	
Approach Delay		1.8			1.9						1.2	
Approach LOS		A			A						A	
Queue Length 50th (ft)		34			36						0	
Queue Length 95th (ft)		45			45						0	
Internal Link Dist (ft)		520			878			243			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2829			2301						412	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.19			0.26						0.08	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 99 (90%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 1.9		Intersection LOS: A	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	479	86	0	381	0	4
Future Vol, veh/h	479	86	0	381	0	4
Conflicting Peds, #/hr	0	257	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	80	92	88	92	70
Heavy Vehicles, %	7	3	2	9	2	0
Mvmt Flow	510	108	0	433	0	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	566
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	473
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	377
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	377	-	-	-
HCM Lane V/C Ratio	0.015	-	-	-
HCM Control Delay (s)	14.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	10.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	11	85	70	2	0	0	0	0	3	1
Future Vol, veh/h	0	0	11	85	70	2	0	0	0	0	3	1
Conflicting Peds, #/hr	68	0	103	103	0	68	0	0	0	59	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	70	73	70	70	92	92	92	92	75	70
Heavy Vehicles, %	2	2	18	0	3	0	2	2	2	2	0	0
Mvmt Flow	0	0	16	116	100	3	0	0	0	0	4	1

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	136	17	120	116	17	68			-	-	0
Stage 1	17	17	-	0	0	-			-	-	-
Stage 2	119	0	-	116	17	-			-	-	-
Critical Hdwy	7.12	6.52	6.38	7.1	6.53	6.2			-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.53	-			-	-	-
Follow-up Hdwy	3.518	4.018	3.462	3.5	4.027	3.3			-	-	-
Pot Cap-1 Maneuver	835	877	890	865	875	1001			0	-	-
Stage 1	1002	881	-	-	-	-			0	-	-
Stage 2	-	-	-	894	879	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	685	867	880	850	865	915			-	-	-
Mov Cap-2 Maneuver	685	867	-	850	865	-			-	-	-
Stage 1	1002	871	-	-	-	-			-	-	-
Stage 2	-	-	-	878	869	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	9.2	10.6	0
HCM LOS	A	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	880	858	-	-
HCM Lane V/C Ratio	0.018	0.256	-	-
HCM Control Delay (s)	9.2	10.6	-	-
HCM Lane LOS	A	B	-	-
HCM 95th %tile Q(veh)	0.1	1	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	44	131	6	46	26	0	0	10	1
Future Vol, veh/h	0	0	0	44	131	6	46	26	0	0	10	1
Peak Hour Factor	0.92	0.92	0.92	0.79	0.89	0.70	0.82	0.70	0.25	0.92	0.83	0.70
Heavy Vehicles, %	2	2	2	2	3	0	4	8	2	0	0	0
Mvmt Flow	0	0	0	56	147	9	56	37	0	0	12	1
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.6	8.2	7.5
HCM LOS	A	A	A

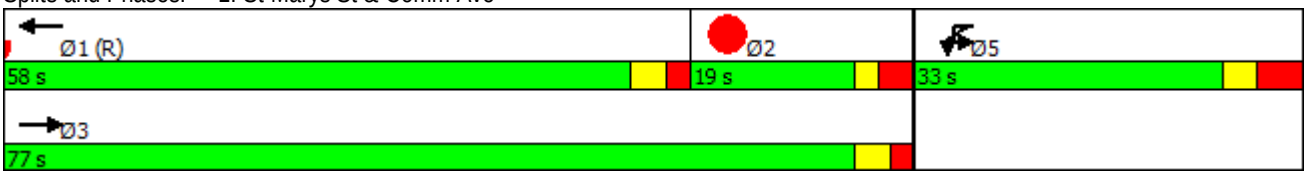
Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	64%	24%	0%
Vol Thru, %	36%	72%	91%
Vol Right, %	0%	3%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	72	181	11
LT Vol	46	44	0
Through Vol	26	131	10
RT Vol	0	6	1
Lane Flow Rate	93	211	13
Geometry Grp	1	1	1
Degree of Util (X)	0.119	0.244	0.017
Departure Headway (Hd)	4.593	4.148	4.435
Convergence, Y/N	Yes	Yes	Yes
Cap	785	854	811
Service Time	2.594	2.227	2.438
HCM Lane V/C Ratio	0.118	0.247	0.016
HCM Control Delay	8.2	8.6	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.4	1	0.1

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	665	93	82	115	755	0	0	
Future Volume (vph)	665	93	82	115	755	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.93			0.77				
Frt	0.983							
Flt Protected				0.950				
Satd. Flow (prot)	3021	0	0	1730	3067	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3021	0	0	1335	3067	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	27							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		242	359	242				
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.80	0.86	0.82	0.87	0.85	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	3%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	831	108	100	132	888	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	939	0	0	232	888	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	77.0		33.0	33.0	58.0			19.0
Total Split (%)	70.0%		30.0%	30.0%	52.7%			17%
Maximum Green (s)	72.0		26.0	26.0	53.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	78.2			19.8	59.2			
Actuated g/C Ratio	0.71			0.18	0.54			
v/c Ratio	0.44			0.75	0.54			
Control Delay	7.7			48.6	20.7			
Queue Delay	0.0			0.0	0.7			
Total Delay	7.7			48.6	21.5			
LOS	A			D	C			
Approach Delay	7.7				27.1			
Approach LOS	A				C			
Queue Length 50th (ft)	125			99	262			
Queue Length 95th (ft)	164			147	335			
Internal Link Dist (ft)	492				324	368		
Turn Bay Length (ft)				250				
Base Capacity (vph)	2156			408	1651			
Starvation Cap Reductn	0			0	416			
Spillback Cap Reductn	0			0	0			
Storage Cap Reductn	0			0	0			
Reduced v/c Ratio	0.44			0.57	0.72			

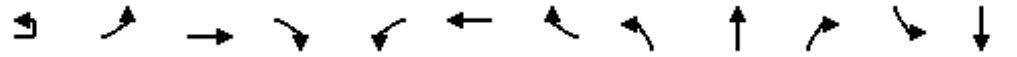
Intersection Summary	
Area Type:	Other
Cycle Length: 110	
Actuated Cycle Length: 110	
Offset: 95 (86%), Referenced to phase 1:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 18.3	Intersection LOS: B
Intersection Capacity Utilization 47.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: St Marys St & Comm Ave



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	91	0	665	0	0	800	0	59	0	11	0	0
Future Volume (vph)	91	0	665	0	0	800	0	59	0	11	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.98				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3176	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1614	2952	0	0	3176	0	1585	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	7			369				7		271		
Peak Hour Factor	0.81	0.92	0.75	0.92	0.92	0.88	0.92	0.78	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	3%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	112	0	887	0	0	909	0	76	0	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	112	887	0	0	909	0	76	0	16	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	



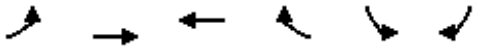
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	71.0			71.0		21.0		21.0		
Total Split (%)	16.4%	16.4%	64.5%			64.5%		19.1%		19.1%		
Maximum Green (s)	12.0	12.0	65.0			65.0		14.0		14.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		11.1	72.8			72.8		9.6		9.6		
Actuated g/C Ratio		0.10	0.66			0.66		0.09		0.09		
v/c Ratio		0.68	0.45			0.43		0.54		0.09		
Control Delay		63.3	10.3			6.9		61.7		1.0		
Queue Delay		0.0	0.4			0.2		0.0		0.0		
Total Delay		63.3	10.6			7.1		61.7		1.0		
LOS		E	B			A		E		A		
Approach Delay			16.6			7.1			51.1			
Approach LOS			B			A			D			
Queue Length 50th (ft)		78	139			67		52		0		
Queue Length 95th (ft)		#150	165			98		83		0		
Internal Link Dist (ft)			324			298			219			19
Turn Bay Length (ft)		120										
Base Capacity (vph)		184	1952			2100		205		224		
Starvation Cap Reductn		0	504			432		0		0		
Spillback Cap Reductn		0	0			231		0		0		
Storage Cap Reductn		0	0			0		0		0		
Reduced v/c Ratio		0.61	0.61			0.54		0.37		0.07		

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 59 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.68			
Intersection Signal Delay: 13.8		Intersection LOS: B	
Intersection Capacity Utilization 47.2%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

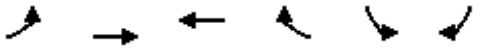
Splits and Phases: 2: Cummington Mall & Comm Ave

Lane Group	SBR
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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



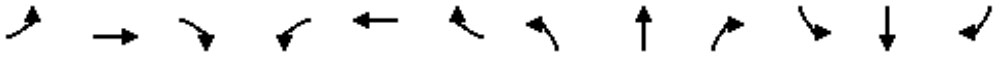
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	680	626	0	104	174
Future Volume (vph)	0	680	626	0	104	174
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.72	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3388	3146	0	1527	1366
Flt Permitted					0.950	
Satd. Flow (perm)	0	3388	3146	0	1093	1366
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						196
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)					155	230
Peak Hour Factor	0.92	0.78	0.88	0.92	0.90	0.89
Heavy Vehicles (%)	2%	3%	4%	2%	0%	0%
Parking (#/hr)			5		5	5
Adj. Flow (vph)	0	872	711	0	116	196
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	872	711	0	116	196
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.24	1.24
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		1	1		5	5
Permitted Phases						
Detector Phase		1	1		5	5
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)		10.0	10.0		8.0	8.0
Minimum Split (s)		24.0	24.0		24.0	24.0
Total Split (s)		74.0	74.0		36.0	36.0
Total Split (%)		67.3%	67.3%		32.7%	32.7%
Maximum Green (s)		68.0	68.0		30.0	30.0
Yellow Time (s)		4.0	4.0		3.0	3.0
All-Red Time (s)		2.0	2.0		3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		84.3	84.3		13.7	13.7
Actuated g/C Ratio		0.77	0.77		0.12	0.12
v/c Ratio		0.34	0.30		0.61	0.57
Control Delay		0.5	4.2		58.5	12.9
Queue Delay		0.1	0.0		0.0	0.0
Total Delay		0.6	4.2		58.5	12.9
LOS		A	A		E	B
Approach Delay		0.6	4.2		29.9	
Approach LOS		A	A		C	
Queue Length 50th (ft)		1	94		79	0
Queue Length 95th (ft)		1	107		131	61
Internal Link Dist (ft)		298	122		265	
Turn Bay Length (ft)						
Base Capacity (vph)		2596	2410		416	515
Starvation Cap Reductn		413	0		0	0
Spillback Cap Reductn		0	24		0	1
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.40	0.30		0.28	0.38

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 68 (62%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 6.8		Intersection LOS: A	
Intersection Capacity Utilization 46.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Comm Ave & Granby St

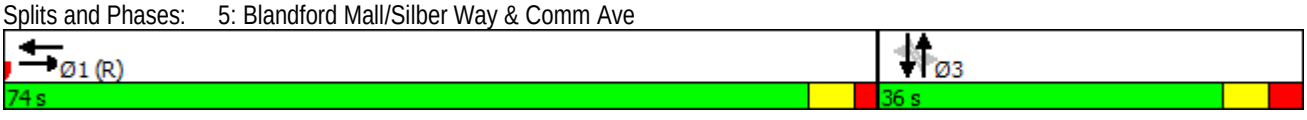


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	750	20	0	572	120	0	0	0	0	0	60
Future Volume (vph)	0	750	20	0	572	120	0	0	0	0	0	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.88						0.64	
Frt		0.996			0.971						0.865	
Flt Protected												
Satd. Flow (prot)	0	3323	0	0	2697	0	0	1863	0	0	897	0
Flt Permitted												
Satd. Flow (perm)	0	3323	0	0	2697	0	0	1863	0	0	897	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14						54	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			255			378	514		421	421		320
Confl. Bikes (#/hr)			16			5			13			5
Peak Hour Factor	0.92	0.91	0.83	0.92	0.91	0.81	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	3%	0%	2%	4%	1%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	824	24	0	629	148	0	0	0	0	0	86
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	848	0	0	777	0	0	0	0	0	86	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA						NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		74.0			74.0		36.0	36.0		36.0	36.0	
Total Split (%)		67.3%			67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)		68.0			68.0		29.0	29.0		29.0	29.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		89.8			89.8						11.4	
Actuated g/C Ratio		0.82			0.82						0.10	
v/c Ratio		0.31			0.35						0.61	
Control Delay		3.2			4.3						38.6	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.2			4.3						38.6	
LOS		A			A						D	
Approach Delay		3.2			4.3						38.6	
Approach LOS		A			A						D	
Queue Length 50th (ft)		69			64						22	
Queue Length 95th (ft)		142			130						71	
Internal Link Dist (ft)		520			878			243			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2713			2204						276	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.31			0.35						0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 43 (39%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 5.5		Intersection LOS: A	
Intersection Capacity Utilization 47.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	735	58	0	626	0	53
Future Vol, veh/h	735	58	0	626	0	53
Conflicting Peds, #/hr	0	538	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	91	92	88	92	70
Heavy Vehicles, %	3	2	2	4	2	0
Mvmt Flow	865	64	0	711	0	76

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1002
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	244
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	140
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	57.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	140	-	-	-
HCM Lane V/C Ratio	0.541	-	-	-
HCM Control Delay (s)	57.5	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	2.7	-	-	-

Intersection	
Int Delay, s/veh	15

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↱	
Traffic Vol, veh/h	5	0	56	219	52	31	0	0	0	0	13	0
Future Vol, veh/h	5	0	56	219	52	31	0	0	0	0	13	0
Conflicting Peds, #/hr	50	0	252	252	0	50	0	0	0	160	0	68
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	92	78	96	81	70	92	92	92	92	70	70
Heavy Vehicles, %	0	2	0	0	0	3	2	2	2	0	0	0
Mvmt Flow	7	0	72	228	64	44	0	0	0	0	19	0

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	191	87	339	306	87	50			-	-	0
Stage 1	87	87	-	0	0	-			-	-	-
Stage 2	104	0	-	306	87	-			-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.5	6.23			-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-			-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4	3.327			-	-	-
Pot Cap-1 Maneuver	773	803	708	650	807	1015			0	-	-
Stage 1	926	823	-	-	-	-			0	-	-
Stage 2	-	-	-	708	827	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	604	751	662	580	755	951			-	-	-
Mov Cap-2 Maneuver	604	751	-	580	755	-			-	-	-
Stage 1	926	770	-	-	-	-			-	-	-
Stage 2	-	-	-	631	773	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	11.2	16.7	0
HCM LOS	B	C	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	656	641	-	-
HCM Lane V/C Ratio	0.12	0.525	-	-
HCM Control Delay (s)	11.2	16.7	-	-
HCM Lane LOS	B	C	-	-
HCM 95th %tile Q(veh)	0.4	3.1	-	-

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	95	185	14	89	33	0	0	15	13
Future Vol, veh/h	0	0	0	95	185	14	89	33	0	0	15	13
Peak Hour Factor	0.92	0.92	0.92	0.77	0.87	0.70	0.93	0.75	0.25	0.92	0.70	0.70
Heavy Vehicles, %	2	2	2	0	0	0	1	0	2	0	0	0
Mvmt Flow	0	0	0	123	213	20	96	44	0	0	21	19
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	10.7	9.1	7.9
HCM LOS	B	A	A

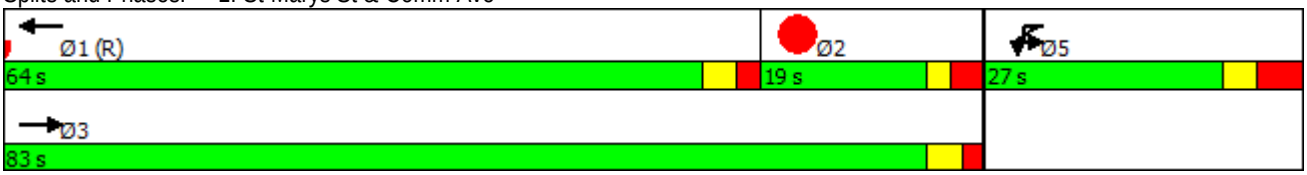
Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	73%	32%	0%
Vol Thru, %	27%	63%	54%
Vol Right, %	0%	5%	46%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	122	294	28
LT Vol	89	95	0
Through Vol	33	185	15
RT Vol	0	14	13
Lane Flow Rate	140	356	40
Geometry Grp	1	1	1
Degree of Util (X)	0.192	0.433	0.051
Departure Headway (Hd)	4.941	4.381	4.632
Convergence, Y/N	Yes	Yes	Yes
Cap	726	822	772
Service Time	2.97	2.404	2.668
HCM Lane V/C Ratio	0.193	0.433	0.052
HCM Control Delay	9.1	10.7	7.9
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.7	2.2	0.2

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	663	39	30	36	527	0	0	
Future Volume (vph)	663	39	30	36	527	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.96			0.78				
Frt	0.990							
Flt Protected				0.950				
Satd. Flow (prot)	3014	0	0	1692	2980	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3014	0	0	1323	2980	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	17							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		210	171	210				
Confl. Bikes (#/hr)		85						
Peak Hour Factor	0.87	0.70	0.73	0.70	0.87	0.92	0.92	
Heavy Vehicles (%)	7%	3%	7%	0%	6%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	762	56	41	51	606	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	818	0	0	92	606	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	83.0		27.0	27.0	64.0			19.0
Total Split (%)	75.5%		24.5%	24.5%	58.2%			17%
Maximum Green (s)	78.0		20.0	20.0	59.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	90.5			11.5	70.5			
Actuated g/C Ratio	0.82			0.10	0.64			
v/c Ratio	0.33			0.52	0.32			
Control Delay	3.7			50.0	17.0			
Queue Delay	0.0			0.0	0.4			
Total Delay	3.7			50.0	17.4			
LOS	A			D	B			
Approach Delay	3.7				21.7			
Approach LOS	A				C			
Queue Length 50th (ft)	68			65	124			
Queue Length 95th (ft)	107			88	207			
Internal Link Dist (ft)	492				324	368		
Turn Bay Length (ft)				250				
Base Capacity (vph)	2481			307	1908			
Starvation Cap Reductn	0			0	747			
Spillback Cap Reductn	0			0	0			
Storage Cap Reductn	0			0	0			
Reduced v/c Ratio	0.33			0.30	0.52			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 57 (52%), Referenced to phase 1:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.52			
Intersection Signal Delay: 12.0		Intersection LOS: B	
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: St Marys St & Comm Ave



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	130	0	564	0	0	444	0	17	0	5	0	0
Future Volume (vph)	130	0	564	0	0	444	0	17	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3058	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1616	2952	0	0	3058	0	1602	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	3			235				3		147		
Peak Hour Factor	0.88	0.92	0.98	0.92	0.92	0.85	0.92	0.70	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	7%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	148	0	576	0	0	522	0	24	0	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	148	576	0	0	522	0	24	0	7	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	

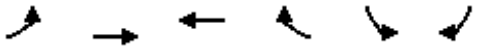
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	69.0			69.0		23.0		23.0		
Total Split (%)	16.4%	16.4%	62.7%			62.7%		20.9%		20.9%		
Maximum Green (s)	12.0	12.0	63.0			63.0		16.0		16.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		15.3	74.2			74.2		6.4		6.4		
Actuated g/C Ratio		0.14	0.67			0.67		0.06		0.06		
v/c Ratio		0.66	0.29			0.25		0.26		0.05		
Control Delay		54.4	14.4			8.9		55.8		0.6		
Queue Delay		0.0	0.3			0.3		0.0		0.0		
Total Delay		54.4	14.7			9.3		55.8		0.6		
LOS		D	B			A		E		A		
Approach Delay			22.8			9.3			43.3			
Approach LOS			C			A			D			
Queue Length 50th (ft)		101	105			80		17		0		
Queue Length 95th (ft)		163	216			117		34		0		
Internal Link Dist (ft)			324			298			219			19
Turn Bay Length (ft)		120										
Base Capacity (vph)		231	1990			2061		234		243		
Starvation Cap Reductn		0	793			929		0		0		
Spillback Cap Reductn		0	0			0		0		0		
Storage Cap Reductn		0	0			0		0		0		
Reduced v/c Ratio		0.64	0.48			0.46		0.10		0.03		

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 17.8		Intersection LOS: B	
Intersection Capacity Utilization 39.5%		ICU Level of Service A	
Analysis Period (min) 15			

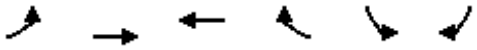
Splits and Phases: 2: Cummington Mall & Comm Ave

Lane Group	SBR
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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



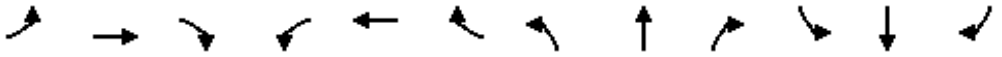
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	565	389	0	42	50
Future Volume (vph)	0	565	389	0	42	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.82	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3261	3001	0	1527	1366
Flt Permitted					0.950	
Satd. Flow (perm)	0	3261	3001	0	1249	1366
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						69
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)					109	112
Peak Hour Factor	0.92	0.94	0.88	0.92	0.69	0.72
Heavy Vehicles (%)	2%	7%	9%	2%	0%	0%
Parking (#/hr)			5		5	5
Adj. Flow (vph)	0	601	442	0	61	69
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	601	442	0	61	69
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.24	1.24
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		1	1		5	5
Permitted Phases						
Detector Phase		1	1		5	5
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)		10.0	10.0		8.0	8.0
Minimum Split (s)		24.0	24.0		24.0	24.0
Total Split (s)		71.0	71.0		29.0	29.0
Total Split (%)		71.0%	71.0%		29.0%	29.0%
Maximum Green (s)		65.0	65.0		23.0	23.0
Yellow Time (s)		4.0	4.0		3.0	3.0
All-Red Time (s)		2.0	2.0		3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		82.1	82.1		9.9	9.9
Actuated g/C Ratio		0.82	0.82		0.10	0.10
v/c Ratio		0.22	0.18		0.40	0.35
Control Delay		3.0	2.9		49.7	15.3
Queue Delay		0.3	0.0		0.0	0.0
Total Delay		3.3	2.9		49.7	15.3
LOS		A	A		D	B
Approach Delay		3.3	2.9		31.4	
Approach LOS		A	A		C	
Queue Length 50th (ft)		41	28		37	0
Queue Length 95th (ft)		69	49		57	23
Internal Link Dist (ft)		298	122		265	
Turn Bay Length (ft)						
Base Capacity (vph)		2677	2463		351	367
Starvation Cap Reductn		1380	0		0	0
Spillback Cap Reductn		0	0		0	0
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.46	0.18		0.17	0.19

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.40			
Intersection Signal Delay: 6.3		Intersection LOS: A	
Intersection Capacity Utilization 40.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Comm Ave & Granby St

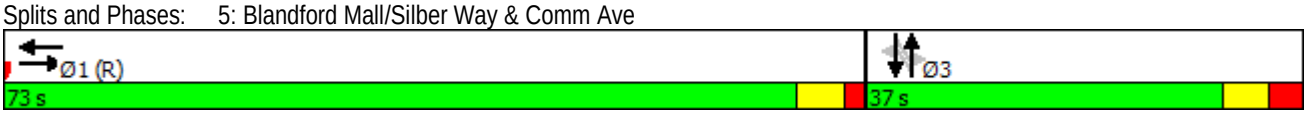


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	513	15	0	399	94	0	0	0	0	0	22
Future Volume (vph)	0	513	15	0	399	94	0	0	0	0	0	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.88						0.79	
Frt		0.994			0.967						0.865	
Flt Protected												
Satd. Flow (prot)	0	3197	0	0	2594	0	0	1863	0	0	1076	0
Flt Permitted												
Satd. Flow (perm)	0	3197	0	0	2594	0	0	1863	0	0	1076	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			60						157	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			108			212	394		232	232		111
Confl. Bikes (#/hr)			65			5			13			5
Peak Hour Factor	0.92	0.95	0.70	0.92	0.84	0.70	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	7%	7%	2%	9%	2%	2%	2%	2%	2%	2%	5%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	540	21	0	475	134	0	0	0	0	0	31
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	561	0	0	609	0	0	0	0	0	31	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA						NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		73.0			73.0		37.0	37.0		37.0	37.0	
Total Split (%)		66.4%			66.4%		33.6%	33.6%		33.6%	33.6%	
Maximum Green (s)		67.0			67.0		30.0	30.0		30.0	30.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		97.4			97.4						8.0	
Actuated g/C Ratio		0.89			0.89						0.07	
v/c Ratio		0.20			0.26						0.14	
Control Delay		1.9			2.0						1.3	
Queue Delay		0.0			0.0						0.0	
Total Delay		1.9			2.0						1.3	
LOS		A			A						A	
Approach Delay		1.9			2.0						1.3	
Approach LOS		A			A						A	
Queue Length 50th (ft)		36			38						0	
Queue Length 95th (ft)		49			47						0	
Internal Link Dist (ft)		520			878			243			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2831			2304						407	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.20			0.26						0.08	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 99 (90%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.26			
Intersection Signal Delay: 1.9		Intersection LOS: A	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	524	88	0	389	0	4
Future Vol, veh/h	524	88	0	389	0	4
Conflicting Peds, #/hr	0	257	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	80	92	88	92	70
Heavy Vehicles, %	7	3	2	9	2	0
Mvmt Flow	557	110	0	442	0	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	591
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	455
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	362
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	362	-	-	-
HCM Lane V/C Ratio	0.016	-	-	-
HCM Control Delay (s)	15.1	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	10.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	11	92	82	2	0	0	0	0	3	1
Future Vol, veh/h	0	0	11	92	82	2	0	0	0	0	3	1
Conflicting Peds, #/hr	68	0	103	103	0	68	0	0	0	59	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	70	73	70	70	92	92	92	92	75	70
Heavy Vehicles, %	2	2	18	0	3	0	2	2	2	2	0	0
Mvmt Flow	0	0	16	126	117	3	0	0	0	0	4	1

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	145	17	120	116	17	68			-	-	0
Stage 1	17	17	-	0	0	-			-	-	-
Stage 2	128	0	-	116	17	-			-	-	-
Critical Hdwy	7.12	6.52	6.38	7.1	6.53	6.2			-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.53	-			-	-	-
Follow-up Hdwy	3.518	4.018	3.462	3.5	4.027	3.3			-	-	-
Pot Cap-1 Maneuver	824	877	890	865	875	1001			0	-	-
Stage 1	1002	881	-	-	-	-			0	-	-
Stage 2	-	-	-	894	879	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	665	867	880	850	865	915			-	-	-
Mov Cap-2 Maneuver	665	867	-	850	865	-			-	-	-
Stage 1	1002	871	-	-	-	-			-	-	-
Stage 2	-	-	-	878	869	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	9.2	10.9	0
HCM LOS	A	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	880	858	-	-
HCM Lane V/C Ratio	0.018	0.287	-	-
HCM Control Delay (s)	9.2	10.9	-	-
HCM Lane LOS	A	B	-	-
HCM 95th %tile Q(veh)	0.1	1.2	-	-

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	45	144	6	53	27	0	0	10	1
Future Vol, veh/h	0	0	0	45	144	6	53	27	0	0	10	1
Peak Hour Factor	0.92	0.92	0.92	0.79	0.89	0.70	0.82	0.70	0.25	0.92	0.83	0.70
Heavy Vehicles, %	2	2	2	2	3	0	4	8	2	0	0	0
Mvmt Flow	0	0	0	57	162	9	65	39	0	0	12	1
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.8	8.3	7.6
HCM LOS	A	A	A

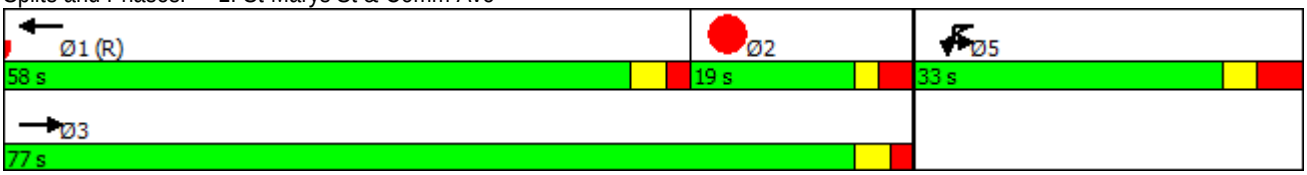
Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	66%	23%	0%
Vol Thru, %	34%	74%	91%
Vol Right, %	0%	3%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	80	195	11
LT Vol	53	45	0
Through Vol	27	144	10
RT Vol	0	6	1
Lane Flow Rate	103	227	13
Geometry Grp	1	1	1
Degree of Util (X)	0.133	0.263	0.017
Departure Headway (Hd)	4.635	4.164	4.486
Convergence, Y/N	Yes	Yes	Yes
Cap	778	850	802
Service Time	2.636	2.253	2.489
HCM Lane V/C Ratio	0.132	0.267	0.016
HCM Control Delay	8.3	8.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.5	1.1	0.1

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	683	95	84	121	787	0	0	
Future Volume (vph)	683	95	84	121	787	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.93			0.78				
Frt	0.983							
Flt Protected				0.950				
Satd. Flow (prot)	3022	0	0	1730	3067	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3022	0	0	1349	3067	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	26							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		242	359	242				
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.80	0.86	0.82	0.87	0.85	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	3%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	854	110	102	139	926	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	964	0	0	241	926	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	77.0		33.0	33.0	58.0			19.0
Total Split (%)	70.0%		30.0%	30.0%	52.7%			17%
Maximum Green (s)	72.0		26.0	26.0	53.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	77.8			20.2	58.8			
Actuated g/C Ratio	0.71			0.18	0.53			
v/c Ratio	0.45			0.76	0.56			
Control Delay	8.0			49.6	21.2			
Queue Delay	0.0			0.0	0.8			
Total Delay	8.0			49.6	22.0			
LOS	A			D	C			
Approach Delay	8.0				27.7			
Approach LOS	A				C			
Queue Length 50th (ft)	132			105	275			
Queue Length 95th (ft)	171			160	352			
Internal Link Dist (ft)	492				324	368		
Turn Bay Length (ft)				250				
Base Capacity (vph)	2145			408	1640			
Starvation Cap Reductn	0			0	397			
Spillback Cap Reductn	0			0	0			
Storage Cap Reductn	0			0	0			
Reduced v/c Ratio	0.45			0.59	0.74			

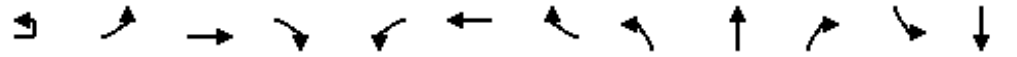
Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 95 (86%), Referenced to phase 1:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 18.8		Intersection LOS: B	
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: St Marys St & Comm Ave



Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	93	0	673	0	0	827	0	70	0	11	0	0
Future Volume (vph)	93	0	673	0	0	827	0	70	0	11	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.98				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3176	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1614	2952	0	0	3176	0	1585	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	7			369				7		271		
Peak Hour Factor	0.81	0.92	0.75	0.92	0.92	0.88	0.92	0.78	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	3%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	115	0	897	0	0	940	0	90	0	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	115	897	0	0	940	0	90	0	16	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	



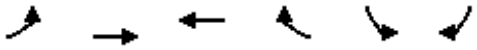
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	71.0			71.0		21.0		21.0		
Total Split (%)	16.4%	16.4%	64.5%			64.5%		19.1%		19.1%		
Maximum Green (s)	12.0	12.0	65.0			65.0		14.0		14.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		11.1	72.2			72.2		10.3		10.3		
Actuated g/C Ratio		0.10	0.66			0.66		0.09		0.09		
v/c Ratio		0.71	0.46			0.45		0.60		0.09		
Control Delay		65.0	10.7			7.1		63.8		0.9		
Queue Delay		0.0	0.4			0.2		0.0		0.0		
Total Delay		65.0	11.1			7.3		63.8		0.9		
LOS		E	B			A		E		A		
Approach Delay			17.2			7.3			54.3			
Approach LOS			B			A			D			
Queue Length 50th (ft)		80	145			71		62		0		
Queue Length 95th (ft)		#159	171			102		96		0		
Internal Link Dist (ft)			324			298			219			19
Turn Bay Length (ft)		120										
Base Capacity (vph)		182	1937			2084		205		224		
Starvation Cap Reductn		0	485			394		0		0		
Spillback Cap Reductn		0	0			258		0		0		
Storage Cap Reductn		0	0			0		0		0		
Reduced v/c Ratio		0.63	0.62			0.56		0.44		0.07		

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 59 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 14.6		Intersection LOS: B	
Intersection Capacity Utilization 48.0%		ICU Level of Service A	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

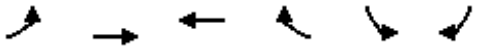
Splits and Phases: 2: Cummington Mall & Comm Ave

Lane Group	SBR
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
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



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	699	641	0	113	187
Future Volume (vph)	0	699	641	0	113	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor					0.72	
Frt						0.850
Flt Protected					0.950	
Satd. Flow (prot)	0	3388	3146	0	1527	1366
Flt Permitted					0.950	
Satd. Flow (perm)	0	3388	3146	0	1093	1366
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)						210
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)					155	230
Peak Hour Factor	0.92	0.78	0.88	0.92	0.90	0.89
Heavy Vehicles (%)	2%	3%	4%	2%	0%	0%
Parking (#/hr)			5		5	5
Adj. Flow (vph)	0	896	728	0	126	210
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	896	728	0	126	210
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.24	1.24
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	1
Detector Template		Thru	Thru		Left	Right
Leading Detector (ft)		100	100		20	20
Trailing Detector (ft)		0	0		0	0
Detector 1 Position(ft)		0	0		0	0
Detector 1 Size(ft)		6	6		20	20
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	0.0
Detector 1 Queue (s)		0.0	0.0		0.0	0.0
Detector 1 Delay (s)		0.0	0.0		0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type		NA	NA		Prot	Prot
Protected Phases		1	1		5	5
Permitted Phases						
Detector Phase		1	1		5	5
Switch Phase						



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Minimum Initial (s)		10.0	10.0		8.0	8.0
Minimum Split (s)		24.0	24.0		24.0	24.0
Total Split (s)		74.0	74.0		36.0	36.0
Total Split (%)		67.3%	67.3%		32.7%	32.7%
Maximum Green (s)		68.0	68.0		30.0	30.0
Yellow Time (s)		4.0	4.0		3.0	3.0
All-Red Time (s)		2.0	2.0		3.0	3.0
Lost Time Adjust (s)		0.0	0.0		0.0	0.0
Total Lost Time (s)		6.0	6.0		6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	3.0
Recall Mode		C-Max	C-Max		None	None
Walk Time (s)		7.0	7.0		7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0	0		0	0
Act Effct Green (s)		83.6	83.6		14.4	14.4
Actuated g/C Ratio		0.76	0.76		0.13	0.13
v/c Ratio		0.35	0.30		0.63	0.58
Control Delay		0.5	4.5		58.5	12.4
Queue Delay		0.1	0.0		0.0	0.0
Total Delay		0.6	4.5		58.5	12.5
LOS		A	A		E	B
Approach Delay		0.6	4.5		29.7	
Approach LOS		A	A		C	
Queue Length 50th (ft)		1	101		85	0
Queue Length 95th (ft)		1	114		141	62
Internal Link Dist (ft)		298	122		265	
Turn Bay Length (ft)						
Base Capacity (vph)		2573	2389		416	525
Starvation Cap Reductn		361	0		0	0
Spillback Cap Reductn		0	20		0	1
Storage Cap Reductn		0	0		0	0
Reduced v/c Ratio		0.41	0.31		0.30	0.40

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 68 (62%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 7.0		Intersection LOS: A	
Intersection Capacity Utilization 47.4%		ICU Level of Service A	
Analysis Period (min) 15			

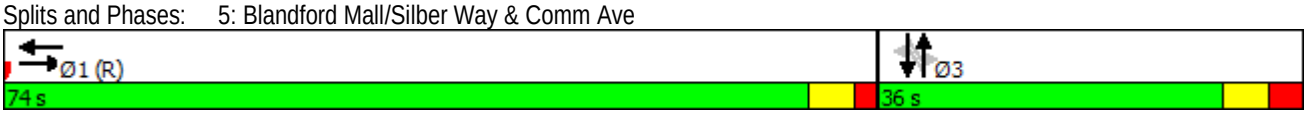
Splits and Phases: 3: Comm Ave & Granby St

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	783	20	0	584	122	0	0	0	2	2	61
Future Volume (vph)	0	783	20	0	584	122	0	0	0	2	2	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.88						0.65	
Frt		0.996			0.971						0.871	
Flt Protected											0.999	
Satd. Flow (prot)	0	3325	0	0	2697	0	0	1863	0	0	925	0
Flt Permitted											0.993	
Satd. Flow (perm)	0	3325	0	0	2697	0	0	1863	0	0	911	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14						53	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			255			378	514		421	421		320
Confl. Bikes (#/hr)			16			5			13			5
Peak Hour Factor	0.92	0.91	0.83	0.92	0.91	0.81	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	3%	0%	2%	4%	1%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	860	24	0	642	151	0	0	0	2	2	87
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	884	0	0	793	0	0	0	0	0	91	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type		NA			NA					Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		74.0			74.0		36.0	36.0		36.0	36.0	
Total Split (%)		67.3%			67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)		68.0			68.0		29.0	29.0		29.0	29.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		89.4			89.4						11.8	
Actuated g/C Ratio		0.81			0.81						0.11	
v/c Ratio		0.33			0.36						0.63	
Control Delay		3.3			4.5						40.7	
Queue Delay		0.0			0.0						0.0	
Total Delay		3.3			4.5						40.7	
LOS		A			A						D	
Approach Delay		3.3			4.5						40.7	
Approach LOS		A			A						D	
Queue Length 50th (ft)		79			68						26	
Queue Length 95th (ft)		162			137						76	
Internal Link Dist (ft)		520			878			243			297	
Turn Bay Length (ft)												
Base Capacity (vph)		2702			2193						279	
Starvation Cap Reductn		0			0						0	
Spillback Cap Reductn		0			0						0	
Storage Cap Reductn		0			0						0	
Reduced v/c Ratio		0.33			0.36						0.33	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 43 (39%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 5.8		Intersection LOS: A	
Intersection Capacity Utilization 48.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	2.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	755	59	0	641	0	54
Future Vol, veh/h	755	59	0	641	0	54
Conflicting Peds, #/hr	0	538	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	91	92	88	92	70
Heavy Vehicles, %	3	2	2	4	2	0
Mvmt Flow	888	65	0	728	0	77

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1015
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	240
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	138
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	60
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	138	-	-	-
HCM Lane V/C Ratio	0.559	-	-	-
HCM Control Delay (s)	60	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	2.8	-	-	-

Intersection	
Int Delay, s/veh	15.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕						↱	
Traffic Vol, veh/h	5	0	57	228	64	32	0	0	0	0	13	0
Future Vol, veh/h	5	0	57	228	64	32	0	0	0	0	13	0
Conflicting Peds, #/hr	50	0	252	252	0	50	0	0	0	160	0	68
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	92	78	96	81	70	92	92	92	92	70	70
Heavy Vehicles, %	0	2	0	0	0	3	2	2	2	0	0	0
Mvmt Flow	7	0	73	238	79	46	0	0	0	0	19	0

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	199	87	339	307	87	50			-	-	0
Stage 1	87	87	-	0	0	-			-	-	-
Stage 2	112	0	-	307	87	-			-	-	-
Critical Hdwy	7.1	6.52	6.2	7.1	6.5	6.23			-	-	-
Critical Hdwy Stg 1	6.1	5.52	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.1	5.5	-			-	-	-
Follow-up Hdwy	3.5	4.018	3.3	3.5	4	3.327			-	-	-
Pot Cap-1 Maneuver	764	803	708	649	807	1015			0	-	-
Stage 1	926	823	-	-	-	-			0	-	-
Stage 2	-	-	-	707	827	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	586	751	662	577	755	951			-	-	-
Mov Cap-2 Maneuver	586	751	-	577	755	-			-	-	-
Stage 1	926	770	-	-	-	-			-	-	-
Stage 2	-	-	-	629	773	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	11.3	17.6	0
HCM LOS	B	C	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBT	SBR
Capacity (veh/h)	654	642	-	-
HCM Lane V/C Ratio	0.123	0.564	-	-
HCM Control Delay (s)	11.3	17.6	-	-
HCM Lane LOS	B	C	-	-
HCM 95th %tile Q(veh)	0.4	3.5	-	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	97	199	14	97	34	0	0	15	13
Future Vol, veh/h	0	0	0	97	199	14	97	34	0	0	15	13
Peak Hour Factor	0.92	0.92	0.92	0.77	0.87	0.70	0.93	0.75	0.25	0.92	0.70	0.70
Heavy Vehicles, %	2	2	2	0	0	0	1	0	2	0	0	0
Mvmt Flow	0	0	0	126	229	20	104	45	0	0	21	19
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	11.1	9.3	8
HCM LOS	B	A	A

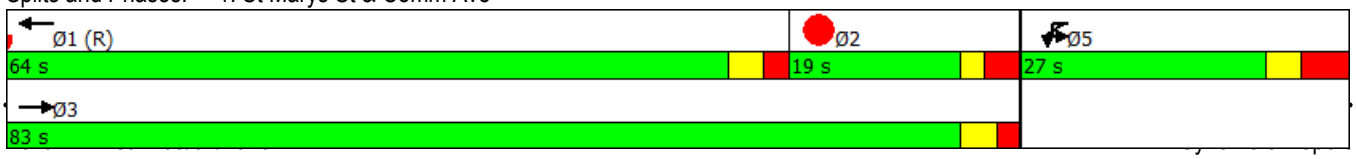
Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	74%	31%	0%
Vol Thru, %	26%	64%	54%
Vol Right, %	0%	5%	46%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	131	310	28
LT Vol	97	97	0
Through Vol	34	199	15
RT Vol	0	14	13
Lane Flow Rate	150	375	40
Geometry Grp	1	1	1
Degree of Util (X)	0.207	0.459	0.052
Departure Headway (Hd)	4.992	4.411	4.696
Convergence, Y/N	Yes	Yes	Yes
Cap	718	817	761
Service Time	3.025	2.434	2.736
HCM Lane V/C Ratio	0.209	0.459	0.053
HCM Control Delay	9.3	11.1	8
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.8	2.4	0.2

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	683	39	44	43	534	0	0	
Future Volume (vph)	683	39	44	43	534	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.96			0.79				
Frt	0.990							
Flt Protected				0.950				
Satd. Flow (prot)	3017	0	0	1686	2980	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3017	0	0	1330	2980	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	16							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		210	171	210				
Confl. Bikes (#/hr)		85						
Peak Hour Factor	0.87	0.70	0.73	0.70	0.87	0.92	0.92	
Heavy Vehicles (%)	7%	3%	7%	0%	6%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	785	56	60	61	614	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	841	0	0	121	614	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	83.0		27.0	27.0	64.0			19.0
Total Split (%)	75.5%		24.5%	24.5%	58.2%			17%
Maximum Green (s)	78.0		20.0	20.0	59.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	84.8			13.2	65.8			
Actuated g/C Ratio	0.77			0.12	0.60			
v/c Ratio	0.36			0.60	0.34			
Control Delay	4.7			51.5	19.0			
Queue Delay	0.0			0.0	0.5			
Total Delay	4.7			51.5	19.5			
LOS	A			D	B			
Approach Delay	4.7				24.8			
Approach LOS	A				C			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 57 (52%), Referenced to phase 1:WBT, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 14.1		Intersection LOS: B	
Intersection Capacity Utilization 40.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: St Marys St & Comm Ave



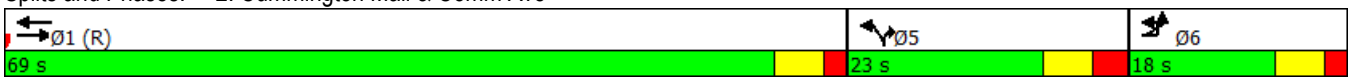
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	132	0	596	0	0	466	0	21	0	5	0	0
Future Volume (vph)	132	0	596	0	0	466	0	21	0	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.99				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3058	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1616	2952	0	0	3058	0	1602	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	3			235				3		147		
Peak Hour Factor	0.88	0.92	0.98	0.92	0.92	0.85	0.92	0.70	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	7%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	150	0	608	0	0	548	0	30	0	7	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	150	608	0	0	548	0	30	0	7	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	69.0			69.0		23.0		23.0		
Total Split (%)	16.4%	16.4%	62.7%			62.7%		20.9%		20.9%		
Maximum Green (s)	12.0	12.0	63.0			63.0		16.0		16.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		15.3	73.8			73.8		6.7		6.7		
Actuated g/C Ratio		0.14	0.67			0.67		0.06		0.06		
v/c Ratio		0.67	0.31			0.27		0.31		0.05		
Control Delay		54.0	16.2			9.2		56.8		0.6		
Queue Delay		0.0	0.3			0.3		0.0		0.0		
Total Delay		54.0	16.6			9.5		56.8		0.6		
LOS		D	B			A		E		A		
Approach Delay			24.0			9.5			46.2			
Approach LOS			C			A			D			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.67			
Intersection Signal Delay: 18.7		Intersection LOS: B	
Intersection Capacity Utilization 40.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Cummington Mall & Comm Ave



Lane Group	SBR
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

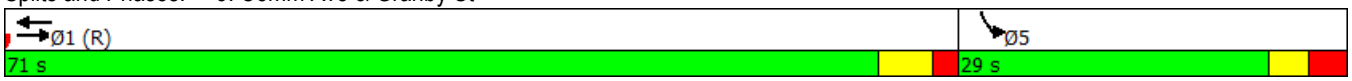
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	597	429	27	31	32
Future Volume (vph)	0	597	429	27	31	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.98		0.82	
Frt			0.990		0.933	
Flt Protected					0.975	
Satd. Flow (prot)	0	3261	2913	0	1510	0
Flt Permitted					0.975	
Satd. Flow (perm)	0	3261	2913	0	1371	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			15		44	
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)				126	109	112
Confl. Bikes (#/hr)				7		
Peak Hour Factor	0.92	0.94	0.88	0.80	0.69	0.72
Heavy Vehicles (%)	2%	7%	9%	2%	0%	0%
Parking (#/hr)			5			
Adj. Flow (vph)	0	635	488	34	45	44
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	635	522	0	89	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		100	100		20	
Trailing Detector (ft)		0	0		0	
Detector 1 Position(ft)		0	0		0	
Detector 1 Size(ft)		6	6		20	
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	
Detector 1 Queue (s)		0.0	0.0		0.0	
Detector 1 Delay (s)		0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Detector Phase		1	1		5	
Switch Phase						
Minimum Initial (s)		10.0	10.0		8.0	
Minimum Split (s)		24.0	24.0		24.0	
Total Split (s)		71.0	71.0		29.0	
Total Split (%)		71.0%	71.0%		29.0%	
Maximum Green (s)		65.0	65.0		23.0	
Yellow Time (s)		4.0	4.0		3.0	
All-Red Time (s)		2.0	2.0		3.0	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	
Recall Mode		C-Max	C-Max		None	
Walk Time (s)		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)		82.4	82.4		9.6	
Actuated g/C Ratio		0.82	0.82		0.10	
v/c Ratio		0.24	0.22		0.48	
Control Delay		3.0	2.9		32.5	
Queue Delay		0.3	0.0		0.0	
Total Delay		3.3	2.9		32.5	
LOS		A	A		C	
Approach Delay		3.3	2.9		32.5	
Approach LOS		A	A		C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 100			
Actuated Cycle Length: 100			
Offset: 54 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.48			
Intersection Signal Delay: 5.2		Intersection LOS: A	
Intersection Capacity Utilization 41.3%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Comm Ave & Granby St

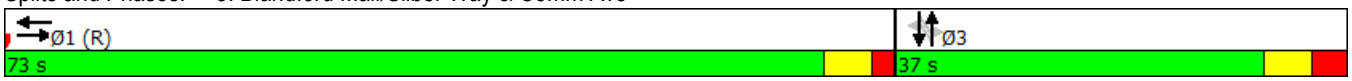


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	510	15	0	461	68	0	0	0	11	0	27
Future Volume (vph)	0	510	15	0	461	68	0	0	0	11	0	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.92						0.77	
Frt		0.994			0.977						0.897	
Flt Protected											0.988	
Satd. Flow (prot)	0	3197	0	0	2721	0	0	1863	0	0	1181	0
Flt Permitted											0.919	
Satd. Flow (perm)	0	3197	0	0	2721	0	0	1863	0	0	1015	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			33						39	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			108			212	394		232	232		111
Confl. Bikes (#/hr)			65			5			13			5
Peak Hour Factor	0.92	0.95	0.70	0.92	0.84	0.70	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	7%	7%	2%	9%	2%	2%	2%	2%	2%	2%	5%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	537	21	0	549	97	0	0	0	12	0	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	558	0	0	646	0	0	0	0	0	51	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA			NA					Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		73.0			73.0		37.0	37.0		37.0	37.0	
Total Split (%)		66.4%			66.4%		33.6%	33.6%		33.6%	33.6%	
Maximum Green (s)		67.0			67.0		30.0	30.0		30.0	30.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		92.1			92.1						9.1	
Actuated g/C Ratio		0.84			0.84						0.08	
v/c Ratio		0.21			0.28						0.43	
Control Delay		2.6			2.9						31.0	
Queue Delay		0.0			0.0						0.0	
Total Delay		2.6			2.9						31.0	
LOS		A			A						C	
Approach Delay		2.6			2.9						31.0	
Approach LOS		A			A						C	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 99 (90%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 3.9		Intersection LOS: A	
Intersection Capacity Utilization 42.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	517	116	0	456	0	8
Future Vol, veh/h	517	116	0	456	0	8
Conflicting Peds, #/hr	0	257	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	80	92	88	92	70
Heavy Vehicles, %	7	3	2	9	2	0
Mvmt Flow	550	145	0	518	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	605
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	446
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	355
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	355	-	-	-
HCM Lane V/C Ratio	0.032	-	-	-
HCM Control Delay (s)	15.5	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	11	63	56	2	27	0	0	0	3	1
Future Vol, veh/h	0	0	11	63	56	2	27	0	0	0	3	1
Peak Hour Factor	0.92	0.92	0.70	0.73	0.70	0.70	0.80	0.92	0.92	0.92	0.75	0.70
Heavy Vehicles, %	2	2	18	0	3	0	2	2	2	2	0	0
Mvmt Flow	0	0	16	86	80	3	34	0	0	0	4	1
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	6.6	8.1	7.7	7.2
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	0%	52%	0%
Vol Thru, %	0%	0%	46%	75%
Vol Right, %	0%	100%	2%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	27	11	121	4
LT Vol	27	0	63	0
Through Vol	0	0	56	3
RT Vol	0	11	2	1
Lane Flow Rate	34	16	169	5
Geometry Grp	1	1	1	1
Degree of Util (X)	0.042	0.015	0.191	0.006
Departure Headway (Hd)	4.459	3.529	4.075	4.097
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	793	1003	880	859
Service Time	2.542	1.589	2.101	2.19
HCM Lane V/C Ratio	0.043	0.016	0.192	0.006
HCM Control Delay	7.7	6.6	8.1	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0	0.7	0

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	61	115	6	27	27	0	0	10	1
Future Vol, veh/h	0	0	0	61	115	6	27	27	0	0	10	1
Peak Hour Factor	0.92	0.92	0.92	0.79	0.89	0.70	0.82	0.70	0.25	0.92	0.83	0.70
Heavy Vehicles, %	2	2	2	2	3	0	4	8	2	0	0	0
Mvmt Flow	0	0	0	77	129	9	33	39	0	0	12	1
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	8.6	8	7.5
HCM LOS	A	A	A

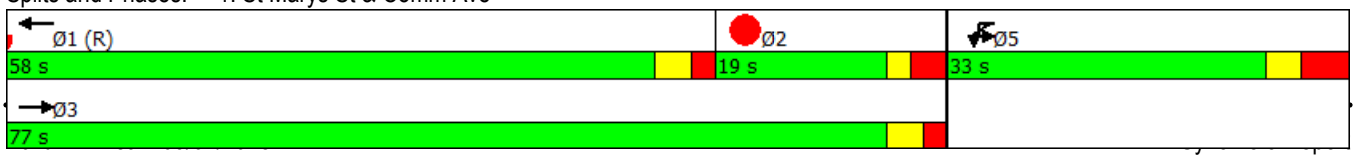
Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	50%	34%	0%
Vol Thru, %	50%	63%	91%
Vol Right, %	0%	3%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	54	182	11
LT Vol	27	61	0
Through Vol	27	115	10
RT Vol	0	6	1
Lane Flow Rate	71	215	13
Geometry Grp	1	1	1
Degree of Util (X)	0.091	0.247	0.017
Departure Headway (Hd)	4.571	4.129	4.415
Convergence, Y/N	Yes	Yes	Yes
Cap	789	862	815
Service Time	2.572	2.191	2.418
HCM Lane V/C Ratio	0.09	0.249	0.016
HCM Control Delay	8	8.6	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.3	1	0.1

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Lane Configurations								
Traffic Volume (vph)	703	95	90	124	808	0	0	
Future Volume (vph)	703	95	90	124	808	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	12	12	10	11	10	12	12	
Storage Length (ft)		0		250		0	0	
Storage Lanes		0		1		0	0	
Taper Length (ft)				25		25		
Lane Util. Factor	0.95	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	0.93			0.79				
Frt	0.983							
Flt Protected				0.950				
Satd. Flow (prot)	3028	0	0	1730	3067	0	0	
Flt Permitted				0.950				
Satd. Flow (perm)	3028	0	0	1362	3067	0	0	
Right Turn on Red		Yes					Yes	
Satd. Flow (RTOR)	25							
Link Speed (mph)	30				30	30		
Link Distance (ft)	572				404	448		
Travel Time (s)	13.0				9.2	10.2		
Confl. Peds. (#/hr)		242	359	242				
Confl. Bikes (#/hr)		18						
Peak Hour Factor	0.80	0.86	0.82	0.87	0.85	0.92	0.92	
Heavy Vehicles (%)	3%	0%	2%	0%	3%	2%	2%	
Parking (#/hr)	5				5			
Adj. Flow (vph)	879	110	110	143	951	0	0	
Shared Lane Traffic (%)								
Lane Group Flow (vph)	989	0	0	253	951	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	
Lane Alignment	Left	Right	R NA	Left	Left	Left	Right	
Median Width(ft)	55				55	0		
Link Offset(ft)	0				0	0		
Crosswalk Width(ft)	16				16	16		
Two way Left Turn Lane								
Headway Factor	1.09	1.00	1.09	1.04	1.19	1.00	1.00	
Turning Speed (mph)		9	9	15		15	9	
Number of Detectors	2		1	1	2			
Detector Template	Thru		Left	Left	Thru			
Leading Detector (ft)	100		20	20	100			
Trailing Detector (ft)	0		0	0	0			
Detector 1 Position(ft)	0		0	0	0			
Detector 1 Size(ft)	6		20	20	6			
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex			
Detector 1 Channel								
Detector 1 Extend (s)	0.0		0.0	0.0	0.0			
Detector 1 Queue (s)	0.0		0.0	0.0	0.0			
Detector 1 Delay (s)	0.0		0.0	0.0	0.0			
Detector 2 Position(ft)	94				94			
Detector 2 Size(ft)	6				6			

Lane Group	EBT	EBR	WBU	WBL	WBT	NBL	NBR	Ø2
Detector 2 Type	Cl+Ex				Cl+Ex			
Detector 2 Channel								
Detector 2 Extend (s)	0.0				0.0			
Turn Type	NA		Prot	Prot	NA			
Protected Phases	3		5	5	1			2
Permitted Phases								
Detector Phase	3		5	5	1			
Switch Phase								
Minimum Initial (s)	15.0		8.0	8.0	15.0			7.0
Minimum Split (s)	20.0		15.0	15.0	20.0			19.0
Total Split (s)	77.0		33.0	33.0	58.0			19.0
Total Split (%)	70.0%		30.0%	30.0%	52.7%			17%
Maximum Green (s)	72.0		26.0	26.0	53.0			14.0
Yellow Time (s)	3.0		3.0	3.0	3.0			2.0
All-Red Time (s)	2.0		4.0	4.0	2.0			3.0
Lost Time Adjust (s)	0.0			0.0	0.0			
Total Lost Time (s)	5.0			7.0	5.0			
Lead/Lag					Lead			Lag
Lead-Lag Optimize?					Yes			Yes
Vehicle Extension (s)	3.0		3.0	3.0	3.0			3.0
Recall Mode	Max		None	None	C-Max			Max
Walk Time (s)	10.0		3.0	3.0				7.0
Flash Dont Walk (s)	5.0		5.0	5.0				7.0
Pedestrian Calls (#/hr)	0		0	0				0
Act Effct Green (s)	77.3			20.7	58.3			
Actuated g/C Ratio	0.70			0.19	0.53			
v/c Ratio	0.46			0.78	0.59			
Control Delay	8.4			58.9	20.8			
Queue Delay	0.0			0.0	0.9			
Total Delay	8.4			58.9	21.8			
LOS	A			E	C			
Approach Delay	8.4				29.6			
Approach LOS	A				C			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 95 (86%), Referenced to phase 1:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.78			
Intersection Signal Delay: 20.0		Intersection LOS: C	
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: St Marys St & Comm Ave



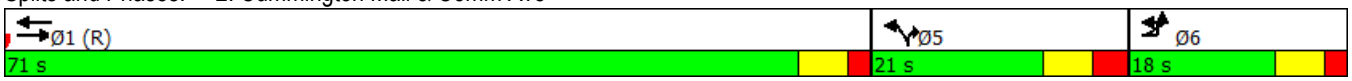
Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	99	0	703	0	0	838	0	83	0	11	0	0
Future Volume (vph)	99	0	703	0	0	838	0	83	0	11	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	10	10	10	11	11	12	12	12	12	12	12
Storage Length (ft)		120		0	0		0	0		0	0	
Storage Lanes		1		0	0		0	1		1	0	
Taper Length (ft)		25			25			25			25	
Lane Util. Factor	0.95	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00						0.98				
Frt										0.850		
Flt Protected		0.950						0.950				
Satd. Flow (prot)	0	1620	2952	0	0	3176	0	1612	0	1154	0	0
Flt Permitted		0.950						0.950				
Satd. Flow (perm)	0	1614	2952	0	0	3176	0	1585	0	1154	0	0
Right Turn on Red				Yes			Yes			Yes		
Satd. Flow (RTOR)										89		
Link Speed (mph)			30			30			30			30
Link Distance (ft)			404			378			299			99
Travel Time (s)			9.2			8.6			6.8			2.3
Confl. Peds. (#/hr)	7			369				7		271		
Peak Hour Factor	0.81	0.92	0.75	0.92	0.92	0.88	0.92	0.78	0.92	0.70	0.92	0.92
Heavy Vehicles (%)	4%	2%	7%	2%	2%	3%	2%	12%	2%	40%	2%	2%
Parking (#/hr)			5			5						
Adj. Flow (vph)	122	0	937	0	0	952	0	106	0	16	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	122	937	0	0	952	0	106	0	16	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left
Median Width(ft)			55			55			12			12
Link Offset(ft)			0			0			0			0
Crosswalk Width(ft)			16			16			16			16
Two way Left Turn Lane												
Headway Factor	1.00	1.09	1.19	1.09	1.04	1.13	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9	15		9	15		9	15		9	15	
Number of Detectors	1	1	2			2		1		1		
Detector Template	Left	Left	Thru			Thru		Left		Right		
Leading Detector (ft)	20	20	100			100		20		20		
Trailing Detector (ft)	0	0	0			0		0		0		
Detector 1 Position(ft)	0	0	0			0		0		0		
Detector 1 Size(ft)	20	20	6			6		20		20		
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex			Cl+Ex		Cl+Ex		Cl+Ex		
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Queue (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 1 Delay (s)	0.0	0.0	0.0			0.0		0.0		0.0		
Detector 2 Position(ft)			94			94						
Detector 2 Size(ft)			6			6						
Detector 2 Type			Cl+Ex			Cl+Ex						

Lane Group	SBR
Lane Configurations	
Traffic Volume (vph)	0
Future Volume (vph)	0
Ideal Flow (vphpl)	1900
Lane Width (ft)	12
Storage Length (ft)	0
Storage Lanes	0
Taper Length (ft)	
Lane Util. Factor	1.00
Ped Bike Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	0
Flt Permitted	
Satd. Flow (perm)	0
Right Turn on Red	Yes
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Confl. Peds. (#/hr)	
Peak Hour Factor	0.92
Heavy Vehicles (%)	2%
Parking (#/hr)	
Adj. Flow (vph)	0
Shared Lane Traffic (%)	
Lane Group Flow (vph)	0
Enter Blocked Intersection	No
Lane Alignment	Right
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	1.00
Turning Speed (mph)	9
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	

Lane Group	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Detector 2 Channel												
Detector 2 Extend (s)			0.0			0.0						
Turn Type	Prot	Prot	NA			NA		Prot		Prot		
Protected Phases	6	6	1			1		5		5		
Permitted Phases												
Detector Phase	6	6	1			1		5		5		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0			5.0		5.0		5.0		
Minimum Split (s)	11.0	11.0	25.0			25.0		12.0		12.0		
Total Split (s)	18.0	18.0	71.0			71.0		21.0		21.0		
Total Split (%)	16.4%	16.4%	64.5%			64.5%		19.1%		19.1%		
Maximum Green (s)	12.0	12.0	65.0			65.0		14.0		14.0		
Yellow Time (s)	4.0	4.0	4.0			4.0		4.0		4.0		
All-Red Time (s)	2.0	2.0	2.0			2.0		3.0		3.0		
Lost Time Adjust (s)		0.0	0.0			0.0		0.0		0.0		
Total Lost Time (s)		6.0	6.0			6.0		7.0		7.0		
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	2.0	2.0	3.0			3.0		2.0		2.0		
Recall Mode	None	None	C-Max			C-Max		None		None		
Walk Time (s)			7.0			7.0						
Flash Dont Walk (s)			11.0			11.0						
Pedestrian Calls (#/hr)			0			0						
Act Effct Green (s)		11.2	68.8			68.8		11.0		11.0		
Actuated g/C Ratio		0.10	0.63			0.63		0.10		0.10		
v/c Ratio		0.74	0.51			0.48		0.66		0.08		
Control Delay		68.6	11.9			6.3		66.2		0.8		
Queue Delay		0.0	0.5			0.1		0.0		0.0		
Total Delay		68.6	12.4			6.4		66.2		0.8		
LOS		E	B			A		E		A		
Approach Delay			18.9			6.4			57.6			
Approach LOS			B			A			E			

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 59 (54%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.74			
Intersection Signal Delay: 15.6		Intersection LOS: B	
Intersection Capacity Utilization 49.1%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Cummington Mall & Comm Ave



Lane Group	SBR
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	
Minimum Split (s)	
Total Split (s)	
Total Split (%)	
Maximum Green (s)	
Yellow Time (s)	
All-Red Time (s)	
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	
Lead-Lag Optimize?	
Vehicle Extension (s)	
Recall Mode	
Walk Time (s)	
Flash Dont Walk (s)	
Pedestrian Calls (#/hr)	
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	

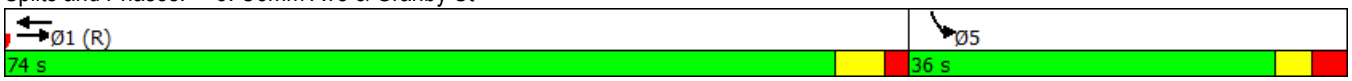
Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	719	718	49	84	121
Future Volume (vph)	0	719	718	49	84	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor			0.96		0.71	
Frt			0.990		0.920	
Flt Protected					0.980	
Satd. Flow (prot)	0	3388	2981	0	1332	0
Flt Permitted					0.980	
Satd. Flow (perm)	0	3388	2981	0	1178	0
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)			13		37	
Link Speed (mph)		30	30		30	
Link Distance (ft)		378	202		345	
Travel Time (s)		8.6	4.6		7.8	
Confl. Peds. (#/hr)				366	155	230
Confl. Bikes (#/hr)				48		
Peak Hour Factor	0.92	0.78	0.88	0.80	0.90	0.89
Heavy Vehicles (%)	2%	3%	4%	1%	0%	0%
Parking (#/hr)			5			
Adj. Flow (vph)	0	922	816	61	93	136
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	922	877	0	229	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		55	55		11	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.04	1.04	1.13	1.04	1.04	1.04
Turning Speed (mph)	15			9	15	9
Number of Detectors		2	2		1	
Detector Template		Thru	Thru		Left	
Leading Detector (ft)		100	100		20	
Trailing Detector (ft)		0	0		0	
Detector 1 Position(ft)		0	0		0	
Detector 1 Size(ft)		6	6		20	
Detector 1 Type		Cl+Ex	Cl+Ex		Cl+Ex	
Detector 1 Channel						
Detector 1 Extend (s)		0.0	0.0		0.0	
Detector 1 Queue (s)		0.0	0.0		0.0	
Detector 1 Delay (s)		0.0	0.0		0.0	
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Turn Type		NA	NA		Prot	
Protected Phases		1	1		5	
Permitted Phases						
Detector Phase		1	1		5	
Switch Phase						
Minimum Initial (s)		10.0	10.0		8.0	
Minimum Split (s)		24.0	24.0		24.0	
Total Split (s)		74.0	74.0		36.0	
Total Split (%)		67.3%	67.3%		32.7%	
Maximum Green (s)		68.0	68.0		30.0	
Yellow Time (s)		4.0	4.0		3.0	
All-Red Time (s)		2.0	2.0		3.0	
Lost Time Adjust (s)		0.0	0.0		0.0	
Total Lost Time (s)		6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0		3.0	
Recall Mode		C-Max	C-Max		None	
Walk Time (s)		7.0	7.0		7.0	
Flash Dont Walk (s)		11.0	11.0		11.0	
Pedestrian Calls (#/hr)		0	0		0	
Act Effct Green (s)		76.6	76.6		21.4	
Actuated g/C Ratio		0.70	0.70		0.19	
v/c Ratio		0.39	0.42		0.80	
Control Delay		0.5	7.6		54.0	
Queue Delay		0.1	0.0		0.0	
Total Delay		0.6	7.6		54.0	
LOS		A	A		D	
Approach Delay		0.6	7.6		54.0	
Approach LOS		A	A		D	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 68 (62%), Referenced to phase 1:EBWB, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 9.7		Intersection LOS: A	
Intersection Capacity Utilization 48.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Comm Ave & Granby St



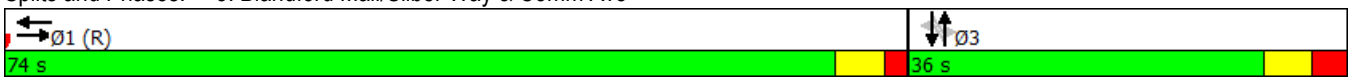
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	774	20	0	691	74	0	0	0	31	2	80
Future Volume (vph)	0	774	20	0	691	74	0	0	0	31	2	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	11	11	11	11	11	11	12	12	12	12	12	12
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.93						0.66	
Frt		0.996			0.984						0.897	
Flt Protected											0.989	
Satd. Flow (prot)	0	3324	0	0	2892	0	0	1863	0	0	1046	0
Flt Permitted											0.925	
Satd. Flow (perm)	0	3324	0	0	2892	0	0	1863	0	0	891	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14						40	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		600			958			323			377	
Travel Time (s)		13.6			21.8			7.3			8.6	
Confl. Peds. (#/hr)			255			378	514		421	421		320
Confl. Bikes (#/hr)			16			5			13			5
Peak Hour Factor	0.92	0.91	0.83	0.92	0.91	0.81	0.92	0.92	0.92	0.92	0.92	0.70
Heavy Vehicles (%)	0%	3%	0%	2%	4%	1%	2%	2%	2%	2%	2%	2%
Parking (#/hr)					5						5	
Adj. Flow (vph)	0	851	24	0	759	91	0	0	0	34	2	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	875	0	0	850	0	0	0	0	0	150	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		55			55			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.04	1.04	1.04	1.04	1.13	1.04	1.00	1.00	1.00	1.00	1.19	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2		1	2		1	2	
Detector Template		Thru			Thru		Left	Thru		Left	Thru	
Leading Detector (ft)		100			100		20	100		20	100	
Trailing Detector (ft)		0			0		0	0		0	0	
Detector 1 Position(ft)		0			0		0	0		0	0	
Detector 1 Size(ft)		6			6		20	6		20	6	
Detector 1 Type		Cl+Ex			Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Queue (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 1 Delay (s)		0.0			0.0		0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type		NA			NA					Perm	NA	
Protected Phases		1			1			3			3	
Permitted Phases							3			3		
Detector Phase		1			1		3	3		3	3	
Switch Phase												
Minimum Initial (s)		20.0			20.0		8.0	8.0		8.0	8.0	
Minimum Split (s)		26.0			26.0		25.0	25.0		25.0	25.0	
Total Split (s)		74.0			74.0		36.0	36.0		36.0	36.0	
Total Split (%)		67.3%			67.3%		32.7%	32.7%		32.7%	32.7%	
Maximum Green (s)		68.0			68.0		29.0	29.0		29.0	29.0	
Yellow Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)		2.0			2.0		3.0	3.0		3.0	3.0	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			7.0			7.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Recall Mode		C-Max			C-Max		None	None		None	None	
Walk Time (s)		7.0			7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)		11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)		0			0		0	0		0	0	
Act Effct Green (s)		78.0			78.0						19.0	
Actuated g/C Ratio		0.71			0.71						0.17	
v/c Ratio		0.37			0.41						0.81	
Control Delay		7.3			8.2						60.2	
Queue Delay		0.0			0.0						0.0	
Total Delay		7.3			8.2						60.2	
LOS		A			A						E	
Approach Delay		7.3			8.2						60.2	
Approach LOS		A			A						E	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 43 (39%), Referenced to phase 1:EBWB, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 48.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: Blandford Mall/Silber Way & Comm Ave



Intersection	
Int Delay, s/veh	3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	733	72	0	767	0	67
Future Vol, veh/h	733	72	0	767	0	67
Conflicting Peds, #/hr	0	538	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	91	92	88	92	70
Heavy Vehicles, %	3	2	2	4	2	0
Mvmt Flow	862	79	0	872	0	96

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1009
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.3
Pot Cap-1 Maneuver	-	-	0	-	0	242
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	139
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	74.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	139	-	-	-
HCM Lane V/C Ratio	0.689	-	-	-
HCM Control Delay (s)	74.6	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	3.9	-	-	-

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	57	133	16	32	49	0	0	0	13	0
Future Vol, veh/h	5	0	57	133	16	32	49	0	0	0	13	0
Peak Hour Factor	0.70	0.92	0.78	0.96	0.81	0.70	0.80	0.92	0.92	0.92	0.70	0.70
Heavy Vehicles, %	0	2	0	0	0	3	1	2	2	0	0	0
Mvmt Flow	7	0	73	139	20	46	61	0	0	0	19	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.1	8.5	8.2	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	8%	73%	0%
Vol Thru, %	0%	0%	9%	100%
Vol Right, %	0%	92%	18%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	62	181	13
LT Vol	49	5	133	0
Through Vol	0	0	16	13
RT Vol	0	57	32	0
Lane Flow Rate	61	80	204	19
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.084	0.235	0.024
Departure Headway (Hd)	4.749	3.768	4.141	4.586
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	758	955	857	784
Service Time	2.754	1.774	2.219	2.592
HCM Lane V/C Ratio	0.08	0.084	0.238	0.024
HCM Control Delay	8.2	7.1	8.5	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.3	0.9	0.1

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	145	104	14	49	34	0	0	15	13
Future Vol, veh/h	0	0	0	145	104	14	49	34	0	0	15	13
Peak Hour Factor	0.92	0.92	0.92	0.77	0.87	0.70	0.93	0.75	0.25	0.92	0.70	0.70
Heavy Vehicles, %	2	2	2	0	0	0	1	0	2	0	0	0
Mvmt Flow	0	0	0	188	120	20	53	45	0	0	21	19
Number of Lanes	0	0	0	0	1	0	0	1	0	0	1	0

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	1	0	1
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	10.1	8.6	7.8
HCM LOS	B	A	A

Lane	NBLn1	WBLn1	SBLn1
Vol Left, %	59%	55%	0%
Vol Thru, %	41%	40%	54%
Vol Right, %	0%	5%	46%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	83	263	28
LT Vol	49	145	0
Through Vol	34	104	15
RT Vol	0	14	13
Lane Flow Rate	98	328	40
Geometry Grp	1	1	1
Degree of Util (X)	0.132	0.394	0.05
Departure Headway (Hd)	4.841	4.33	4.502
Convergence, Y/N	Yes	Yes	Yes
Cap	742	836	796
Service Time	2.863	2.33	2.528
HCM Lane V/C Ratio	0.132	0.392	0.05
HCM Control Delay	8.6	10.1	7.8
HCM Lane LOS	A	B	A
HCM 95th-tile Q	0.5	1.9	0.2

TURNING MOVEMENT COUNT DATA

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280001.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280001
Comment 1: N/S Street : Granby St
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North				Bay State Rd From East				Granby St From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	0	0	17	6	1	0	0	0	0	0	1	0	8	0
07:15 AM	0	0	0	0	13	9	0	0	0	0	0	0	0	0	4	0
07:30 AM	0	1	0	0	19	10	0	0	0	0	0	0	0	0	2	0
07:45 AM	0	1	1	0	26	8	0	0	0	0	0	0	0	0	6	0
08:00 AM	0	1	0	0	29	10	0	0	0	0	0	0	0	0	2	0
08:15 AM	0	0	0	0	15	13	0	0	0	0	0	0	0	0	1	0
08:30 AM	0	1	0	0	17	25	1	0	0	0	0	0	0	0	3	0
08:45 AM	0	1	1	0	24	20	1	0	0	0	0	0	0	0	3	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	41	6	4	0	0	0	0	0	0	0	6	0
11:15 AM	0	1	0	0	35	7	1	0	0	0	0	0	1	0	10	0
11:30 AM	0	0	0	0	29	9	4	0	0	0	0	0	0	0	5	0
11:45 AM	0	2	0	0	28	8	4	0	0	0	0	0	0	0	9	0
12:00 PM	0	0	0	0	29	9	6	0	0	0	0	0	1	0	9	0
12:15 PM	0	2	1	1	33	7	5	0	0	0	0	0	0	0	7	0
12:30 PM	0	2	0	0	20	10	0	0	0	0	0	0	0	0	10	0
12:45 PM	0	1	0	0	26	10	3	0	0	0	0	0	2	0	12	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	2	0	0	34	6	12	0	0	0	0	1	4	0	12	0
04:15 PM	0	1	0	0	46	6	7	0	0	0	0	0	0	0	9	0
04:30 PM	0	1	0	0	61	8	2	0	0	0	0	0	0	0	12	0
04:45 PM	0	4	1	0	73	7	9	0	0	0	0	0	1	0	20	0
05:00 PM	0	1	0	0	57	11	11	0	0	0	0	0	1	1	18	0
05:15 PM	0	3	0	0	54	16	8	1	0	0	0	0	0	0	13	0
05:30 PM	0	4	0	0	54	10	7	0	0	0	0	0	2	0	14	0
05:45 PM	0	5	0	0	54	15	4	0	0	0	0	0	2	0	11	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280001.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280001
Comment 1: N/S Street : Granby St
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North				Bay State Rd From East				Granby St From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
07:45 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
08:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
08:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280001.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280001
Comment 1: N/S Street : Granby St
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North				Bay State Rd From East				Granby St From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	0	7	0	2	0	2	0	0	1	9	0	0	0	2
07:15 AM	0	0	0	7	0	1	0	4	0	0	1	5	1	0	0	2
07:30 AM	0	0	0	2	0	2	0	5	0	0	0	11	2	2	0	0
07:45 AM	0	0	0	10	1	2	0	13	0	0	1	31	2	0	0	2
08:00 AM	0	0	0	17	0	0	0	19	0	1	0	24	2	1	0	3
08:15 AM	0	0	0	9	0	1	0	8	1	0	0	17	0	0	0	1
08:30 AM	0	0	0	9	0	1	0	7	0	0	1	17	0	0	0	1
08:45 AM	0	0	0	33	1	8	0	25	0	0	0	45	1	0	0	7
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	22	1	2	0	7	0	0	0	107	0	0	0	0
11:15 AM	0	0	0	9	0	0	0	14	0	0	0	65	0	0	1	3
11:30 AM	0	0	0	9	2	0	0	17	0	0	0	63	1	0	0	5
11:45 AM	0	0	0	8	0	3	0	23	0	0	0	84	0	0	0	12
12:00 PM	0	0	0	44	2	0	0	35	0	0	1	100	0	1	0	22
12:15 PM	0	0	0	50	1	0	0	58	0	0	0	130	0	1	0	20
12:30 PM	0	0	0	33	2	1	0	10	0	0	0	59	0	0	0	17
12:45 PM	0	0	0	25	0	1	0	29	0	0	0	77	4	0	1	18
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	23	3	1	0	20	0	0	0	53	0	0	1	13
04:15 PM	0	0	0	13	0	0	0	16	1	1	0	51	0	1	2	20
04:30 PM	0	0	0	20	1	5	0	50	0	0	0	81	0	0	0	22
04:45 PM	0	0	0	33	1	3	0	53	0	0	1	124	1	0	0	26
05:00 PM	0	0	1	14	1	5	0	28	0	0	0	75	3	3	3	24
05:15 PM	0	0	0	3	3	1	0	47	0	0	0	65	1	0	1	10
05:30 PM	0	1	0	9	6	1	0	38	0	0	0	57	6	0	1	16
05:45 PM	0	0	1	24	6	4	0	47	0	1	0	55	4	2	1	18

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280002.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280002
Comment 1: N/S Street : Silber Way
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Wy From North				Bay State Rd From East				Silber Wy From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	0	0	7	13	0	0	10	0	0	0	0	0	1	0
07:15 AM	0	1	0	0	7	18	0	0	8	2	0	0	0	0	0	0
07:30 AM	0	3	1	1	11	24	1	0	11	1	0	0	0	0	0	0
07:45 AM	0	1	0	0	12	27	1	0	11	9	1	0	0	0	0	0
08:00 AM	0	1	1	0	10	35	1	0	9	3	2	0	0	0	0	1
08:15 AM	0	3	0	0	7	23	0	1	9	4	0	0	0	0	0	0
08:30 AM	0	3	0	0	12	37	3	0	13	10	0	0	0	0	0	0
08:45 AM	0	3	0	0	14	32	2	0	13	7	2	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	7	2	0	20	32	2	0	13	4	0	0	0	0	0	0
11:15 AM	0	3	1	0	14	26	6	0	17	4	0	0	0	0	0	0
11:30 AM	0	2	2	0	21	25	3	1	13	4	0	0	0	0	0	0
11:45 AM	0	7	3	0	17	21	5	1	16	3	1	0	0	0	0	0
12:00 PM	0	2	0	0	20	26	3	0	11	2	2	1	0	0	0	0
12:15 PM	0	3	1	0	23	32	2	1	17	2	1	0	0	0	0	0
12:30 PM	0	2	1	0	19	14	0	0	10	5	0	0	0	0	0	0
12:45 PM	0	3	0	0	18	24	0	0	15	3	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	7	5	0	17	35	3	0	10	3	0	0	0	0	0	0
04:15 PM	0	3	4	0	17	41	7	0	20	8	1	1	0	0	0	0
04:30 PM	0	2	3	0	29	47	3	0	25	11	0	0	0	0	0	0
04:45 PM	0	3	5	0	33	56	2	0	27	11	0	0	0	0	0	0
05:00 PM	0	1	6	0	31	47	1	0	23	9	0	0	0	0	0	0
05:15 PM	0	3	4	0	16	53	7	0	22	11	0	0	0	0	0	0
05:30 PM	0	6	1	0	22	45	4	0	23	6	0	0	0	0	0	0
05:45 PM	0	5	2	0	26	40	2	0	20	7	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280002.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280002
Comment 1: N/S Street : Silber Way
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Wy From North				Bay State Rd From East				Silber Wy From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
11:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0
11:45 AM	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280002.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280002
Comment 1: N/S Street : Silber Way
Comment 2: E/W Street : Bay State Road
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Wy From North				Bay State Rd From East				Silber Wy From South				Bay State Rd From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	1	0	9	0	2	0	3	0	4	1	4	1	0	0	3
07:15 AM	0	2	0	4	1	0	1	4	0	0	0	11	0	0	0	1
07:30 AM	0	1	0	11	0	0	0	7	0	0	0	22	0	0	0	5
07:45 AM	0	0	0	15	1	0	0	14	0	3	1	61	0	0	0	17
08:00 AM	0	1	0	13	1	0	1	6	0	2	0	21	0	1	0	8
08:15 AM	0	1	1	14	0	0	1	12	0	5	0	19	0	0	0	9
08:30 AM	0	3	0	6	1	1	1	5	0	5	0	33	0	0	0	8
08:45 AM	0	2	0	29	1	2	0	14	1	5	0	50	0	1	0	20
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	35	0	0	0	15	0	0	0	96	0	0	0	33
11:15 AM	0	0	1	26	0	0	1	13	1	1	0	84	0	1	0	31
11:30 AM	0	0	1	28	0	1	0	17	0	0	0	43	1	0	0	31
11:45 AM	0	1	0	54	0	2	0	36	0	0	0	71	0	1	1	34
12:00 PM	0	1	0	49	1	2	0	55	0	1	0	114	0	0	2	47
12:15 PM	0	0	0	60	4	2	0	63	0	0	1	131	0	2	0	89
12:30 PM	0	2	0	36	1	1	0	32	0	4	0	74	0	1	0	41
12:45 PM	0	1	0	34	1	1	0	50	0	1	0	91	0	0	0	48
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	1	2	13	1	2	3	14	0	1	0	27	0	0	0	14
04:15 PM	0	2	0	11	0	2	1	26	0	2	1	42	0	1	0	44
04:30 PM	0	0	0	26	1	1	1	34	0	2	0	61	0	1	0	44
04:45 PM	0	0	0	41	0	0	1	31	1	2	0	72	0	0	0	50
05:00 PM	0	2	1	39	2	1	3	56	0	8	0	60	0	1	0	47
05:15 PM	0	2	1	29	0	1	1	20	0	4	0	52	0	0	0	64
05:30 PM	1	5	0	41	0	4	0	31	0	3	0	31	0	0	0	42
05:45 PM	0	8	1	38	0	1	2	37	0	2	0	23	0	0	0	56

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280003.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280003
Comment 1: N/S Street : St. Marys Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			St Marys St From South			Comm Ave From West		
Start Time	Left	Thru	U-TR	Left	Right	Peds	Thru	Right	Peds
07:00 AM	16	93	7	0	0	0	55	2	0
07:15 AM	3	75	2	0	0	0	71	7	0
07:30 AM	3	101	2	0	0	0	116	7	0
07:45 AM	9	123	4	0	0	0	162	7	0
08:00 AM	11	106	9	0	0	0	129	5	0
08:15 AM	5	117	6	0	0	0	149	13	0
08:30 AM	2	121	5	0	0	0	169	4	0
08:45 AM	17	141	7	0	0	0	127	15	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	19	165	23	0	0	0	126	12	0
11:15 AM	18	137	17	0	0	0	102	8	0
11:30 AM	8	118	15	0	0	0	115	8	0
11:45 AM	22	141	21	0	0	0	103	6	0
12:00 PM	16	166	21	0	0	0	123	5	0
12:15 PM	21	163	24	0	0	0	156	12	0
12:30 PM	14	132	14	0	0	0	117	12	0
12:45 PM	14	110	13	0	0	0	112	8	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	17	205	14	0	0	0	97	16	0
04:15 PM	12	186	20	0	0	0	123	10	0
04:30 PM	36	159	15	0	0	0	125	11	0
04:45 PM	33	184	20	0	0	0	162	16	0
05:00 PM	34	211	15	0	0	0	129	22	0
05:15 PM	34	176	22	0	0	0	135	18	0
05:30 PM	20	178	19	0	0	0	176	27	0
05:45 PM	27	174	24	0	0	0	200	26	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280003.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280003
Comment 1: N/S Street : St. Marys Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			St Marys St From South			Comm Ave From West		
Start Time	Left	Thru	U-TR	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	2	1	0	0	0	11	0	0
07:15 AM	0	5	0	0	0	0	11	1	0
07:30 AM	0	8	0	0	0	0	9	0	0
07:45 AM	0	6	0	0	0	0	6	0	0
08:00 AM	0	9	1	0	0	0	11	0	0
08:15 AM	0	9	0	0	0	0	8	0	0
08:30 AM	0	6	1	0	0	0	9	1	0
08:45 AM	0	8	0	0	0	0	14	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	1	5	1	0	0	0	12	0	0
11:15 AM	0	7	1	0	0	0	6	0	0
11:30 AM	0	5	1	0	0	0	10	1	0
11:45 AM	0	6	0	0	0	0	7	0	0
12:00 PM	0	5	1	0	0	0	2	1	0
12:15 PM	1	2	0	0	0	0	9	0	0
12:30 PM	0	4	0	0	0	0	4	0	0
12:45 PM	1	3	1	0	0	0	3	1	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	2	0	0	0	0	8	0	0
04:15 PM	0	9	1	0	0	0	3	0	0
04:30 PM	0	4	0	0	0	0	6	0	0
04:45 PM	0	2	0	0	0	0	4	0	0
05:00 PM	0	7	1	0	0	0	6	0	0
05:15 PM	0	3	0	0	0	0	6	0	0
05:30 PM	0	5	0	0	0	0	2	0	0
05:45 PM	0	8	1	0	0	0	6	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280003.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280003
Comment 1: N/S Street : St. Marys Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			St Marys St From South			Comm Ave From West		
Start Time	Left	Thru	U-TR	Left	Right	Peds	Thru	Right	Peds
07:00 AM	1	1	0	1	0	0	5	1	0
07:15 AM	0	1	0	2	1	0	4	0	0
07:30 AM	0	0	0	2	0	0	14	0	0
07:45 AM	1	2	0	2	0	0	18	0	0
08:00 AM	1	0	0	1	1	0	21	2	0
08:15 AM	1	1	0	3	1	0	16	2	0
08:30 AM	1	4	0	1	3	0	24	1	0
08:45 AM	0	1	0	1	1	0	24	3	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	1	0	0	5	0	0
11:15 AM	0	1	0	0	1	0	8	1	0
11:30 AM	0	3	0	2	0	0	4	1	0
11:45 AM	0	4	0	0	0	0	6	0	0
12:00 PM	0	8	0	5	0	0	8	1	0
12:15 PM	0	5	0	0	11	0	6	0	0
12:30 PM	0	7	0	3	0	0	1	0	0
12:45 PM	0	6	0	1	0	0	5	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	9	0	1	0	0	2	0	0
04:15 PM	0	6	0	0	1	0	5	1	0
04:30 PM	0	14	0	0	0	0	6	0	0
04:45 PM	0	13	0	1	1	0	10	1	0
05:00 PM	0	10	0	0	0	0	4	1	0
05:15 PM	0	19	0	4	0	0	4	0	0
05:30 PM	0	20	0	2	0	0	6	0	0
05:45 PM	0	15	0	1	2	0	4	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280003.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280003
Comment 1: N/S Street : St. Marys Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			St Marys St From South			Comm Ave From West		
Start Time	NE	Thru	SE	Left	Right	Peds	NW	Right	SW
07:00 AM	30	0	15	0	0	11	36	0	22
07:15 AM	13	0	10	0	0	20	38	0	31
07:30 AM	36	0	37	0	0	37	67	0	58
07:45 AM	68	0	58	0	0	58	91	0	77
08:00 AM	32	0	25	0	0	56	78	0	47
08:15 AM	34	0	35	0	0	40	85	0	60
08:30 AM	45	0	36	0	0	57	69	0	57
08:45 AM	89	0	75	0	0	57	127	0	85
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	108	0	118	0	0	54	151	0	91
11:15 AM	55	0	44	0	0	58	83	0	63
11:30 AM	50	0	39	0	0	64	95	0	76
11:45 AM	77	0	62	0	0	74	125	0	108
12:00 PM	174	0	129	0	0	93	182	0	128
12:15 PM	199	0	222	0	0	73	207	0	246
12:30 PM	104	0	115	0	0	120	120	0	142
12:45 PM	74	0	109	0	0	103	152	0	170
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	79	0	84	0	0	91	147	0	143
04:15 PM	98	0	100	0	0	65	132	0	113
04:30 PM	91	0	82	0	0	79	123	0	89
04:45 PM	173	0	143	0	0	76	217	0	139
05:00 PM	116	0	85	0	0	47	149	0	131
05:15 PM	124	0	102	0	0	71	130	0	127
05:30 PM	90	0	80	0	0	67	140	0	123
05:45 PM	129	0	92	0	0	57	130	0	117

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280004.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280004
Comment 1: N/S Street : Cummington Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Cummington Mall From South			Comm Ave From West		
Start Time	Left	Thru	U-TR	Left	Right	Peds	Thru	Right	U-TR
07:00 AM	0	85	1	10	0	0	58	0	5
07:15 AM	0	75	0	4	1	0	67	0	2
07:30 AM	0	91	0	8	0	0	106	0	8
07:45 AM	0	104	0	4	0	0	137	0	27
08:00 AM	0	118	1	1	0	0	119	0	22
08:15 AM	0	77	1	9	2	0	124	0	35
08:30 AM	0	91	0	1	0	0	123	0	32
08:45 AM	0	118	0	4	1	0	118	0	33
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	177	0	9	5	0	124	0	25
11:15 AM	0	163	0	11	4	0	111	0	9
11:30 AM	0	137	0	5	5	0	128	0	8
11:45 AM	0	160	1	6	4	0	107	0	8
12:00 PM	0	174	0	10	6	0	131	0	15
12:15 PM	0	176	0	12	6	0	154	0	26
12:30 PM	0	148	0	10	2	0	117	0	13
12:45 PM	0	125	0	5	2	0	111	0	14
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	206	0	16	7	0	114	0	16
04:15 PM	0	175	0	13	3	0	134	0	17
04:30 PM	0	185	0	17	2	0	123	0	13
04:45 PM	0	200	0	20	4	0	162	0	33
05:00 PM	0	227	1	18	5	0	116	0	28
05:15 PM	0	208	2	10	3	0	142	0	19
05:30 PM	0	182	1	14	2	0	169	0	27
05:45 PM	0	182	0	16	1	0	213	0	17

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280004.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
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Comment 1: N/S Street : Cummington Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Cummington Mall From South			Comm Ave From West		
Start Time	Left	Thru	U-TR	Left	Right	Peds	Thru	Right	U-TR
07:00 AM	0	5	0	0	0	0	11	0	0
07:15 AM	0	6	0	1	0	0	6	0	1
07:30 AM	0	6	0	0	0	0	7	0	1
07:45 AM	0	6	0	0	1	0	3	0	3
08:00 AM	0	10	0	0	0	0	9	0	1
08:15 AM	0	10	0	1	1	0	6	0	1
08:30 AM	0	7	0	0	1	0	9	0	2
08:45 AM	0	4	0	1	0	0	11	0	1
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	4	0	0	0	0	10	0	0
11:15 AM	0	8	0	0	0	0	7	0	0
11:30 AM	0	9	0	1	1	0	9	0	0
11:45 AM	0	5	0	0	1	0	7	0	0
12:00 PM	0	5	0	0	0	0	2	0	0
12:15 PM	0	4	0	0	1	0	8	0	0
12:30 PM	0	4	0	1	1	0	4	0	0
12:45 PM	0	8	0	1	0	0	5	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	6	0	0	0	0	7	0	0
04:15 PM	0	9	0	0	0	0	5	0	0
04:30 PM	0	4	0	1	0	0	7	0	0
04:45 PM	0	2	0	0	0	0	4	0	0
05:00 PM	0	7	0	1	0	0	5	0	0
05:15 PM	0	2	0	0	0	0	6	0	0
05:30 PM	0	7	0	0	0	0	2	0	0
05:45 PM	0	7	0	0	0	0	6	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280004.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280004
Comment 1: N/S Street : Cummington Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Cummington Mall From South			Comm Ave From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	1	0	0	9	0	0
07:15 AM	0	2	0	0	0	0	7	0	0
07:30 AM	0	0	0	0	0	0	13	0	0
07:45 AM	0	3	0	0	0	0	20	0	0
08:00 AM	0	0	0	1	0	0	21	0	0
08:15 AM	0	1	0	0	0	0	17	1	0
08:30 AM	0	4	0	0	0	0	26	0	0
08:45 AM	0	2	0	0	0	0	20	0	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	2	0	0	0	0	9	1	0
11:15 AM	0	2	0	0	0	0	8	0	0
11:30 AM	0	2	0	1	0	0	5	0	0
11:45 AM	0	4	0	1	0	0	5	2	0
12:00 PM	0	9	0	1	0	0	13	2	0
12:15 PM	0	9	0	0	0	0	3	0	0
12:30 PM	0	3	0	2	0	0	6	0	0
12:45 PM	0	7	0	0	0	0	6	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	12	0	1	0	0	2	0	0
04:15 PM	0	7	0	3	0	0	6	0	0
04:30 PM	0	4	0	22	1	0	5	0	0
04:45 PM	0	7	0	5	0	0	3	0	0
05:00 PM	0	10	0	2	1	0	1	2	0
05:15 PM	0	24	0	2	0	0	0	0	0
05:30 PM	0	18	0	6	0	0	3	1	0
05:45 PM	0	25	0	2	0	0	5	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280004.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280004
Comment 1: N/S Street : Cummington Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Cummington Mall From South			Comm Ave From West		
Start Time	NE	Thru	SE	Left	Right	Peds	NW	Right	SW
07:00 AM	9	0	13	0	0	11	0	0	0
07:15 AM	3	0	3	0	0	27	0	0	0
07:30 AM	14	0	15	0	0	36	1	0	0
07:45 AM	49	0	43	0	0	55	0	0	0
08:00 AM	20	0	16	0	0	69	2	0	3
08:15 AM	19	0	31	0	0	31	1	0	1
08:30 AM	50	0	30	0	0	57	0	0	0
08:45 AM	79	0	70	0	0	78	0	0	1
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	79	0	78	0	0	77	0	0	1
11:15 AM	45	0	43	0	0	70	1	0	1
11:30 AM	61	0	54	0	0	75	0	0	0
11:45 AM	70	0	56	0	0	83	0	0	4
12:00 PM	177	0	176	0	0	94	0	0	2
12:15 PM	232	0	206	0	0	110	0	0	0
12:30 PM	101	0	86	0	0	81	1	0	4
12:45 PM	79	0	74	0	0	95	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	56	0	54	0	0	86	1	0	1
04:15 PM	96	0	87	0	0	88	2	0	2
04:30 PM	115	0	108	0	0	86	1	0	0
04:45 PM	177	0	133	0	0	100	0	0	0
05:00 PM	106	0	65	0	0	88	4	0	1
05:15 PM	68	0	66	0	0	91	2	0	3
05:30 PM	67	0	63	0	0	89	0	0	0
05:45 PM	105	0	77	0	0	101	1	0	1

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280005.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280005
Comment 1: N/S Street : Granby Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North			Comm Ave From East			Comm Ave From West		
Start Time	Left	Right	Peds	Thru	Right	U-TR	Left	Thru	U-TR
07:00 AM	5	20	0	63	0	0	0	54	0
07:15 AM	7	9	0	60	0	0	0	67	0
07:30 AM	11	9	0	81	0	0	0	100	0
07:45 AM	17	13	0	95	0	0	0	131	0
08:00 AM	9	17	0	93	0	0	0	115	0
08:15 AM	8	13	0	85	0	0	0	130	0
08:30 AM	6	11	0	64	0	0	0	123	0
08:45 AM	13	8	0	103	0	0	0	115	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	22	24	0	154	0	0	0	131	0
11:15 AM	17	26	0	126	0	0	0	114	0
11:30 AM	19	17	0	109	0	1	0	137	0
11:45 AM	18	22	0	136	0	2	0	112	0
12:00 PM	15	23	0	147	0	0	0	140	0
12:15 PM	17	26	0	152	0	0	0	162	1
12:30 PM	11	19	0	123	0	0	0	126	0
12:45 PM	13	20	0	105	0	0	0	113	1
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	14	28	0	165	0	0	0	119	0
04:15 PM	16	33	0	155	0	0	0	133	0
04:30 PM	26	45	0	138	0	1	0	134	1
04:45 PM	40	59	0	147	0	1	0	155	0
05:00 PM	26	49	0	171	0	0	0	126	0
05:15 PM	28	40	0	156	0	6	0	151	0
05:30 PM	29	45	0	130	0	0	0	170	0
05:45 PM	21	40	0	146	0	1	0	213	1

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280005.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280005
Comment 1: N/S Street : Granby Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North			Comm Ave From East			Comm Ave From West		
Start Time	Left	Right	Peds	Thru	Right	U-TR	Left	Thru	U-TR
07:00 AM	1	0	0	5	0	0	0	9	0
07:15 AM	0	0	0	8	0	0	0	6	0
07:30 AM	0	0	0	6	0	0	0	10	0
07:45 AM	1	0	0	6	0	0	0	9	0
08:00 AM	0	0	0	11	0	0	0	8	0
08:15 AM	0	0	0	11	0	0	0	8	0
08:30 AM	0	0	0	9	0	0	0	7	0
08:45 AM	0	0	0	5	0	0	0	14	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	4	0	0	0	15	0
11:15 AM	0	0	0	7	0	0	0	6	0
11:30 AM	1	2	0	7	0	0	0	10	0
11:45 AM	0	0	0	7	0	0	0	7	0
12:00 PM	0	0	0	3	0	0	0	4	0
12:15 PM	0	0	0	4	0	0	0	8	0
12:30 PM	0	0	0	4	0	0	0	4	0
12:45 PM	1	1	0	7	0	0	0	7	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	6	0	0	0	9	0
04:15 PM	1	0	0	9	0	0	0	4	0
04:30 PM	0	0	0	4	0	0	0	6	0
04:45 PM	0	0	0	3	0	0	0	3	0
05:00 PM	0	0	0	7	0	0	0	7	0
05:15 PM	0	0	0	2	0	0	0	6	0
05:30 PM	0	0	0	8	0	0	0	2	0
05:45 PM	0	0	0	6	0	0	0	7	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280005.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280005
Comment 1: N/S Street : Granby Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North			Comm Ave From East			Comm Ave From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
07:00 AM	0	0	0	0	0	0	0	9	0
07:15 AM	0	0	0	2	0	0	0	7	0
07:30 AM	0	0	0	0	0	0	1	9	0
07:45 AM	1	1	0	1	0	0	0	17	0
08:00 AM	0	0	0	1	0	0	0	19	0
08:15 AM	0	0	0	1	0	0	1	16	0
08:30 AM	1	0	0	3	0	0	0	24	0
08:45 AM	0	5	0	2	0	0	0	18	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	3	1	0	1	0	0	0	7	0
11:15 AM	0	0	0	1	0	0	0	6	0
11:30 AM	0	2	0	3	0	0	0	6	0
11:45 AM	0	0	0	4	0	0	0	4	0
12:00 PM	0	1	0	3	1	0	1	8	0
12:15 PM	0	0	0	6	0	0	0	6	0
12:30 PM	0	1	0	4	0	0	0	4	0
12:45 PM	0	1	0	4	0	0	0	4	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	2	0	9	0	0	0	3	0
04:15 PM	1	0	0	5	0	0	0	6	0
04:30 PM	0	2	0	5	1	0	0	9	0
04:45 PM	0	0	0	5	0	0	0	7	0
05:00 PM	1	4	0	6	0	0	0	4	0
05:15 PM	1	1	0	12	0	0	0	2	0
05:30 PM	1	6	0	13	0	0	0	9	0
05:45 PM	2	3	0	17	0	0	0	1	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280005.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280005
Comment 1: N/S Street : Granby Street
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Granby St From North			Comm Ave From East			Comm Ave From West		
Start Time	Left	Right	Peds	SE	Right	NE	SW	Thru	NW
07:00 AM	0	0	12	5	0	9	9	0	3
07:15 AM	0	0	11	6	0	6	8	0	7
07:30 AM	0	0	21	26	0	34	22	0	18
07:45 AM	0	0	47	30	0	35	62	0	51
08:00 AM	0	0	21	11	0	27	27	0	31
08:15 AM	0	0	22	15	0	25	30	0	19
08:30 AM	0	0	18	29	0	21	38	0	17
08:45 AM	0	0	65	54	0	62	75	0	45
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	87	43	0	49	97	0	77
11:15 AM	0	0	74	32	0	34	51	0	46
11:30 AM	0	0	79	47	0	40	60	0	54
11:45 AM	0	0	64	45	0	62	70	0	83
12:00 PM	0	0	132	88	0	110	120	0	93
12:15 PM	0	0	168	133	0	125	202	0	183
12:30 PM	0	0	104	62	0	60	70	0	61
12:45 PM	0	0	75	64	0	61	66	0	55
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	52	27	0	27	46	0	27
04:15 PM	0	0	69	21	0	18	67	0	42
04:30 PM	0	0	101	61	0	57	93	0	51
04:45 PM	0	0	180	90	0	85	114	0	121
05:00 PM	0	0	99	34	0	34	90	0	68
05:15 PM	0	0	82	36	0	22	71	0	47
05:30 PM	0	0	79	36	0	42	45	0	38
05:45 PM	0	0	106	49	0	62	90	0	77

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280006.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280006
Comment 1: N/S Street : Hinsdale Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Hinsdale Mall From South			Comm Ave From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	5	0	49	9	0
07:15 AM	0	0	0	0	2	0	54	14	0
07:30 AM	0	0	0	0	0	0	85	18	0
07:45 AM	0	0	0	0	1	0	119	14	0
08:00 AM	0	0	0	0	0	0	112	26	0
08:15 AM	0	0	0	0	3	0	112	19	0
08:30 AM	0	0	0	0	0	0	118	19	0
08:45 AM	0	0	0	0	1	0	103	19	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	1	0	131	12	0
11:15 AM	0	0	0	0	11	0	118	19	0
11:30 AM	0	0	0	0	1	0	131	10	0
11:45 AM	0	0	0	0	5	0	124	22	0
12:00 PM	0	0	0	0	4	0	128	11	0
12:15 PM	0	0	0	0	8	0	171	15	0
12:30 PM	0	0	0	0	2	0	110	13	0
12:45 PM	0	0	0	0	2	0	122	13	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	6	0	132	14	0
04:15 PM	0	0	0	0	7	0	142	9	0
04:30 PM	0	0	0	0	15	0	136	9	0
04:45 PM	0	0	0	0	10	0	173	18	0
05:00 PM	0	0	0	0	19	0	144	15	0
05:15 PM	0	0	0	0	9	0	165	16	0
05:30 PM	0	0	0	0	13	0	197	12	0
05:45 PM	0	0	0	0	12	0	215	14	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280006.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280006
Comment 1: N/S Street : Hinsdale Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Hinsdale Mall From South			Comm Ave From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	1	0	9	0	0
07:15 AM	0	0	0	0	1	0	6	0	0
07:30 AM	0	0	0	0	0	0	10	0	0
07:45 AM	0	0	0	0	0	0	9	1	0
08:00 AM	0	0	0	0	0	0	7	1	0
08:15 AM	0	0	0	0	0	0	8	0	0
08:30 AM	0	0	0	0	0	0	9	1	0
08:45 AM	0	0	0	0	0	0	10	1	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	10	1	0
11:15 AM	0	0	0	0	0	0	9	0	0
11:30 AM	0	0	0	0	0	0	11	0	0
11:45 AM	0	0	0	0	1	0	4	0	0
12:00 PM	0	0	0	0	0	0	7	0	0
12:15 PM	0	0	0	0	0	0	8	0	0
12:30 PM	0	0	0	0	0	0	5	0	0
12:45 PM	0	0	0	0	0	0	7	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	9	0	0
04:15 PM	0	0	0	0	0	0	5	0	0
04:30 PM	0	0	0	0	0	0	6	0	0
04:45 PM	0	0	0	0	0	0	3	0	0
05:00 PM	0	0	0	0	0	0	6	1	0
05:15 PM	0	0	0	0	0	0	6	0	0
05:30 PM	0	0	0	0	0	0	5	0	0
05:45 PM	0	0	0	0	0	0	4	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280006.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280006
Comment 1: N/S Street : Hinsdale Mall
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Comm Ave From East			Hinsdale Mall From South			Comm Ave From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
07:00 AM	0	0	0	0	0	9	12	0	0
07:15 AM	0	0	0	0	0	22	9	0	0
07:30 AM	0	0	0	0	0	31	10	0	0
07:45 AM	0	0	0	0	0	72	12	0	0
08:00 AM	0	0	0	0	0	21	24	0	0
08:15 AM	0	0	0	0	9	78	30	0	0
08:30 AM	0	0	0	0	0	39	32	3	0
08:45 AM	0	0	0	0	0	119	19	1	0
09:00 AM	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	142	9	2	0
11:15 AM	0	0	0	0	1	102	4	3	0
11:30 AM	0	0	0	0	0	104	3	0	0
11:45 AM	0	0	0	0	0	129	3	0	0
12:00 PM	0	0	0	0	1	219	12	3	0
12:15 PM	0	0	0	0	0	152	8	1	0
12:30 PM	0	0	0	0	1	131	10	0	0
12:45 PM	0	0	0	0	1	131	3	0	0
01:00 PM	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	125	3	0	0
04:15 PM	0	0	0	0	0	134	7	1	0
04:30 PM	0	0	0	1	0	152	9	0	0
04:45 PM	0	0	0	0	0	144	7	0	0
05:00 PM	0	0	0	0	0	156	9	0	0
05:15 PM	0	0	0	0	0	131	4	0	0
05:30 PM	0	1	0	0	0	142	4	0	0
05:45 PM	0	0	0	0	1	109	10	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280007.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280007
Comment 1: N/S Street : Silber Way / Blanford St
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Way From North				Comm Ave From East				Blanford Mall From South				Comm Ave From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	4	0	0	67	12	0	0	0	0	0	0	48	3	0
07:15 AM	0	0	4	0	0	63	15	0	0	0	0	0	0	62	0	0
07:30 AM	0	0	5	0	0	83	15	0	0	0	0	0	0	86	1	0
07:45 AM	0	0	7	0	0	93	17	0	0	0	0	0	0	121	2	0
08:00 AM	0	0	5	0	0	90	18	0	0	0	0	0	0	105	7	0
08:15 AM	0	0	2	0	0	73	14	0	0	0	0	0	0	118	2	0
08:30 AM	0	0	7	0	0	76	26	0	0	0	0	0	0	114	1	0
08:45 AM	0	0	7	0	0	110	32	0	0	0	0	0	0	112	4	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
11:00 AM	0	0	12	0	0	134	22	0	0	1	0	0	0	139	3	0
11:15 AM	0	0	5	0	0	127	28	0	0	0	1	0	0	113	3	0
11:30 AM	0	0	8	0	0	102	21	0	1	0	1	0	0	146	8	0
11:45 AM	0	0	13	0	0	119	24	0	0	0	2	0	0	108	1	0
12:00 PM	0	0	5	0	0	133	17	0	0	0	1	0	0	140	2	0
12:15 PM	0	0	10	0	0	133	26	0	0	0	1	0	0	161	7	0
12:30 PM	0	0	9	0	0	108	16	0	0	0	0	0	0	118	4	0
12:45 PM	0	0	13	0	0	92	23	0	0	0	0	0	0	115	4	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	13	0	0	160	26	0	0	0	0	0	0	134	5	0
04:15 PM	0	0	9	0	0	128	33	0	1	0	3	0	0	141	4	0
04:30 PM	0	0	10	0	0	119	28	0	0	0	0	0	0	144	3	0
04:45 PM	0	0	12	0	0	122	40	0	0	0	0	0	0	178	7	0
05:00 PM	0	0	25	0	0	151	28	0	0	0	0	0	0	158	5	0
05:15 PM	0	0	9	0	0	152	27	0	0	0	0	0	0	169	4	0
05:30 PM	0	0	12	0	0	116	36	0	0	0	0	0	0	199	6	0
05:45 PM	0	1	13	0	0	130	28	0	0	0	0	0	0	203	5	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280007.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280007
Comment 1: N/S Street : Silber Way / Blanford St
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Way From North				Comm Ave From East				Blanford Mall From South				Comm Ave From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	7	0	0
07:15 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	7	1	0
07:30 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	9	0	0
07:45 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	9	0	0
08:00 AM	0	0	0	0	0	12	0	0	0	0	0	0	0	5	0	0
08:15 AM	0	0	0	0	0	10	0	0	0	0	0	0	0	8	1	0
08:30 AM	0	0	1	0	0	9	0	0	0	0	0	0	0	9	0	0
08:45 AM	0	0	0	0	0	5	2	0	0	0	0	0	0	10	0	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	9	1	0
11:15 AM	0	0	1	0	0	7	1	0	0	0	0	0	0	6	0	0
11:30 AM	0	0	0	0	0	9	0	0	0	0	0	0	0	9	1	0
11:45 AM	0	0	0	0	0	8	0	0	0	0	0	0	0	9	0	0
12:00 PM	0	0	1	0	0	3	0	0	0	0	0	0	0	7	0	0
12:15 PM	0	0	1	0	0	4	0	0	0	0	0	0	0	7	0	0
12:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	4	1	0
12:45 PM	0	0	0	0	0	6	2	0	0	0	0	0	0	8	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	9	0	0
04:15 PM	0	0	0	0	0	9	0	0	0	0	0	0	0	5	0	0
04:30 PM	0	0	0	0	0	4	0	0	0	0	0	0	0	5	0	0
04:45 PM	0	0	0	0	0	3	0	0	0	0	0	0	0	4	0	0
05:00 PM	0	0	1	0	0	6	0	0	0	0	0	0	0	6	0	0
05:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	7	0	0
05:30 PM	0	0	0	0	0	8	1	0	0	0	0	0	0	5	0	0
05:45 PM	0	0	0	0	0	7	0	0	0	0	0	0	0	3	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280007.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280007
Comment 1: N/S Street : Silber Way / Blanford St
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Way From North				Comm Ave From East				Blanford Mall From South				Comm Ave From West			
Start Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
07:00 AM	0	0	1	0	0	1	1	0	0	0	0	0	4	6	0	0
07:15 AM	1	0	0	0	0	2	0	0	0	0	0	0	0	5	0	0
07:30 AM	1	1	3	0	0	0	0	0	0	0	0	0	0	9	1	0
07:45 AM	1	2	1	0	0	0	1	0	0	3	0	0	6	9	0	0
08:00 AM	1	0	3	0	0	1	0	0	0	4	0	0	2	18	0	0
08:15 AM	2	1	0	0	0	1	1	0	0	4	0	0	2	15	1	0
08:30 AM	2	2	0	0	1	3	0	0	0	2	0	0	5	17	0	0
08:45 AM	2	2	1	0	0	0	1	0	0	3	0	0	3	15	3	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	6	0	0
11:15 AM	0	0	0	0	0	3	0	0	0	1	0	0	0	4	1	0
11:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	5	0	0
11:45 AM	2	0	0	0	0	3	0	0	0	0	0	0	0	6	0	0
12:00 PM	0	0	0	0	0	2	3	0	0	2	0	0	0	11	3	0
12:15 PM	0	1	0	0	0	6	4	0	0	1	0	0	0	6	1	0
12:30 PM	0	2	0	0	0	4	0	0	0	0	0	0	0	2	0	0
12:45 PM	0	0	0	0	0	4	1	0	0	0	1	0	1	3	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	3	1	1	0	0	8	0	0	0	0	0	0	1	2	0	0
04:15 PM	1	0	6	0	0	4	1	0	0	2	0	0	2	5	0	0
04:30 PM	2	2	0	0	0	3	0	0	0	1	0	0	1	6	0	0
04:45 PM	0	0	0	0	0	5	0	0	0	0	0	0	0	4	4	0
05:00 PM	2	2	0	0	0	5	0	0	0	2	0	0	3	6	0	0
05:15 PM	2	0	4	0	0	10	1	0	1	1	0	0	1	1	1	0
05:30 PM	1	0	3	0	0	7	0	0	1	0	0	0	0	5	0	0
05:45 PM	4	0	4	0	0	13	1	0	1	1	0	0	0	4	0	0

File Name: C:\Users\stevi\Documents\2018\Petra\Boston\AECOM\60551628\16280007.ppd
Start Date: 4/12/2018
Start Time: 7:00:00 AM
Site Code: 16280007
Comment 1: N/S Street : Silber Way / Blanford St
Comment 2: E/W Street : Commonwealth Avenue
Comment 3: City/State : Boston, MA
Comment 4: Weather : Cloudy

	Silber Way From North				Comm Ave From East				Blanford Mall From South				Comm Ave From West			
Start Time	Left	Thru	Right	Peds	SE	Thru	Right	NE	Left	Thru	Right	Peds	SW	Thru	Right	NW
07:00 AM	0	0	0	16	6	0	0	12	0	0	0	6	4	0	0	10
07:15 AM	0	0	0	17	25	0	0	31	0	0	0	20	8	0	0	11
07:30 AM	0	0	0	37	29	0	0	57	0	0	0	10	12	0	0	13
07:45 AM	0	0	0	75	115	0	0	194	0	0	0	29	32	0	0	47
08:00 AM	0	0	0	49	54	0	0	96	0	0	0	29	15	0	0	36
08:15 AM	0	0	0	43	38	0	0	60	0	0	0	15	17	0	0	23
08:30 AM	0	0	0	56	51	0	0	80	0	0	0	26	25	0	0	24
08:45 AM	0	0	0	64	89	0	0	158	0	0	0	38	30	0	0	28
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	121	122	0	0	139	0	0	0	43	30	0	0	53
11:15 AM	0	0	0	115	52	0	0	67	0	0	0	36	24	0	0	50
11:30 AM	0	0	0	77	99	0	0	123	0	0	0	29	21	0	0	50
11:45 AM	0	0	0	99	103	0	0	142	0	0	0	75	35	0	0	53
12:00 PM	0	0	0	209	172	0	0	155	0	0	0	79	70	0	0	65
12:15 PM	0	0	0	192	199	0	0	245	0	0	0	111	72	0	0	137
12:30 PM	0	0	0	113	118	0	0	157	0	0	0	66	31	0	0	60
12:45 PM	0	0	0	127	106	0	0	131	0	0	0	60	38	0	0	54
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	84	85	0	0	90	0	0	0	44	22	0	0	48
04:15 PM	0	0	0	102	83	0	0	84	0	0	0	46	29	0	0	76
04:30 PM	0	0	0	143	117	0	0	203	0	0	0	63	35	0	0	144
04:45 PM	0	0	0	162	157	0	0	200	0	0	0	62	58	0	0	86
05:00 PM	0	0	0	87	108	0	0	145	0	0	0	72	31	0	0	86
05:15 PM	0	0	0	88	97	0	0	134	0	0	0	67	25	0	0	68
05:30 PM	0	0	0	80	97	0	0	127	0	0	0	60	26	0	0	81
05:45 PM	0	0	0	123	119	0	0	108	0	0	0	56	33	0	0	85

Attachment F

ENERGY MODEL

Boston University Data Sciences Center

Boston, MA

Progress Design Development
Energy Analysis Report

Prepared For:

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March 29, 2019

Table of Contents

Executive Summary

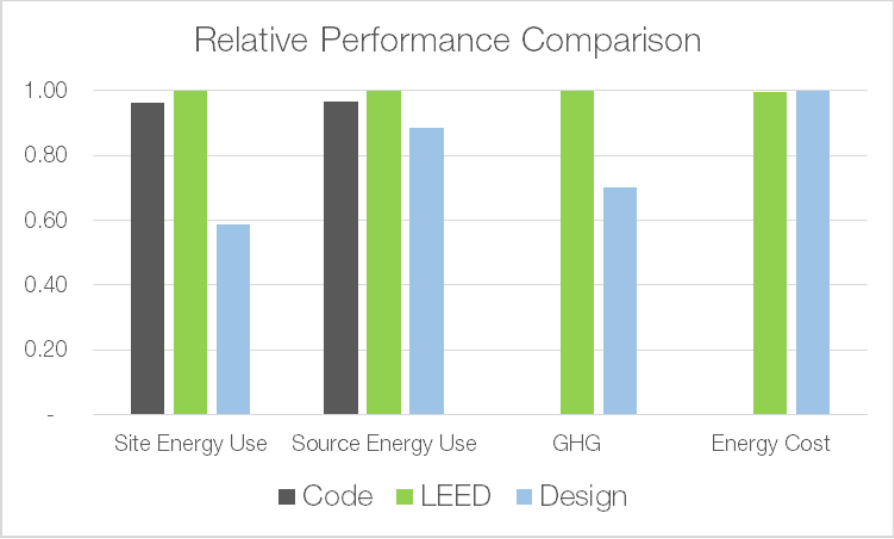
The Data Sciences Center project at Boston University includes the construction of an approximately 368,000 GSF mixed-use high-rise office building at 665 Commonwealth Ave. in Boston, MA. The project consists of 2 below-grade levels, a podium consisting of five (5) stories, and an eleven (11) story tower that will house classrooms, collaboration spaces, computer labs, research spaces, meeting rooms, a café, receiving, and mechanical space. The project is currently completing Design Development phase. Boston University has decided to pursue certification under the LEED for New Construction v4 rating system, targeting LEED Gold at minimum and considering the higher goal of Platinum.

The building systems have been extensively studied by the design team and have been selected to maximize energy efficiency while providing essential heating, cooling, and ventilation needs. Plumbing fixtures with low flush and flow rates will be specified to minimize the demand for potable water for sewage conveyance and process uses.

The Green Engineer (TGE) performed building energy analysis comparing the design to two different baselines. The first baseline references ASHRAE 90.1-2013, Appendix G, plus the Massachusetts stretch energy code amendment (9th edition). In order to comply with stretch code, the as-designed building must outperform the code baseline by 10% on a site or source energy basis. **Preliminary results indicate the building outperforms the code baseline by 34% on a site energy basis, confirming stretch code compliance**.

The second baseline also references ASHRAE 90.1-2013, Appendix G, however the MA stretch code provisions are removed. This baseline can be used for LEEDv4 projects to determine the number of points earned under the "Optimize Energy Performance" credit. The project is targeting ten points under this credit, which requires a 24% improvement over the LEED baseline. **Preliminary results indicate the building outperforms the LEED baseline by 25%, based upon an average of source energy and GHG emissions reductions**. This is sufficient to earn 10 points under the Optimize Energy Performance credit.

Figure 1: Building Performance Summary



I. Description of Comparison

Code Baseline Case: The baseline case model is an energy code equivalent representation of the building, assuming minimum compliance with ASHRAE Standard 90.1-2013, Appendix G, plus the Massachusetts stretch code amendment. Model input parameters are taken from the standard, rather than design documents. According to the stretch code amendment, two IECC 2015 C406.1 additional efficiency measures (AEM's) must be applied. The AEM's applied to this baseline include a 10% reduction in the lighting power density allowance and a 0.5 W/SF of installed solar PV capacity.

LEED Baseline Case: As stated in the executive summary, the LEED baseline case is identical to the code baseline, except that the Massachusetts stretch code provisions are removed. Two additional conversions are then applied to convert energy performance into equivalent LEED performance. First, a LEED pilot credit (EApc95) is enacted, allowing performance to be based on a combination of source energy savings and greenhouse gas reductions, rather than the typical energy cost metric. This approach is especially advantageous for projects using heat pumps since this application leverages the New England electric grid, which is amongst the cleanest in the nation. Secondly, applying LEED Interpretation 10481 allows projects to add an additional performance savings credit for using a newer energy code.

Design Case: Design case model inputs are based on the Progress Design Development drawings and documents, and information provided by the design team. Individual design elements may be better or worse than code requirements in all instances, so long as aggregate building energy performance exceeds baseline case energy performance. Every effort has been made to use reasonable assumptions for building components and systems where details were not available.

Please refer to Appendix-A for model inputs.

II. Energy Conservation Measures

The following ECM's have been identified for the project:

- Diagonal louvers and "sawtooth" shading fins
- Reduced interior lighting through the use of high efficiency LED fixtures
- Geothermal heat recovery chillers
- Active chilled beams
- Dedicated outdoor air system with high efficiency energy recovery
- Low flow plumbing fixtures

III. Simulation Results

Tables 1 and 2 provide a comparison of the proposed design against the 9th edition stretch energy code baseline. Stretch code compliance requires projects to exceed the base energy code, plus MA amendments, by 10% on a site or source energy basis. Site energy savings of 38% shown in table 2 confirm compliance with stretch code.

Table 2: Energy Code Baseline

BASELINE CASE: ASHRAE 90.1-2013 + MA Stretch Code Amendment				
Category	Electricity [MBtu]	Natural Gas [MBtu]	Subtotal [MBtu]	EUI (kBtu/SF)
Heating	-	12,087	12,087	38.0
Cooling	816	-	816	2.6
Interior Lighting	2,104	-	2,104	6.6
Exterior Lighting	74	-	74	0.2
Interior Equipment	3,248	-	3,248	10.2
Fans	2,632	-	2,632	8.3
Pumps	453	-	453	1.4
Heat Rejection	109	-	109	0.3
Water Systems	526	-	526	1.7
Total End Uses	9,962	12,087	22,049	69.3
C406.1-4 Credit			678.11	2.1
Total Site Energy Use			21,371	67.2
Total Source Energy Use	27,894.20	12,690.94	39,907	127.6

Table 1: Designed Savings over Energy Code

DESIGN CASE: DD Progress Set				
Category	Electricity [MBtu]	Natural Gas [MBtu]	Subtotal [MBtu]	EUI (kBtu/SF)
Heating	627	-	627	2.0
Cooling	1,528	-	1,528	4.8
Interior Lighting	2,005	-	2,005	6.3
Exterior Lighting	74	-	74	0.2
Interior Equipment	3,269	-	3,269	10.3
Fans	4,297	-	4,297	13.5
Pumps	934	-	934	2.9
Water Systems	460	-	460	1.4
Total End Uses	13,196	-	13,196	41.5
Total Site Energy Savings			38%	
Total Source Energy Use	36,948.53	-	36,949	
Total Source Energy Savings			7.4%	

Tables 3 and 4 provide a comparison of the proposed design against the LEED baseline. As previously mentioned, the design remains unchanged, but the baseline reverts to "stock" code and new performance metrics are introduced. Under a pilot credit, projects can elect to take the average savings of their two best performance metrics amongst a slew of choices. Projects in New England using heat pumps show their best performance when using a combination of source energy savings and greenhouse gas reductions due to the exceptionally clean grid (by national standards). Following this path, the project achieves 24% savings, which is sufficient for 10 points under the energy performance credit.

Table 4: LEED Baseline Case

BASELINE CASE: ASHRAE 90.1-2013 (LEED)				
Category	Electricity [MBtu]	Natural Gas [MBtu]	Subtotal [MBtu]	EUI (kBtu/SF)
Heating	-	11,974	11,974	37.7
Cooling	829	-	829	2.6
Interior Lighting	2,326	-	2,326	7.3
Exterior Lighting	74	-	74	0.2
Interior Equipment	3,248	-	3,248	10.2
Fans	2,664	-	2,664	8.4
Pumps	461	-	461	1.4
Heat Rejection	110	-	110	0.3
Water Systems	526	-	526	1.7
Total End Uses	10,238	11,974	22,211	69.9
Total Source Energy	28,666	12,572	41,238	129.7
Total GHG (kG CO2)	784,926	635,926	1,420,851	
Total Energy Cost	$ 446,475	117,941.40	564,416	

Table 3: Designed Savings over LEED Baseline

DESIGN CASE: DD Progress Set				
Category	Electricity [MBtu]	Natural Gas [MBtu]	Subtotal [MBtu]	EUI (kBtu/SF)
Heating	627	-	627	2.0
Cooling	1,528	-	1,528	4.8
Interior Lighting	2,005	-	2,005	6.3
Exterior Lighting	74	-	74	0.2
Interior Equipment	3,269	-	3,269	10.3
Fans	4,297.24	-	4,297	13.5
Pumps	934	-	934	2.9
Water Systems	460	-	460	1.4
Total End Uses	13,196	-	13,196	41.5
End Use Savings			41%	
Total Source Energy	36,949	-	36,949	
Source Energy Savings			10%	
Total GHG (kG CO2)	1,011,730	-	1,011,730	
GHG Savings			29%	
Total Energy Cost	$ 575,484	-	$ 575,484	
Energy Cost Savings			-2%	
LEED Savings			24.6%	
LEED Points			10	

IV. Discussion of Results

Key Performance Advantages

- Performance of the building hinges upon how much of the annual heating and cooling loads can be met by the geothermal system. The basis of design assumes 380 Tons of geothermal cooling capacity. It's assumed that 80% of this (or 304 Tons) will be available for heating capacity under design heating conditions. Based on current assumptions and typical weather year data, this is sufficient to satisfy the majority of annual heating and cooling loads. It should also be noted that geothermal performance is extremely sensitive to soil properties. For more realistic results, a ground thermal conductivity test should be performed and the resulting soil properties should be incorporated into this analysis.

Identified Performance Opportunities

- Envelope – Relative to a code compliant baseline, the proposed envelope introduces more heating and cooling loads to the space. Reducing the window to wall ratio closer to the baseline allowance of 40% will help minimize this impact. Furthermore, the curtain wall spandrel assemblies also introduce more loads into the space. If possible, substituting spandrel assemblies with an assembly that experiences less thermal bridging would have a significant impact.
- Fans – As the single largest regulated end-use, installed fan power and controls have a significant impact on overall building performance. Small terminal unit fans should be specified with wire to air efficiencies of 0.3 w/cfm. Based on current autosized results of terminal fans, specified at 0.4 w/cfm, the total terminal fan demand is about 50% larger than the central AHU's. TGE will work with BR+A to confirm sequences moving forward and help identify any opportunities to minimize flow requirements when appropriate.
- Pumps – Hydronic loops appear to be sized at pressures exceeding 100 Ft-Hd. There may be an opportunity to reduce total loop pressure requirements once detailed calculations are performed. Ground heat exchangers specifically, can often be sized under 40 Ft-Hd, even after antifreeze penalties have been factored in.
- Radiators – Although radiators would impart additional cost and pumping requirements, partial up front and operational savings may be gleaned if fan powered boxes and fan coils can be omitted. Operational savings are possible by avoiding nighttime setback fan operation. This is particularly beneficial in cases where envelope losses are relatively high and require additional input to offset night time setback loads.

Recommended Next Steps

- TGE will continue to work with the design team to confirm energy modeling assumptions and identify performance improvement opportunities.
    - Specifically, TGE will coordinate with BR+A to confirm HVAC control optimization
- Design team members should continue to include TGE on design decisions effecting energy performance.

V. Modeling Methodology

The energy analysis was conducted using DesignBuilder v5.5, which serves as a graphical user interface for Energy Plus v8.6, a simulation engine developed and supported on an ongoing basis by the US Department of Energy. DesignBuilder estimates annual energy consumption by simulating a year of building operations based on a typical weather year and user-defined design specifications. This phase of analysis reflects design input provided by the project team in the form of design documents, specifications, conference call discussions and email correspondence. The geometry of the building is based on the architectural floor plans, except that window configurations are simplified based on a percentage glazing in each zone and exposure.

The prescribed methodology requires a baseline building model that conforms to the minimum code requirements as defined by ASHRAE 90.1-2013 Appendix G, plus Massachusetts amendments as applicable. Once the baseline model has been created according to code requirements, a proposed case model is built reflecting the latest design documents. An abbreviated list of energy modeling inputs has been provided at the end of this report.

It is important to keep in mind the limitations of energy models when reviewing this information. Energy consumption is highly dependent on weather conditions, equipment operations & maintenance and the actual operating schedule of the building. The numbers generated will not necessarily be an accurate projection of actual energy costs but can serve as an accurate comparison between alternatives.

The software used for this analysis exceeds ASHRAE 90.1-2013 Section G.2.2.1 requirements of the referenced energy code states which mandates the following capabilities at a minimum:

1. 8760 hours per year
2. Hourly variations in occupancy and equipment schedules
3. Thermal mass effects
4. Ten or more thermal zones
5. Part-load performance curves for mechanical equipment
6. Capacity and efficiency correction curves for mechanical heating and cooling equipment
7. Airside economizers with integrated control
8. Baseline building design characteristics specified in Section G3

The following 2017 EIA State Average Utility Rates for electricity and natural gas have been used for estimating annual energy cost savings for the project:

Electricity	-	$0.1488 / kWh
Natural Gas	-	$0.985 / Therm

APPENDIX-A: MODEL INPUT SUMMARY

The envelope, internal load assumptions and HVAC system inputs in the energy model are based on the drawings and documents available to us and inputs from the design team.

Building Component	Base Case Code: ASHRAE 90.1-2013 + MA Amendments	Basis of Design: Hybrid Geothermal + ACHB
Building Type	Large Office	
Utility Rates	EIA State Average Electricity $0.15/kWh Gas $0.99/therm	
Roof Assembly	Continuous Insulation Above Deck R-30 U-0.032	Continuous Insulation Above Deck R-30 (typ) U-0.032
Wall Assembly	Steel Framed R13 cavity + R10 ci U-0.055	Multiple: Steel framed, metal panel, saw tooth panel, shadow box Aggregate Opaque U-Value: U-0.166 Component U-Values provided by Entuitive
Windows & Glazing	Fixed Metal Frame U - 0.42 SHGC - 0.40 VT - 0.44	Fixed Metal Frame, Triple Glazed Typical Performance: U - 0.254 SHGC - 0.25 VT - 0.58 Assembly U-Values provided by Entuitive
Window to Wall Ratio	40%	53%
HVAC System	WC Centrifugal Chiller, Gas Boiler, VAV	Hybrid Geothermal Heating/Cooling Plant
Cooling Efficiency	WC Chiller 0.595 kW/Ton 44F-54F CHWS reset	Geothermal Chiller 80-150T - 0.559 kW/Ton (6.29 COP) Supplemental Chillers 300T 0.527 kW/Ton (6.67 COP) 44F-54F CHWS reset
Heating Efficiency	82% Eff. Conventional Boiler	Geothermal Boiler 4.33 COP Supplemental Electric Boilers 100% Eff
Supply Air	Autosized per Code 182,000 CFM	AHU's 110,000 CFM (DOAS) Terminal Units Autosized to meet load
Ventilation Air	110,000 CFM	110,000 CFM
Fan Power	224 kW allowance per code	AHU's 320 HP, 214 kW, 30% DCV Min Flow Ratio Terminal Units 361 kW @ 0.4 w/cfm Total Building: 575 kW
Ventilation Energy Recovery	Yes, 50% total effectiveness	Dual Wheels, w/bypass 73.2% total effectiveness
Supply Air Reset	55F-60F depending on load	55F-60F depending on load
Demand Control Ventilation	Not Required in lieu of Energy Recovery	Not Required in lieu of Energy Recovery
Pump Power	213 kW Peak Demand	62 kW Peak Demand
Condenser Loop	Water cooled cooling tower with two speed fan	380Ton capacity ground heat exchanger Backup water cooled cooling tower
Lighting LPD	0.74 W/SF per C406.1-2	0.7 W/SF design target
Lighting Controls	Daylighting per code	Identical to baseline
Service Hot Water	Electric resistance storage heaters, 100% Eff Standard flow fixtures	Electric resistance storage heaters, 100% Eff Low flow fixtures
Process Loads	1.5 w/sf (all inclusive)	Identical to baseline

Attachment G

WIND IMPACT ASSESSMENT

BOSTON UNIVERSITY DATA SCIENCES CENTER

BOSTON, MA

PEDESTRIAN WIND STUDY
RWDI # 1400479
April 5, 2019

SUBMITTED TO

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EXECUTIVE SUMMARY

Rowan Williams Davies & Irwin Inc. (RWDI) prepared a Pedestrian Wind Study prior to conducting the wind tunnel study to assess the pedestrian wind conditions for the Project. The results and conclusions of the study found that appropriate wind conditions are expected at all entrances on Commonwealth Avenue, and at most areas on sidewalks. Accelerated wind speeds and potentially uncomfortable conditions are expected at the sidewalks close to the northwest and southwest corners of the building. Project features including stepped façades, recessed façades, and the presence of the building overhang do provide mitigation.

The study, which was based on wind tunnel testing of the proposed Project, including proposed and existing landscaping, showed that higher mean speeds, uncomfortable or comfortable for walking are expected close to the north, west and southwest building perimeters. Mean speeds further from the Project site are expected to remain similar to that in the No Build scenario. Wind speeds that meet the effective gust criterion are anticipated at all test locations in both the No Build and Build scenarios on an annual basis. During the winter months, wind speeds that do not meet the gust criterion are predicted off site to the southwest and west in both the No Build and Build scenarios, as they are not caused by the proposed development. No dangerous wind speeds are predicted annually or for any season for both the No Build and Build configurations.

The results of the wind tunnel study corroborate the results of the wind assessment as it was found that the BPDA criteria are anticipated to be met at most areas on and around the Project site. The wind tunnel study was conducted under the guidelines of the BPDA and met all aspects of the BPDA Scope for Wind. There are two exceptions to the statement that reads: “All buildings taller than 25 stories and within 2,400 feet of the project site should be placed at the appropriate location upstream of the project site during the test”.

- The first involves the Kenmore Square project, a future development that is not fully determined to-date, which is taller than 25 stories and would have been included in the wind tunnel study in a “Full Build” (i.e., future) scenario. However, Kenmore Square is the only future development within the study area and it was therefore deemed unnecessary to conduct an additional wind tunnel test configuration solely for the purposes of including this one future development. Kenmore Square is also located to the east-southeast of the Project site, which is not a main wind direction for Boston, and its impact on wind conditions on and around the Project site would be negligible.

- The second relates to the extent of the disc used to model the surrounding area around the Project. The physical maximum extent of the disc allows for modeling of all surrounding buildings within a 1,600-foot radius of the Project site, and as such, any developments beyond that extent would not fit in the wind tunnel.

- Furthermore, the results of the wind tunnel study show that the Project is not expected to significantly impact surrounding wind conditions outside a radius of roughly 500 feet, whereas Kenmore Square will lie roughly 1,300 ft to the east-southeast of the Project and the impacts of any developments further away would also be negligible.

As such, RWDI is confident that the results of the wind tunnel testing would be identical with or without the exclusion of the aforementioned buildings and that the data presented herein are accurate.

Results Summary

The predicted mean speed and effective gust conditions pertaining to the No Build and Build configurations are graphically depicted on site plans in Figures 1a through 2b. The wind conditions were assessed on an annual basis and seasonally. These conditions and the associated wind speeds are also numerically presented in Table 1 and the seasonal data are presented in Table 2. Unless specified otherwise, results referred to in this document are based on the annual assessment. The results presented can be summarized as follows:

Effective Gust

- Wind speeds that meet the effective gust criterion are anticipated at all test locations in both the No Build and Build scenarios on an annual basis. During the winter months, wind speeds that do not meet the gust criterion are predicted off site to the southwest and west in both the No Build and Build scenarios, as they are not caused by the proposed development.

Mean Speed

- Mean speeds in the No Build scenario are comfortable for sitting or standing close to the project site, and generally comfortable for walking further away from the site. Uncomfortable mean speeds occur off site to the west and southwest.
- With the addition of the proposed development and proposed landscaping in the Build scenario, higher mean speeds, uncomfortable or comfortable for walking, are predicted close to the north, west, and southwest building perimeters. Mean speeds further from the project site are expected to remain similar to that in the No Build scenario.
- No dangerous wind speeds are predicted annually or for any season for both No Build and Build configurations.

Wind Control

- If lower wind speeds are desired on site, in addition to the proposed landscaping modeled in the wind tunnel, satisfactory wind speeds can be achieved through the use of various hard and soft landscaping elements (i.e., windscreens, canopies, trellises, and landscaping such as tall planters).

Image 1: Site plan – Aerial View of Existing Site and Surroundings (Courtesy of Google™ Earth)

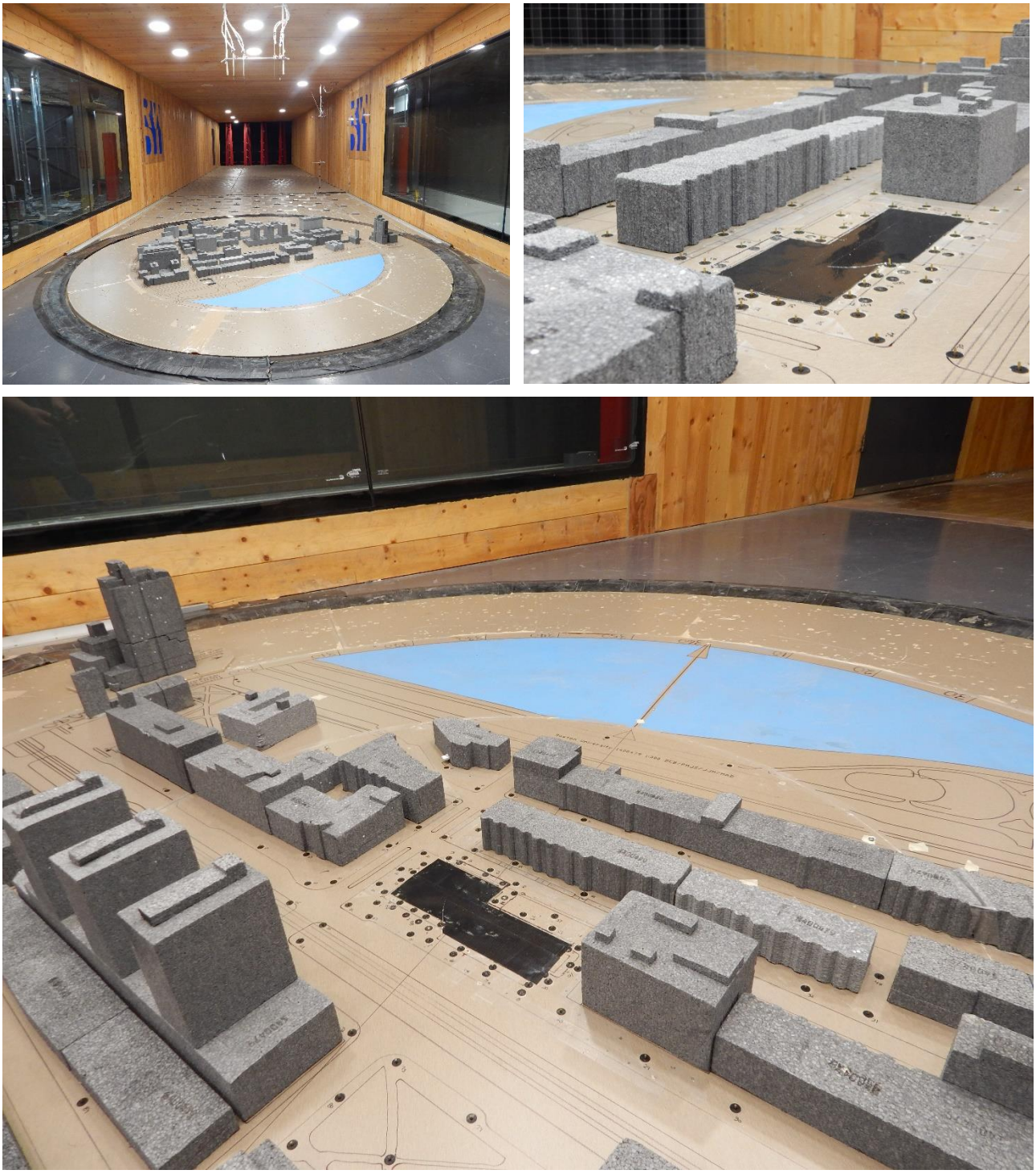


Image 2a: Wind Tunnel Study Model – No Build Configuration

Image 2b: Wind Tunnel Study Model – Build Configuration

Meteorological Data

Long-term meteorological data, recorded during the years 1995 through 2017 at Boston's Logan International Airport were used to predict full scale wind conditions. The analysis was performed separately for each of the four seasons and for the entire year. **Images 3 and 4** present "wind roses", summarizing the annual and seasonal wind climates in the Boston area, respectively, based on the data from Logan Airport.

The wind rose in **Image 3** summarizes wind data on an annual basis. The most common wind directions are those between north-northwest and south-southwest. Winds from the east-northeast to the east-southeast are also relatively common. In the case of strong winds, west-northwest, northwest and west are the dominant wind directions.

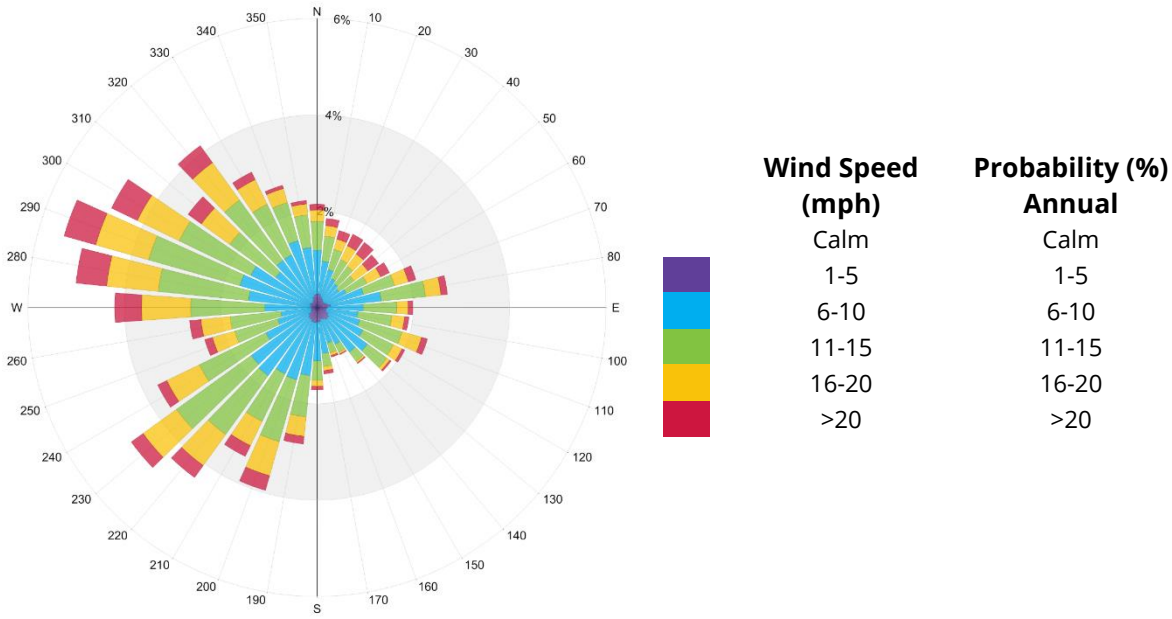
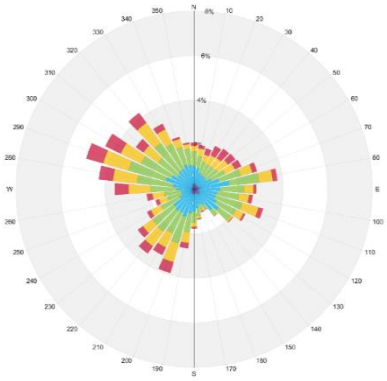
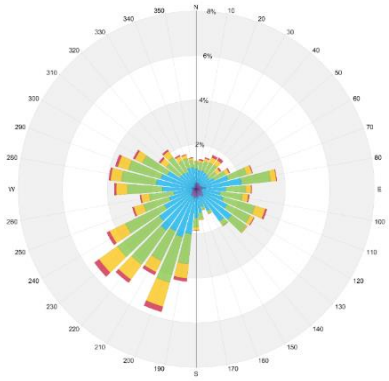


Image 3: Annual Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 through 2017

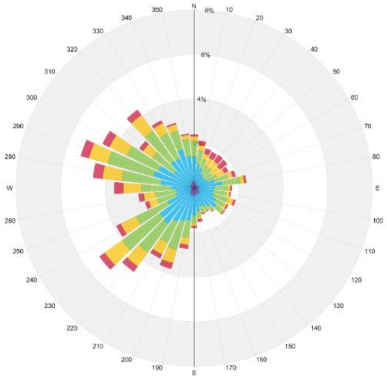
The first wind rose, for example, in **Image 4** summarizes the spring (March, April, and May) wind data which in general, indicate prevailing winds occurring from the northwest to south-southwest and northeast to east-southeast and strong winds (red bands), primarily occurring from the west-northwest, northwest, south-southwest and west directions.



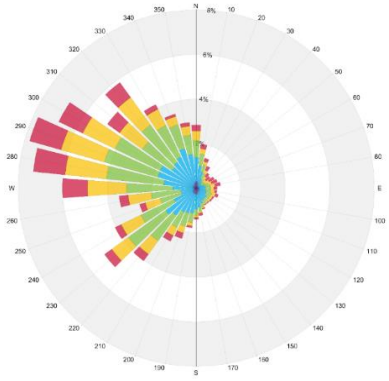
Spring (March to May)



Summer (June to August)



Fall (September to November)



Winter (December to February)

Wind Speed (mph)	Probability (%) Spring	Summer	Fall	Winter
Calm	2.8	3.1	3.4	2.6
1-5	6.8	9.5	8.7	6.5
6-10	28.9	38.7	34.5	27.9
11-15	32.5	34.4	32.0	30.8
16-20	19.1	11.8	14.6	19.7
>20	10.0	2.6	6.8	12.4

Image 4: Seasonal Directional Distribution of Winds Approaching Boston Logan International Airport from 1995 through 2017

Wind Criteria

The BPDA has adopted two standards for assessing the relative wind comfort of pedestrians. First, the BPDA 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 BPDA to determine the acceptability of specific locations is based on the work of Melbourne. 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:

BPDA Mean Wind Criteria*

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

* Applicable to the hourly mean wind speed exceeded 1% of the time.

The consideration of wind in planning outdoor activity areas is important since high winds in an area tend to deter pedestrian use. For example, winds should be light or relatively light in areas where people would be sitting, such as outdoor cafes or playgrounds. For bus stops and other locations where people would be standing, somewhat higher winds can be tolerated. For frequently used sidewalks, where people are primarily walking, stronger winds are acceptable. For infrequently used areas, the wind comfort criteria can be relaxed even further. The actual effects of wind can range from pedestrian inconvenience, due to the blowing of dust and other loose material in a moderate breeze, to severe difficulty with walking due to the wind forces on the pedestrian.

The wind climate found in a typical downtown location in Boston is generally comfortable for the pedestrian use of sidewalks and thoroughfares and meets the BPDA effective gust velocity criterion of 31 mph. However, without any mitigation measures, this wind climate is likely to be frequently uncomfortable for more passive activities such as sitting.

FIGURES

LEGEND:

MEAN SPEED CATEGORIES:
- Sitting
- Standing
- Walking
- Uncomfortable
- Dangerous

SENSOR LOCATION:
- Grade Level

STORROW DRIVE

BACK STREET

BAY STATE ROAD

GRANBY STREET

SILBER WAY

COMMONWEALTH AVENUE

ST. MARY'S STREET

BABBITT STREET

CENTER FOR PHOTONICS RESEARCH

CUMMINGTON STREET

WARREN TOWERS

HINSDALE STREET

BLANDFORD MALL

MASSACHUSETTS TURNPIKE

0 60 120ft

Pedestrian Wind Conditions - Mean Speed
No Build
Annual

Boston University Math and Data Sciences Building - Boston, MA

True North

Project #1400479

Drawn by: DBB	Figure: 1a	
Approx. Scale:	1"=120'	
Date Revised:	Feb. 4, 2019	

LEGEND:

MEAN SPEED CATEGORIES:
- Sitting
- Standing
- Walking
- Uncomfortable
- Dangerous

SENSOR LOCATION:
- Grade Level
- Main Entrance Location

Proposed Landscaping

STORROW DRIVE

BACK STREET

BAY STATE ROAD

GRANBY STREET

SILBER WAY

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

COMMONWEALTH AVENUE

ST. MARY'S STREET

BABBITT STREET

CENTER FOR PHOTONICS RESEARCH

CUMMINGTON STREET

WARREN TOWERS

HINSDALE STREET

BLANDFORD MALL

MASSACHUSETTS TURNPIKE

0 60 120ft

Pedestrian Wind Conditions - Mean Speed
Build
Annual

Boston University Math and Data Sciences Building - Boston, MA

True North

Project #1400479

Drawn by: DBB	Figure: 1b	
Approx. Scale:	1"=120'	
Date Revised:	Feb. 4, 2019	

LEGEND:

EFFECTIVE GUST SPEED CATEGORIES:
- Acceptable
- Unacceptable

SENSOR LOCATION:
- Grade Level

STORROW DRIVE

BACK STREET

BAY STATE ROAD

GRANBY STREET

SILBER WAY

COMMONWEALTH AVENUE

ST. MARY'S STREET

BABBITT STREET

CUMMINGTON STREET

WARREN TOWERS

CENTER FOR PHOTONICS RESEARCH

HINSDALE STREET

BLANDFORD MALL

MASSACHUSETTS TURNPIKE

0 60 120ft

Pedestrian Wind Conditions - Effective Gust
No Build
Annual

Boston University Math and Data Sciences Building - Boston, MA

True North

Project #1400479

Drawn by: DBB	Figure: 2a	
Approx. Scale: 1"=120'		
Date Revised: Feb. 4, 2019		

LEGEND:

EFFECTIVE GUST SPEED CATEGORIES:
- Acceptable
- Unacceptable

SENSOR LOCATION:
- Grade Level
- Main Entrance Location

Proposed Landscaping

STORROW DRIVE

BACK STREET

BAY STATE ROAD

GRANBY STREET

BUILDING ABOVE REMOVED FOR CLARITY OF GRADE LEVEL SENSORS

SILBER WAY

COMMONWEALTH AVENUE

ST. MARY'S STREET

BABBITT STREET

CENTER FOR PHOTONICS RESEARCH

CUMMINGTON STREET

WARREN TOWERS

HINSDALE STREET

BLANDFORD MALL

MASSACHUSETTS TURNPIKE

0 60 120ft

Pedestrian Wind Conditions - Mean Speed

Build

Annual

Boston University Math and Data Sciences Building - Boston, MA

True North

Project #1400479

Drawn by: DBB	Figure: 2b	
Approx. Scale:	1"=120'	
Date Revised:	Feb. 4, 2019	

TABLES

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
1	A	Annual	13		Standing	20		Acceptable
	B	Annual	22	69%	Uncomfortable	28	40%	Acceptable
2	A	Annual	11		Sitting	17		Acceptable
	B	Annual	10		Sitting	15	-12%	Acceptable
3	A	Annual	13		Standing	20		Acceptable
	B	Annual	14		Standing	20		Acceptable
4	A	Annual	10		Sitting	17		Acceptable
	B	Annual	8	-20%	Sitting	12	-29%	Acceptable
5	A	Annual	11		Sitting	17		Acceptable
	B	Annual	12		Sitting	17		Acceptable
6	A	Annual	12		Sitting	18		Acceptable
	B	Annual	10	-17%	Sitting	15	-17%	Acceptable
7	A	Annual	11		Sitting	17		Acceptable
	B	Annual	10		Sitting	16		Acceptable
8	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	17		Acceptable
9	A	Annual	13		Standing	20		Acceptable
	B	Annual	9	-31%	Sitting	16	-20%	Acceptable
10	A	Annual	12		Sitting	19		Acceptable
	B	Annual	16	33%	Walking	22	16%	Acceptable
11	A	Annual	10		Sitting	17		Acceptable
	B	Annual	17	70%	Walking	24	41%	Acceptable
12	A	Annual	10		Sitting	17		Acceptable
	B	Annual	11		Sitting	16		Acceptable
13	A	Annual	10		Sitting	17		Acceptable
	B	Annual	12	20%	Sitting	18		Acceptable
14	A	Annual	10		Sitting	17		Acceptable
	B	Annual	9		Sitting	13	-24%	Acceptable
15	A	Annual	11		Sitting	18		Acceptable
	B	Annual	16	45%	Walking	24	33%	Acceptable
16	A	Annual	12		Sitting	17		Acceptable
	B	Annual	20	67%	Uncomfortable	27	59%	Acceptable
17	A	Annual	10		Sitting	16		Acceptable
	B	Annual	16	60%	Walking	22	38%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
18	A	Annual	14		Standing	20		Acceptable
	B	Annual	18	29%	Walking	24	20%	Acceptable
19	A	Annual	11		Sitting	17		Acceptable
	B	Annual	19	73%	Walking	25	47%	Acceptable
20	A	Annual	9		Sitting	14		Acceptable
	B	Annual	23	156%	Uncomfortable	28	100%	Acceptable
21	A	Annual	9		Sitting	15		Acceptable
	B	Annual	16	78%	Walking	25	67%	Acceptable
22	A	Annual	8		Sitting	14		Acceptable
	B	Annual	14	75%	Standing	21	50%	Acceptable
23	A	Annual	9		Sitting	14		Acceptable
	B	Annual	16	78%	Walking	22	57%	Acceptable
24	A	Annual	11		Sitting	17		Acceptable
	B	Annual	14	27%	Standing	20	18%	Acceptable
25	A	Annual	12		Sitting	18		Acceptable
	B	Annual	19	58%	Walking	25	39%	Acceptable
26	A	Annual	16		Walking	23		Acceptable
	B	Annual	17		Walking	23		Acceptable
27	A	Annual	15		Standing	22		Acceptable
	B	Annual	20	33%	Uncomfortable	27	23%	Acceptable
28	A	Annual	17		Walking	23		Acceptable
	B	Annual	10	-41%	Sitting	16	-30%	Acceptable
29	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	16	-11%	Acceptable
30	A	Annual	13		Standing	20		Acceptable
	B	Annual	12		Sitting	18		Acceptable
31	A	Annual	11		Sitting	17		Acceptable
	B	Annual	11		Sitting	17		Acceptable
32	A	Annual	11		Sitting	17		Acceptable
	B	Annual	10		Sitting	16		Acceptable
33	A	Annual	13		Standing	20		Acceptable
	B	Annual	12		Sitting	18		Acceptable
34	A	Annual	15		Standing	21		Acceptable
	B	Annual	9	-40%	Sitting	14	-33%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
35	A	Annual	9		Sitting	15		Acceptable
	B	Annual	6	-33%	Sitting	10	-33%	Acceptable
36	A	Annual	13		Standing	21		Acceptable
	B	Annual	10	-23%	Sitting	16	-24%	Acceptable
37	A	Annual	12		Sitting	18		Acceptable
	B	Annual	15	25%	Standing	21	17%	Acceptable
38	A	Annual	8		Sitting	14		Acceptable
	B	Annual	12	50%	Sitting	18	29%	Acceptable
39	A	Annual	7		Sitting	11		Acceptable
	B	Annual	15	114%	Standing	19	73%	Acceptable
40	A	Annual	17		Walking	24		Acceptable
	B	Annual	18		Walking	25		Acceptable
41	A	Annual	8		Sitting	14		Acceptable
	B	Annual	14	75%	Standing	21	50%	Acceptable
42	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	17		Acceptable
43	A	Annual	17		Walking	24		Acceptable
	B	Annual	13	-24%	Standing	19	-21%	Acceptable
44	A	Annual	15		Standing	22		Acceptable
	B	Annual	17	13%	Walking	24		Acceptable
45	A	Annual	12		Sitting	18		Acceptable
	B	Annual	11		Sitting	17		Acceptable
46	A	Annual	11		Sitting	17		Acceptable
	B	Annual	11		Sitting	17		Acceptable
47	A	Annual	10		Sitting	16		Acceptable
	B	Annual	9		Sitting	15		Acceptable
48	A	Annual	8		Sitting	13		Acceptable
	B	Annual	8		Sitting	13		Acceptable
49	A	Annual	11		Sitting	16		Acceptable
	B	Annual	11		Sitting	15		Acceptable
50	A	Annual	10		Sitting	16		Acceptable
	B	Annual	10		Sitting	16		Acceptable
51	A	Annual	9		Sitting	15		Acceptable
	B	Annual	11	22%	Sitting	18	20%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
52	A	Annual	14		Standing	23		Acceptable
	B	Annual	14		Standing	21		Acceptable
53	A	Annual	19		Walking	26		Acceptable
	B	Annual	16	-16%	Walking	23	-12%	Acceptable
54	A	Annual	14		Standing	21		Acceptable
	B	Annual	13		Standing	20		Acceptable
55	A	Annual	17		Walking	25		Acceptable
	B	Annual	15	-12%	Standing	23		Acceptable
56	A	Annual	15		Standing	24		Acceptable
	B	Annual	14		Standing	21	-12%	Acceptable
57	A	Annual	17		Walking	24		Acceptable
	B	Annual	15	-12%	Standing	21	-12%	Acceptable
58	A	Annual	16		Walking	22		Acceptable
	B	Annual	11	-31%	Sitting	17	-23%	Acceptable
59	A	Annual	8		Sitting	14		Acceptable
	B	Annual	13	62%	Standing	19	36%	Acceptable
60	A	Annual	8		Sitting	13		Acceptable
	B	Annual	18	125%	Walking	24	85%	Acceptable
61	A	Annual	16		Walking	23		Acceptable
	B	Annual	15		Standing	23		Acceptable
62	A	Annual	17		Walking	25		Acceptable
	B	Annual	14	-18%	Standing	22	-12%	Acceptable
63	A	Annual	13		Standing	21		Acceptable
	B	Annual	10	-23%	Sitting	18	-14%	Acceptable
64	A	Annual	17		Walking	25		Acceptable
	B	Annual	15	-12%	Standing	22	-12%	Acceptable
65	A	Annual	17		Walking	25		Acceptable
	B	Annual	15	-12%	Standing	23		Acceptable
66	A	Annual	18		Walking	26		Acceptable
	B	Annual	17		Walking	25		Acceptable
67	A	Annual	14		Standing	22		Acceptable
	B	Annual	14		Standing	21		Acceptable
68	A	Annual	14		Standing	20		Acceptable
	B	Annual	16	14%	Walking	23	15%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
69	A	Annual	16		Walking	24		Acceptable
	B	Annual	18	12%	Walking	26		Acceptable
70	A	Annual	16		Walking	24		Acceptable
	B	Annual	18	12%	Walking	24		Acceptable
71	A	Annual	13		Standing	19		Acceptable
	B	Annual	16	23%	Walking	23	21%	Acceptable
72	A	Annual	17		Walking	24		Acceptable
	B	Annual	17		Walking	24		Acceptable
73	A	Annual	17		Walking	25		Acceptable
	B	Annual	17		Walking	24		Acceptable
74	A	Annual	14		Standing	21		Acceptable
	B	Annual	14		Standing	22		Acceptable
75	A	Annual	14		Standing	21		Acceptable
	B	Annual	16	14%	Walking	23		Acceptable
76	A	Annual	19		Walking	27		Acceptable
	B	Annual	19		Walking	27		Acceptable
77	A	Annual	9		Sitting	15		Acceptable
	B	Annual	8	-11%	Sitting	14		Acceptable
78	A	Annual	12		Sitting	19		Acceptable
	B	Annual	13		Standing	21	11%	Acceptable
79	A	Annual	11		Sitting	19		Acceptable
	B	Annual	13	18%	Standing	20		Acceptable
80	A	Annual	18		Walking	27		Acceptable
	B	Annual	17		Walking	25		Acceptable
81	A	Annual	7		Sitting	12		Acceptable
	B	Annual	7		Sitting	12		Acceptable
82	A	Annual	19		Walking	25		Acceptable
	B	Annual	18		Walking	25		Acceptable
83	A	Annual	18		Walking	25		Acceptable
	B	Annual	18		Walking	24		Acceptable
84	A	Annual	11		Sitting	17		Acceptable
	B	Annual	12		Sitting	18		Acceptable
85	A	Annual	17		Walking	23		Acceptable
	B	Annual	17		Walking	23		Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
86	A	Annual	9		Sitting	14		Acceptable
	B	Annual	15	67%	Standing	21	50%	Acceptable
87	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	16	-11%	Acceptable
88	A	Annual	12		Sitting	17		Acceptable
	B	Annual	10	-17%	Sitting	14	-18%	Acceptable
89	A	Annual	16		Walking	22		Acceptable
	B	Annual	12	-25%	Sitting	19	-14%	Acceptable
90	A	Annual	20		Uncomfortable	28		Acceptable
	B	Annual	18		Walking	26		Acceptable
91	A	Annual	18		Walking	24		Acceptable
	B	Annual	17		Walking	23		Acceptable
92	A	Annual	17		Walking	22		Acceptable
	B	Annual	17		Walking	23		Acceptable
93	A	Annual	15		Standing	24		Acceptable
	B	Annual	15		Standing	23		Acceptable
94	A	Annual	22		Uncomfortable	30		Acceptable
	B	Annual	22		Uncomfortable	30		Acceptable
95	A	Annual	17		Walking	25		Acceptable
	B	Annual	17		Walking	25		Acceptable
96	A	Annual	16		Walking	24		Acceptable
	B	Annual	16		Walking	24		Acceptable
97	A	Annual	13		Standing	22		Acceptable
	B	Annual	13		Standing	22		Acceptable
98	A	Annual	21		Uncomfortable	29		Acceptable
	B	Annual	21		Uncomfortable	28		Acceptable
99	A	Annual	15		Standing	23		Acceptable
	B	Annual	15		Standing	23		Acceptable
100	A	Annual	14		Standing	20		Acceptable
	B	Annual	14		Standing	20		Acceptable
101	A	Annual	14		Standing	21		Acceptable
	B	Annual	14		Standing	21		Acceptable
102	A	Annual	18		Walking	25		Acceptable
	B	Annual	15	-17%	Standing	22	-12%	Acceptable

Table 1: Mean Speed and Effective Gust Categories - Annual

Location	Configuration	Season	Mean Wind Speed			Effective Gust Wind Speed		
			Speed (mph)	% Change	Rating	Speed (mph)	% Change	Rating
103	A	Annual	17		Walking	25		Acceptable
	B	Annual	15	-12%	Standing	23		Acceptable
104	A	Annual	15		Standing	24		Acceptable
	B	Annual	15		Standing	23		Acceptable
105	A	Annual	11		Sitting	18		Acceptable
	B	Annual	11		Sitting	18		Acceptable
106	A	Annual	19		Walking	27		Acceptable
	B	Annual	19		Walking	27		Acceptable
107	A	Annual	16		Walking	24		Acceptable
	B	Annual	16		Walking	24		Acceptable
108	A	Annual	16		Walking	22		Acceptable
	B	Annual	15		Standing	21		Acceptable
109	A	Annual	13		Standing	19		Acceptable
	B	Annual	13		Standing	19		Acceptable
110	A	Annual	12		Sitting	18		Acceptable
	B	Annual	15	25%	Standing	20	11%	Acceptable
111	A	Annual	13		Standing	20		Acceptable
	B	Annual	14		Standing	21		Acceptable
112	A	Annual	15		Standing	21		Acceptable
	B	Annual	15		Standing	21		Acceptable

Configurations	Mean Wind Criteria Speed (mph)		Effective Gust Criteria (mph)	
No Build	≤ 12	Comfortable for Sitting	≤ 31	Acceptable
Without the proposed development.	13 - 15	Comfortable for Standing	> 31	Unacceptable
Build	16 - 19	Comfortable for Walking		
With the proposed development and landscaping.	20 - 27	Uncomfortable for Walking		
	> 27	Dangerous Conditions		

Notes

1) Wind Speeds are for a 1% probability of exceedance

2) % Change is based on comparison with Configuration A

3) % changes less than 10% are excluded

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
1	A	14	11	13	15	21	17	20	22
	B	23	17	20	24	29	22	27	31
2	A	11	8	10	12	17	13	16	18
	B	11	9	10	11	16	13	15	16
3	A	14	10	13	15	20	16	19	22
	B	14	10	13	15	21	15	19	22
4	A	11	8	10	11	17	13	16	18
	B	9	7	8	9	13	10	12	13
5	A	12	9	11	13	18	14	17	19
	B	13	9	12	12	18	13	17	18
6	A	13	9	12	14	19	14	17	20
	B	10	8	10	10	15	12	14	15
7	A	11	8	10	12	17	13	16	18
	B	10	8	9	10	16	12	15	17
8	A	12	10	11	12	18	15	17	19
	B	11	9	11	12	18	14	17	19
9	A	14	11	12	13	21	17	19	21
	B	10	9	9	10	17	15	16	16
10	A	12	10	11	12	20	16	18	21
	B	17	13	16	16	24	18	22	23
11	A	11	9	10	10	18	15	16	18
	B	19	13	18	17	26	19	25	25
12	A	11	8	10	10	19	14	17	17
	B	12	8	11	11	18	13	17	17
13	A	11	8	10	10	18	14	17	17
	B	12	9	11	13	18	14	17	19
14	A	11	9	10	11	18	14	16	17
	B	10	7	9	10	14	10	13	14
15	A	13	9	12	11	19	15	18	18
	B	17	13	16	17	24	18	23	25
16	A	13	9	12	12	19	15	18	18
	B	21	15	19	22	28	21	25	29
17	A	10	8	10	10	17	14	16	17
	B	16	12	15	18	22	17	20	24

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
18	A	14	11	13	15	21	16	19	22
	B	18	14	17	19	24	19	23	26
19	A	11	8	10	11	18	14	17	19
	B	20	14	18	20	26	20	25	27
20	A	9	7	8	9	15	12	14	15
	B	25	18	23	24	31	22	29	30
21	A	9	8	9	10	16	13	15	16
	B	17	13	16	18	25	19	24	27
22	A	9	7	9	9	15	12	14	15
	B	15	11	15	16	22	16	21	23
23	A	9	7	9	9	15	12	15	15
	B	16	12	15	17	22	17	20	24
24	A	11	8	10	11	18	14	17	19
	B	15	12	14	15	21	17	20	21
25	A	12	9	11	12	19	15	18	20
	B	19	15	18	20	26	20	24	27
26	A	16	13	15	17	23	19	22	25
	B	17	13	16	18	23	18	22	25
27	A	15	12	14	16	22	18	21	24
	B	21	16	19	22	27	21	25	29
28	A	17	13	16	19	24	19	22	26
	B	11	8	10	11	17	13	16	18
29	A	12	10	11	12	19	15	17	19
	B	12	9	11	11	17	13	16	17
30	A	14	12	13	14	21	18	20	21
	B	13	10	12	13	19	16	18	19
31	A	12	8	11	11	18	13	17	17
	B	12	9	11	11	19	14	17	18
32	A	11	8	10	12	17	13	16	18
	B	10	8	10	11	16	12	15	17
33	A	14	10	13	14	21	15	19	21
	B	13	9	12	13	19	14	17	19
34	A	15	12	14	16	22	18	20	23
	B	9	8	9	9	15	13	14	15

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
35	A	10	7	9	10	16	12	15	17
	B	7	5	6	7	11	8	10	11
36	A	15	11	13	14	22	16	20	22
	B	11	9	10	11	17	13	16	17
37	A	13	9	12	12	20	15	19	18
	B	17	12	16	16	23	17	21	22
38	A	9	7	8	9	14	12	13	15
	B	13	10	12	13	19	15	18	19
39	A	7	6	7	7	12	10	11	12
	B	15	11	14	16	20	15	19	21
40	A	18	14	16	19	24	19	23	26
	B	20	15	19	19	27	19	25	26
41	A	9	7	8	9	15	11	14	15
	B	15	11	14	15	21	16	20	22
42	A	12	9	11	13	18	14	17	20
	B	11	9	11	12	17	13	17	19
43	A	17	13	16	18	25	18	23	26
	B	14	11	13	14	20	15	19	21
44	A	16	12	15	17	22	17	21	23
	B	17	14	17	19	24	19	23	26
45	A	12	9	11	13	19	14	18	19
	B	11	9	11	12	18	14	17	19
46	A	12	9	11	12	18	13	16	18
	B	12	9	11	12	17	13	16	18
47	A	10	8	10	10	17	13	16	17
	B	10	7	9	10	17	12	15	16
48	A	9	6	8	9	14	10	13	14
	B	9	7	8	9	14	11	13	14
49	A	11	8	10	12	16	13	15	17
	B	11	8	10	12	16	12	15	17
50	A	11	8	10	11	17	13	15	18
	B	11	8	10	11	17	13	16	18
51	A	9	7	9	10	15	13	15	17
	B	11	9	11	12	18	15	17	19

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
52	A	16	11	14	15	24	18	22	24
	B	15	11	13	14	23	17	20	23
53	A	20	15	18	21	27	20	25	29
	B	17	13	15	18	24	19	22	25
54	A	15	11	13	16	22	16	20	23
	B	14	11	13	15	21	16	19	22
55	A	18	13	16	19	25	20	24	27
	B	15	12	14	16	23	19	21	25
56	A	16	13	15	16	25	20	23	26
	B	15	13	14	15	22	18	21	22
57	A	17	13	16	18	25	19	22	26
	B	15	12	14	16	22	17	20	23
58	A	16	12	16	18	23	17	22	24
	B	12	10	11	13	17	14	17	18
59	A	8	7	8	9	14	11	13	15
	B	13	10	13	14	19	15	19	20
60	A	8	7	8	9	13	11	13	14
	B	20	14	19	19	26	19	25	25
61	A	16	13	15	17	24	20	22	25
	B	17	12	16	16	25	18	23	23
62	A	17	14	16	19	25	21	24	26
	B	14	12	14	15	23	19	22	23
63	A	14	11	13	14	21	19	20	22
	B	11	10	11	11	19	17	18	19
64	A	18	14	16	18	26	21	24	26
	B	15	12	14	16	23	20	22	24
65	A	18	14	17	19	26	21	25	27
	B	16	12	15	17	23	19	22	24
66	A	18	14	17	19	27	21	25	27
	B	17	13	17	18	26	19	25	27
67	A	15	12	14	15	23	17	21	23
	B	14	11	13	15	23	17	21	23
68	A	14	11	13	15	21	16	19	22
	B	17	12	15	17	24	18	22	24

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
69	A	17	13	16	18	25	19	23	26
	B	19	14	18	20	27	20	25	28
70	A	17	13	16	18	24	20	23	26
	B	18	14	17	20	25	19	24	26
71	A	13	10	12	14	20	15	18	21
	B	17	12	15	18	25	18	23	25
72	A	17	13	16	19	25	19	23	27
	B	17	13	16	18	24	18	22	26
73	A	18	14	16	19	26	20	24	27
	B	18	13	16	19	25	19	23	26
74	A	14	11	13	15	22	17	20	23
	B	15	11	14	15	24	18	22	24
75	A	15	11	14	14	23	18	22	22
	B	17	13	16	16	26	19	24	24
76	A	19	17	19	21	27	23	26	29
	B	19	17	19	21	27	23	27	28
77	A	10	7	9	9	16	12	15	16
	B	9	7	8	8	16	11	14	14
78	A	13	9	12	12	21	15	20	19
	B	15	10	14	13	23	17	22	21
79	A	12	10	11	12	19	16	18	20
	B	14	11	13	13	21	17	20	21
80	A	19	17	18	20	27	24	26	28
	B	17	16	17	18	25	23	24	26
81	A	7	6	7	7	12	10	12	12
	B	7	6	7	7	12	10	11	12
82	A	19	17	19	20	26	23	25	27
	B	19	17	18	20	25	22	24	26
83	A	18	16	18	19	26	22	25	27
	B	18	16	18	19	25	22	24	26
84	A	11	8	10	12	18	14	16	18
	B	13	9	12	13	19	14	18	20
85	A	17	14	16	19	24	19	22	25
	B	18	14	17	19	24	19	22	25

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
86	A	9	7	9	9	15	12	14	15
	B	16	12	14	17	22	17	20	24
87	A	12	9	11	12	18	14	17	19
	B	12	10	12	12	17	14	17	17
88	A	12	9	11	13	18	14	17	19
	B	11	8	10	11	15	11	14	15
89	A	16	12	15	17	23	18	21	24
	B	13	10	12	13	20	15	19	21
90	A	21	15	20	20	31	22	29	29
	B	20	14	18	18	29	21	27	27
91	A	20	14	18	18	26	19	24	25
	B	19	15	17	18	25	19	23	24
92	A	17	13	16	19	23	17	21	25
	B	17	13	16	19	23	18	21	25
93	A	16	13	15	17	24	21	23	25
	B	15	13	14	16	24	20	22	25
94	A	23	19	21	24	31	25	29	33
	B	22	18	21	24	31	25	29	32
95	A	17	14	16	18	25	21	24	27
	B	17	14	16	18	25	20	23	26
96	A	17	14	16	17	25	22	24	25
	B	17	14	15	17	25	22	24	25
97	A	13	10	13	15	22	17	21	24
	B	13	10	13	15	22	17	21	24
98	A	21	16	20	24	30	22	27	32
	B	21	15	19	23	29	22	26	32
99	A	16	12	15	17	24	18	22	25
	B	16	12	14	16	24	18	22	25
100	A	14	12	14	15	21	16	19	21
	B	15	12	14	15	21	16	20	21
101	A	14	12	13	15	22	18	20	23
	B	14	12	13	14	22	18	20	22
102	A	18	14	17	19	26	20	24	27
	B	15	11	14	16	23	17	22	24

Table 2: Mean Speed and Effective Gust Categories - Seasonal

Location	Configuration	Mean Wind Speed (mph)				Effective Gust Wind Speed (mph)			
		Spring	Summer	Fall	Winter	Spring	Summer	Fall	Winter
103	A	18	14	17	19	26	20	24	27
	B	16	12	15	16	24	19	22	24
104	A	16	12	15	17	25	18	23	26
	B	15	11	14	16	24	18	22	26
105	A	12	9	11	12	19	14	18	20
	B	11	8	10	12	19	14	17	20
106	A	20	16	18	21	28	22	25	29
	B	20	15	18	21	28	21	25	29
107	A	17	13	15	18	25	18	22	26
	B	16	12	15	17	25	18	22	26
108	A	18	12	16	16	24	17	22	23
	B	17	12	16	16	23	17	21	23
109	A	14	10	13	14	20	15	18	21
	B	13	10	12	14	20	15	18	21
110	A	13	10	12	13	19	14	18	19
	B	16	12	15	16	21	16	20	21
111	A	15	10	14	13	22	16	20	20
	B	16	11	15	14	23	16	22	22
112	A	15	12	14	16	22	16	20	23
	B	15	11	14	16	22	16	20	23

Seasons	Months
Spring	March - May
Summer	June - August
Fall	September - November
Winter	December - February
Annual	January - December

Mean Wind Criteria Speed (mph)	
≤ 12	Comfortable for Sitting
13 - 15	Comfortable for Standing
16 - 19	Comfortable for Walking
20 - 27	Uncomfortable for Walking
> 27	Dangerous Conditions

Effective Gust Criteria (mph)	
≤ 31	Acceptable
> 31	Unacceptable

Configurations

No Build	Without the proposed development.
Build	With the proposed development and landscaping.

Notes

1) Wind Speeds are for a 1% probability of exceedance

Attachment H

NOISE IMPACT ASSESSMENT

ACENTECH

33 Moulton Street
Cambridge MA 02138
617 499 8000
acentech.com

COMMUNITY NOISE STUDY

Boston University – Data Sciences Center

Acentech Project # 630354 – March 22, 2019

As required by the Boston Planning and Development Agency in their "Scoping Determination for the Proposed Amendment to the Boston University Institutional Master Plan and Proposed Data Sciences Center", dated 12.14.2018, Acentech performed a site noise survey between Friday 2.22.2019 and 22.27.2019, to quantify current ambient noise levels in the project area, during both daytime and nighttime hours.

Following is a summary of these measurements, observations and conclusion.

MEASUREMENTS

Sound levels meters (SLM) were installed at four locations on and around the project's site, as shown in Exhibit 1. The data was measured continuously and averaged in five-minute intervals, and it is presented in Exhibits 2 through 5. In accordance with local industry standards, the measured "L90" sound levels are reported, as the natural ambient sound level, in terms of A-weighted decibels. The "L90" value is that which is exceeded 90% of the time during the measurement period. "A-weighted decibels" are a weighted sum of sound levels across the audible frequency spectrum, with weightings based on the sensitivity of human hearing. One can think of it as a kind of "overall" noise level.

There were a few sound events that took place during the measured period, which are not typical for the site. First, an emergency generator operated on the site throughout the weekend; this is most evident in the 645 Commonwealth Avenue measurements (Exhibit 1). Second, strong winds on Sunday and Monday may have affected the documented sound levels. Because of these anomalies, we consider that the noise levels captured on Monday and Tuesday night were typical overall; therefore, the quietest noise levels measured during those nights were utilized to establish the baseline.

The measured locations and corresponding quietest sound levels are summarized in the table below:

Location ID	Measurement Location	Quietest Measured Level
1	645 Commonwealth Ave, Parking Lot (see Photo 1)	52 dBA
2	635 Commonwealth Avenue, Building Roof (see Photo 2)	57 dBA
3	198 Bay State Road, Building Roof (see Photo 3)	49 dBA
4	Granby Street Park (see Photo 4)	50 dBA

Photo 1: SLM at Location 1

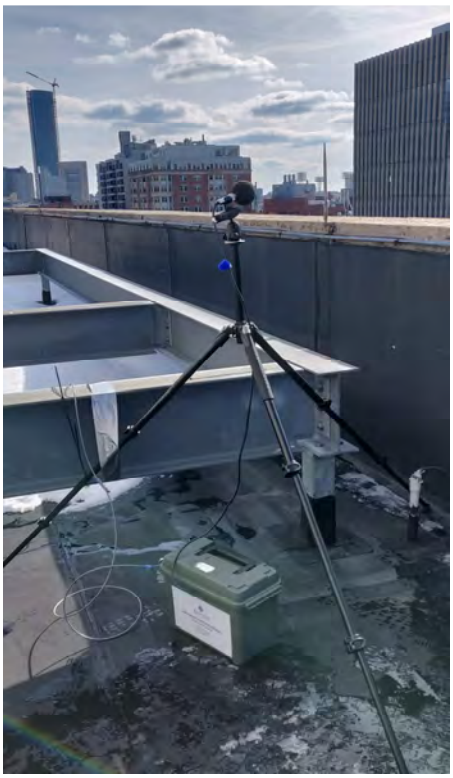


Photo 2: SLM at Location 2

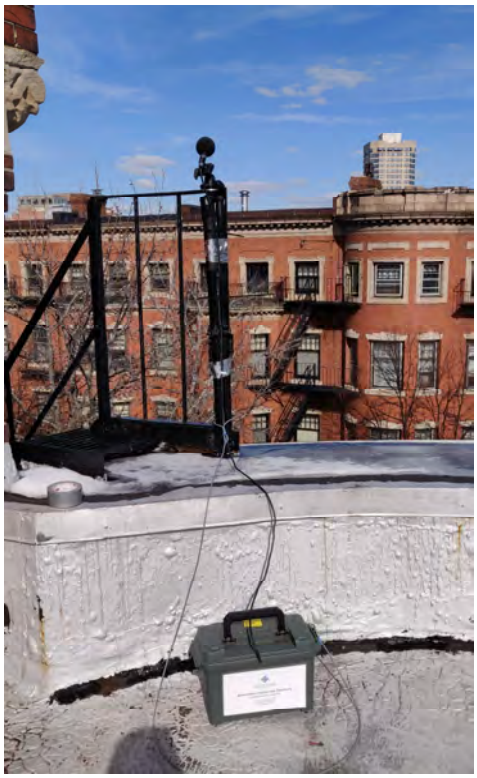


Photo 3: SLM at Location3

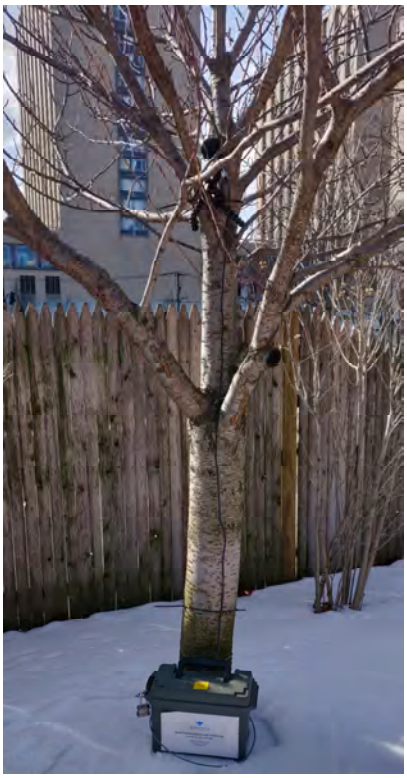


Photo 4: SLM at Location 4

BOSTON NOISE ORDINANCE

The maximum allowable noise levels at a lot line, according to the City of Boston Noise Ordinance, is 60 dBA during daytime[1], and 50 dBA at night[2].

The quietest nighttime level requirement of 50 dBA appears to be in agreement with the quietest noise levels measured at the site, of about 50 dBA

PROJECT IMPACT

The main mechanical equipment will be located inside the building, in the basement and mechanical penthouse. Ventilation to the equipment will be provided through large louvers at the exterior of the building. Sound attenuation measures, including duct sound attenuators and acoustical louvers will be employed, to minimize the noise impacts on the community and to comply with the local regulation and not exceed existing noise levels at the site.

Encl: Exhibits 1 through 5

[1] Defined as 7:00 AM to 6:00 PM, daily, except Sunday
[2] All other times.

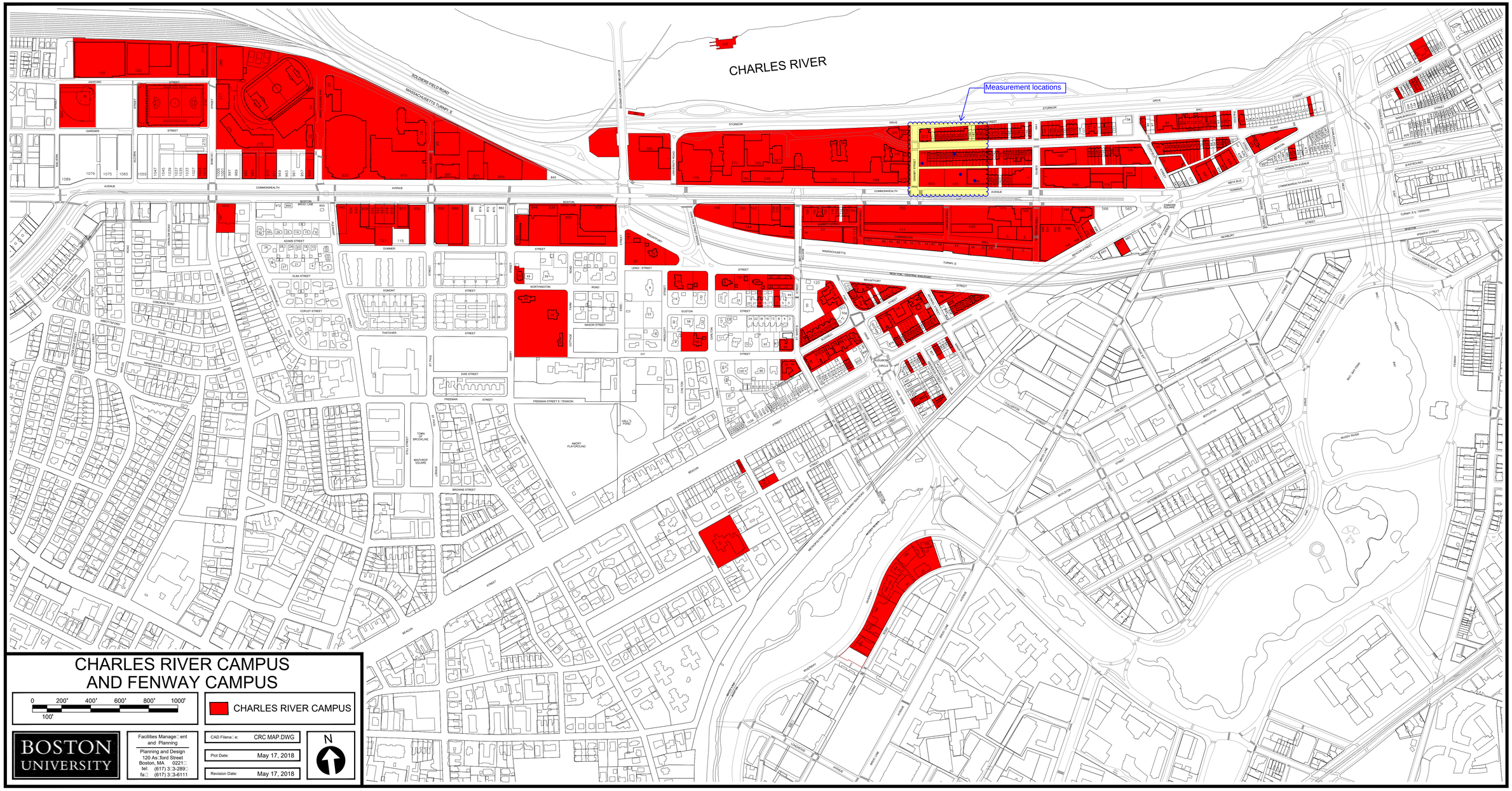


Exhibit 1: Measurement Locations

Exhibit 2

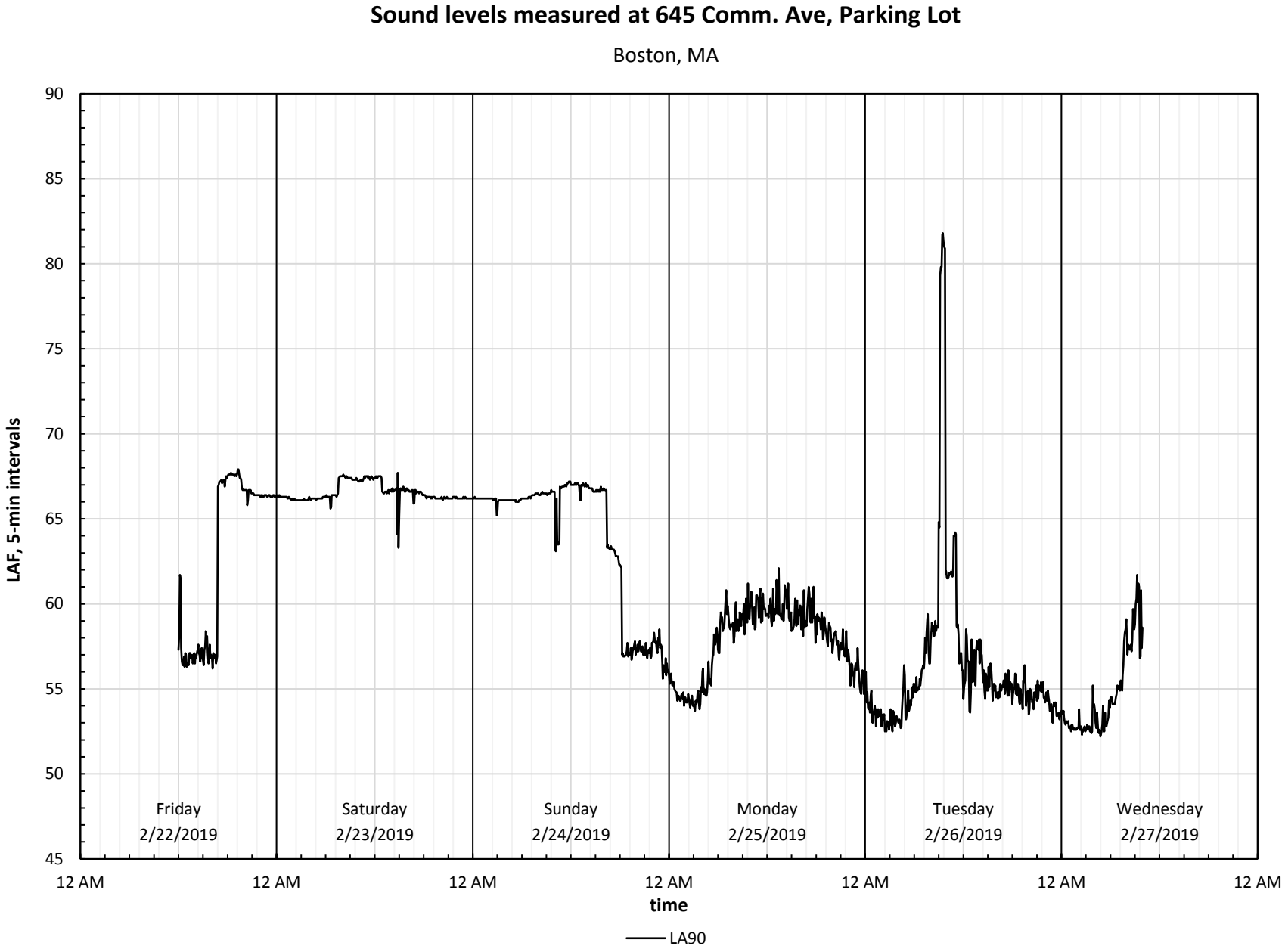

Sound levels measured at 645 Comm. Ave, Parking Lot
Boston, MA
LAF, 5-min intervals
90
85
80
75
70
65
60
55
50
45
Friday
2/22/2019
Saturday
2/23/2019
Sunday
2/24/2019
Monday
2/25/2019
Tuesday
2/26/2019
Wednesday
2/27/2019
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
time
LA90

Exhibit 3

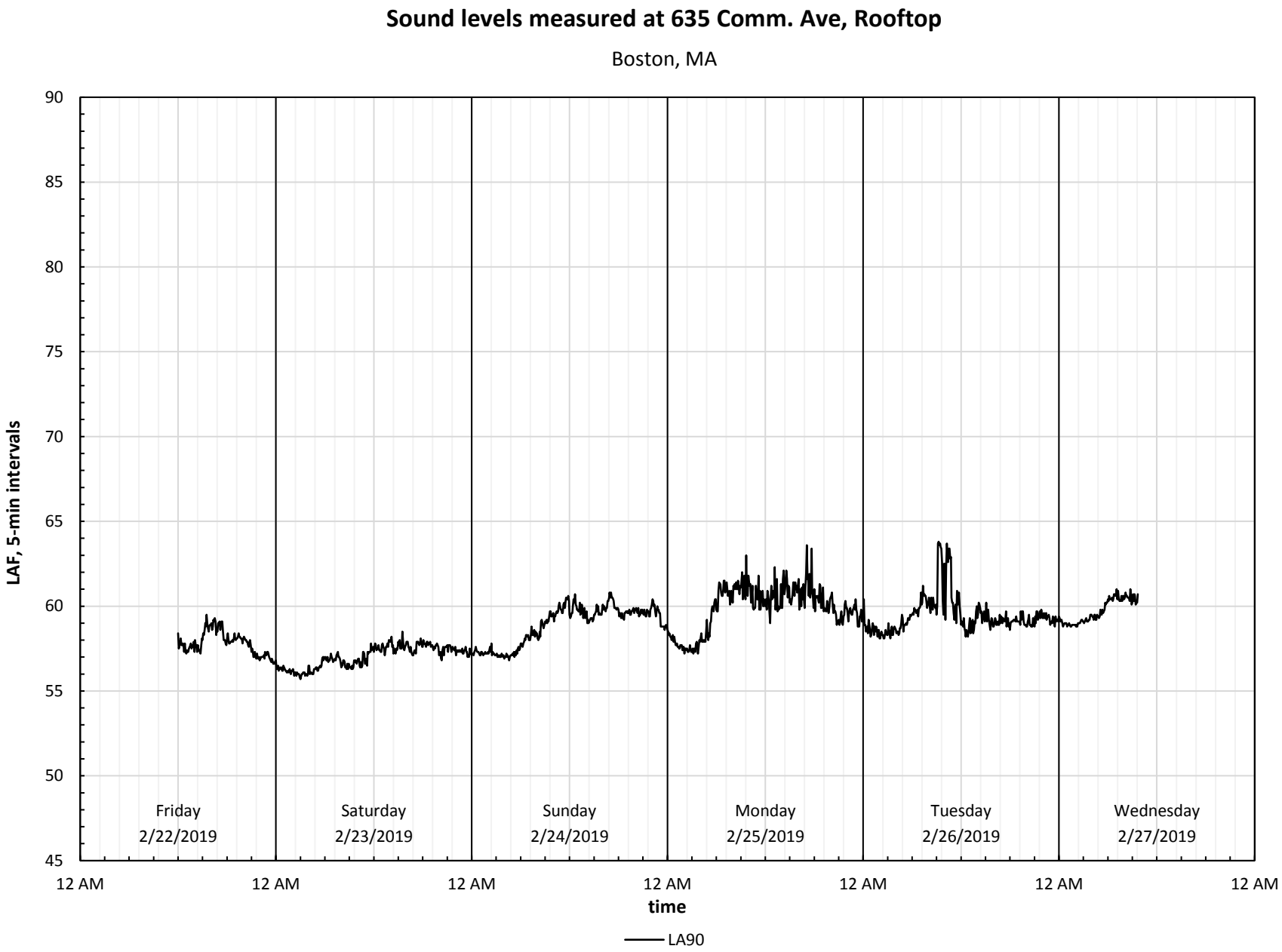

Sound levels measured at 635 Comm. Ave, Rooftop
Boston, MA
LAF, 5-min intervals
90
85
80
75
70
65
60
55
50
45
Friday
2/22/2019
Saturday
2/23/2019
Sunday
2/24/2019
Monday
2/25/2019
Tuesday
2/26/2019
Wednesday
2/27/2019
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
time
LA90

Exhibit 4

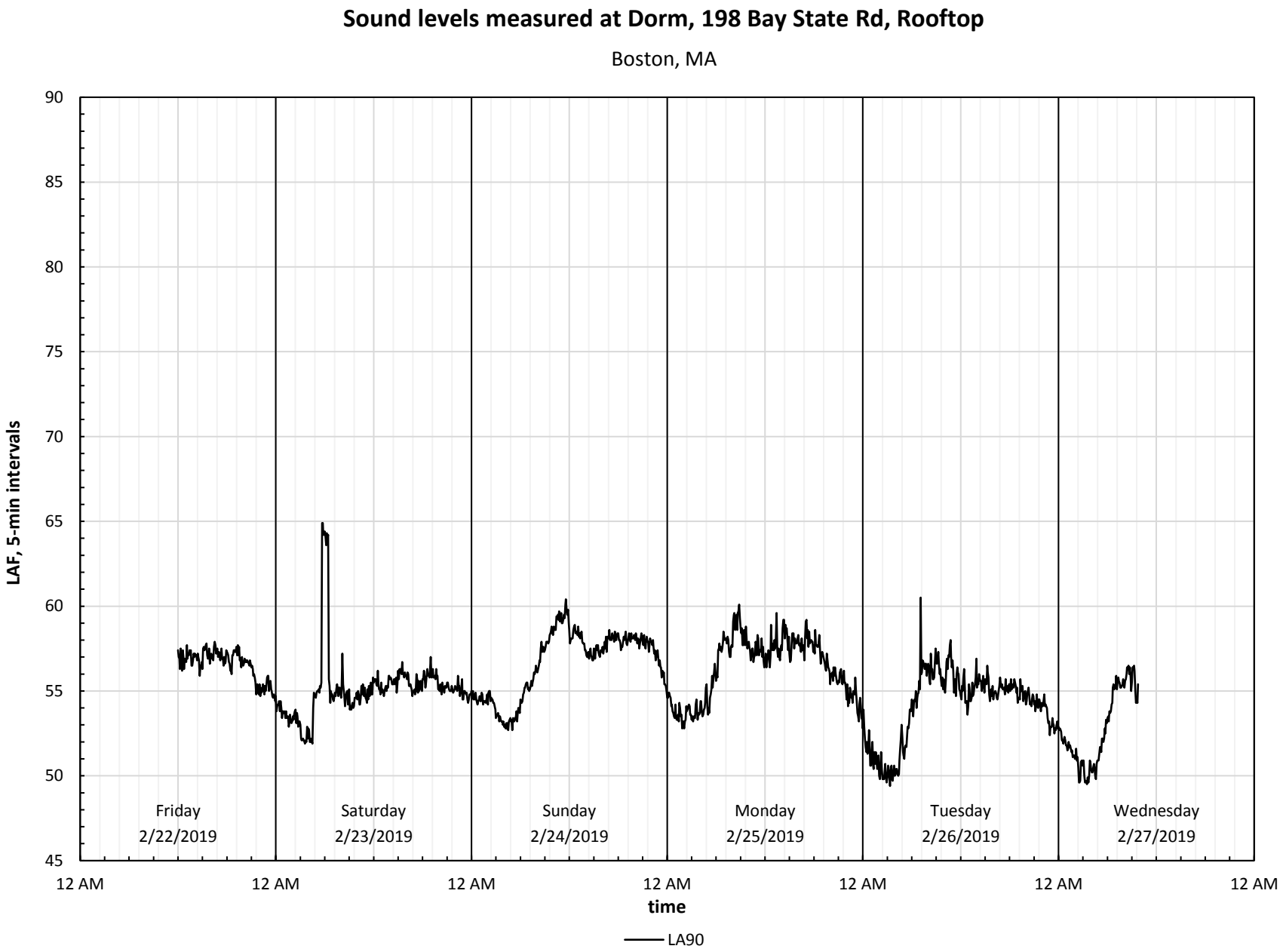
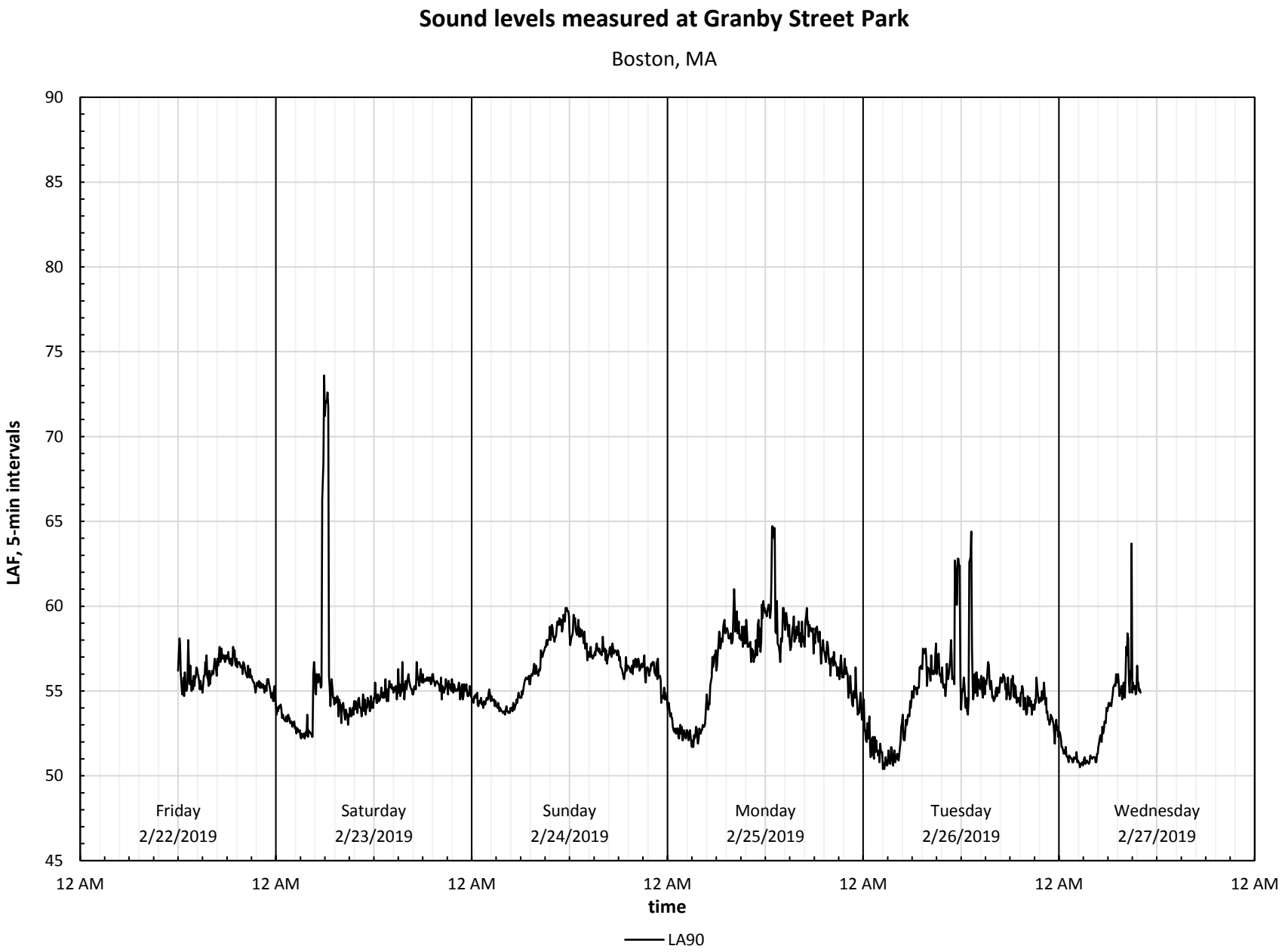

Sound levels measured at Dorm, 198 Bay State Rd, Rooftop
Boston, MA
LAF, 5-min intervals
90
85
80
75
70
65
60
55
50
45
Friday
2/22/2019
Saturday
2/23/2019
Sunday
2/24/2019
Monday
2/25/2019
Tuesday
2/26/2019
Wednesday
2/27/2019
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
time
LA90

Exhibit 5


Sound levels measured at Granby Street Park
Boston, MA
LAF, 5-min intervals
90
85
80
75
70
65
60
55
50
45
Friday
2/22/2019
Saturday
2/23/2019
Sunday
2/24/2019
Monday
2/25/2019
Tuesday
2/26/2019
Wednesday
2/27/2019
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
12 AM
time
LA90

Attachment I

DAYLIGHTING ANALYSIS

REPORT

BOSTON UNIVERSITY DATA SCIENCES CENTER

DAYLIGHTING ANALYSIS

PROJECT #: 1400479

MARCH 27, 2019

SUBMITTED TO

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1. INTRODUCTION

The proposed Boston University Data Sciences Center Building located in Boston, MA will consist of a 19 storey above-grade building on the Boston University Campus, at the intersection of Commonwealth Avenue and Granby Avenue.

RWDI was retained to investigate how this proposed tower will effect the availability of daylight (i.e. light emanating from the sky dome, rather than directly from the sun) to the neighborhood. (Figure 1).

This report presents the results of that analysis which was conducted as per Article 80 (Section 80B-2c), using the BPDA's Daylight Analysis Program (BRADA). The results of this analysis for both the proposed condition as well as existing daylight obstruction due to other nearby properties are included for comparison.

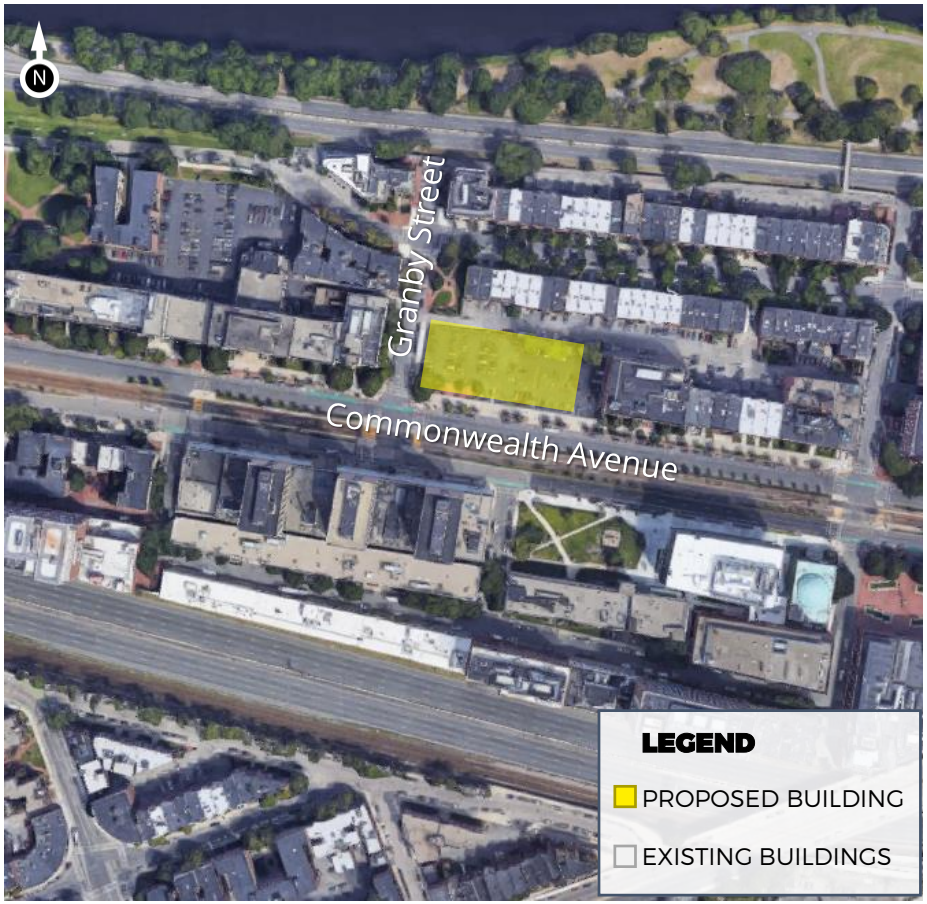

Figure 1: Location of the proposed BU Math and Data Science Building. Aerial View of Site and Surroundings (Credit: Google™ Earth).

Daylight Analysis Methodology

Boston, like most major cities around the world, has regulations in place designed to prevent excessive shadows from buildings impacting public spaces. Boston also has the additional requirement to predict how a building will effect the amount of indirect light available at grade level.

The BPDA refers to this indirect light which comes from the sky dome (as opposed to light directly from the sun) as “daylight”, and have developed a tool known as BRADA which is required to be used in any daylight availability assessment.

BRADA was developed in 1985 by the Massachusetts Institute of Technology to estimate the amount of the sky dome visible to a pedestrian given their direction of view and the surrounding urban context. Given basic geometric information (e.g. building heights, setbacks, location of the viewer, etc.), BRADA will produce a two-dimensional ‘map’ illustrating an approximation of the pedestrian’s view as well as a numeric score from 0 to 100% denoting the percentage of the sky dome within a given field of view which is obstructed.

The modelling typically uses the midpoint of an adjacent right-of-way as the location of the viewer.

In an urban context, reflective facade materials can act to reduce the perception of a loss of daylight due to the increased in reflected light. BRADA can optionally consider the effect of facade reflectivity when calculating the perceived loss of daylight. In this analysis however, the building facades have been treated as non-reflective in the interest of providing a conservative estimate.

Assumptions and Limitations

Climatic Impacts

BRADA uses a purely geometric analysis for a specific point of view, and does not account for any climatic impacts which also significantly effect the daylight distribution (e.g. cloud cover, position of the sun, light from "behind" the direction of view, etc.). Therefore the reduction in daylighting predicted herein should not be used for any daylight availably assessments beyond the Article 80 requirements.

Study Building and Surrounds Models

The analysis was conducted based on the geometry provided by KPMB Architects to RWDI on August 15, 2018. The surroundings model was developed based on data made available by the City of Boston. Due to the constraints of BRADA, the exact form of the tower could not be explicitly modeled. Therefore, a simplified building form was studied. All simplifications were made in a conservative fashion (i.e. they act to slightly increase daylight obstruction). BRADA analyses also only investigate reduction in daylight caused by buildings within the projected property lines of the proposed development, thus any cumulative impacts involving the larger urban context are not included in the BRADA analysis.

Facade Material Reflectance

All facades in this analysis were assumed to be entirely non-reflective as a conservative assumption.

Applicability of Results

The results presented in this report are highly dependent on the form of the proposed building. Should there be any design changes, RWDI should be contacted and requested to review their potential impact on the findings and conclusions of this report.

4. RESULTS - BRADA

Three view points were selected for this analysis:

1. Commonwealth Avenue – This viewpoint is located at the centerline of the avenue, centered on the southern facade of the building.
2. Granby Street – This viewpoint is located at the centerline of the street, centered on the western facade of the building.
3. North Side Alley – This viewpoint is located at the centerline of the street, centered on the northern facade of the building.

In addition, three other view points were selected for comparison of nearby buildings for their obstruction of "daylight" coming from the sky dome. These are as follows:

4. North Side Alley– This viewpoint is located at the centerline of the street, centered on the northern facade of an existing building (635 Commonwealth Avenue).
5. Commonwealth Avenue – This viewpoint is located at the centerline of the street, centered on the northern facade of an existing building (610 Commonwealth Avenue).
6. Hinsdale Mall – This viewpoint is located at the centerline of the street, centered on the western facade of an existing building (700 Commonwealth Avenue).

A plan view of the approximate locations of the viewpoints is illustrated in Figure 2 at right, and the findings are discussed in detail beginning on page 6.

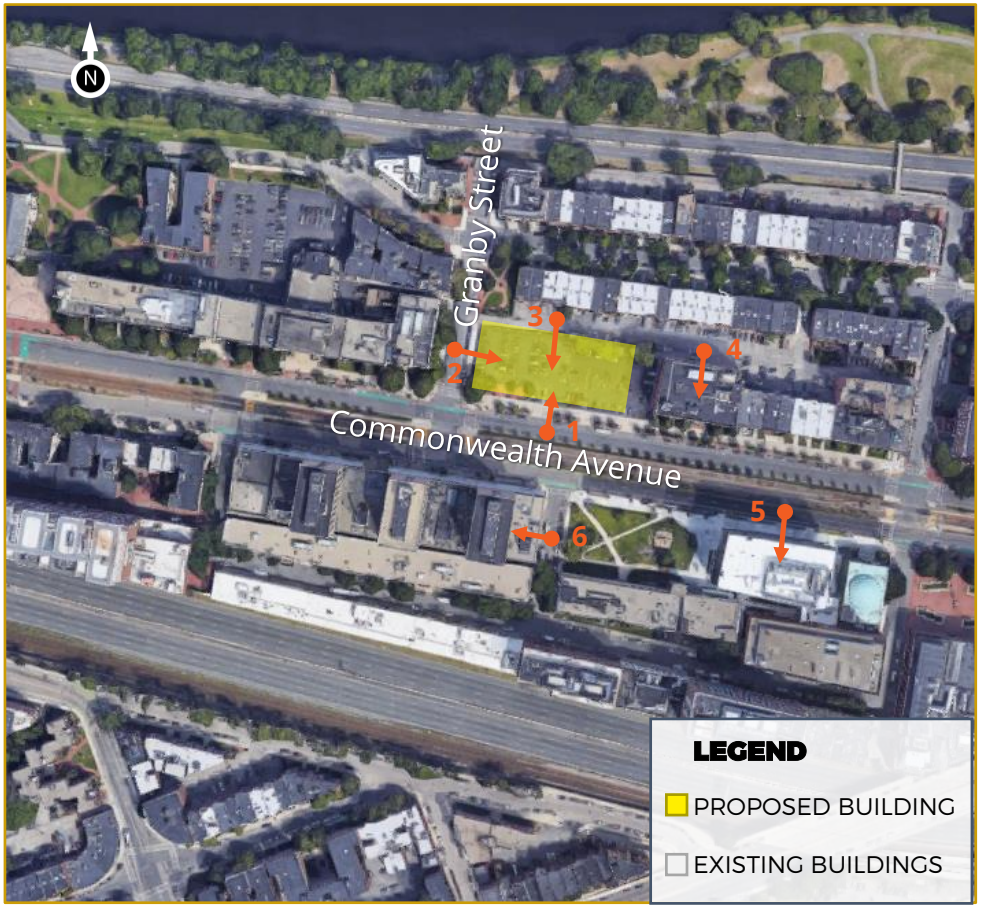

Figure 2: Approximate locations of the view points used in the BRADA study

Commonwealth Avenue (Viewpoint 1)

Proposed Condition

There is no existing structure at the site and therefore all of the obstruction offered is new. The obstruction offered from this viewpoint is 65.5%.

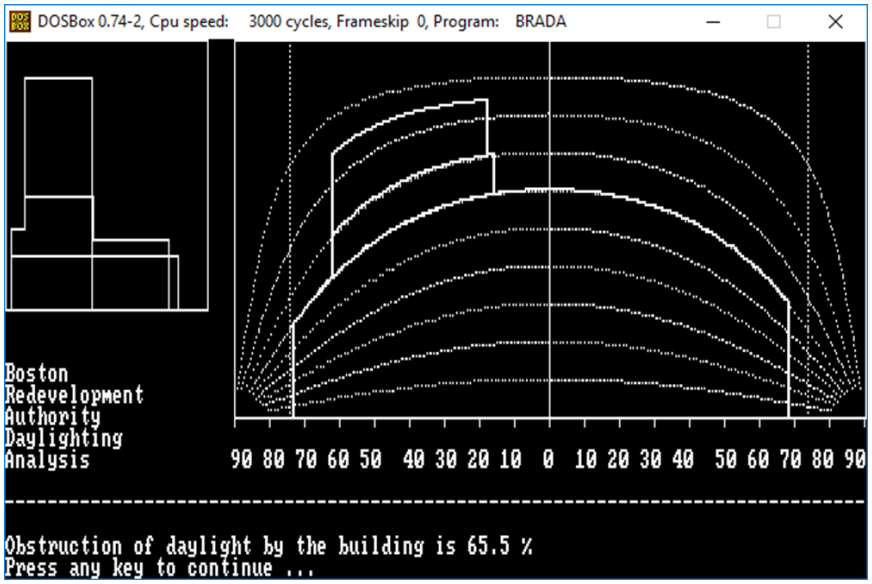

Figure 3: BRADA output for the Commonwealth Avenue viewpoint under proposed conditions

Granby Street (Viewpoint 2)

Proposed Condition

There is no existing structure at the site and therefore all of the obstruction offered is new. The obstruction offered from this view point is 82.2%.

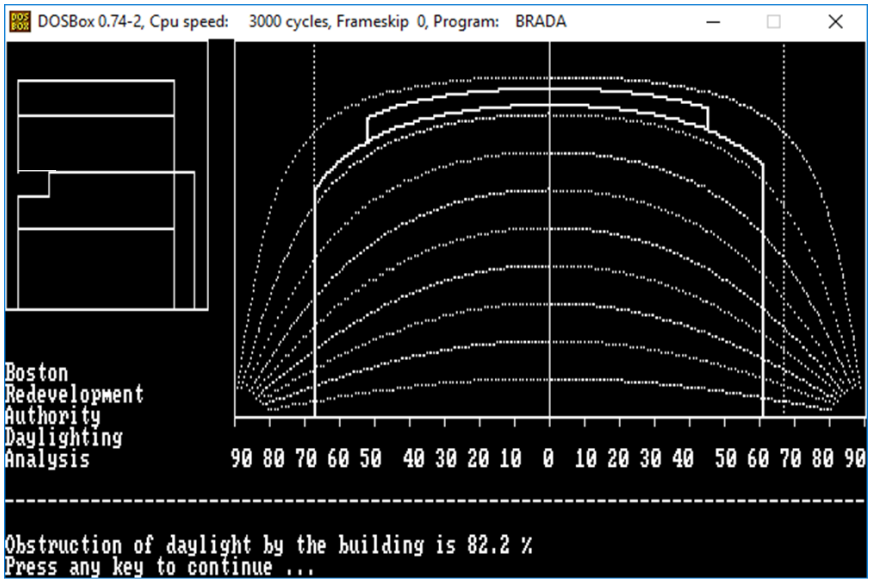

Figure 4: BRADA output for the Granby Street viewpoint under proposed conditions

North Side Alley (Viewpoint 3)

Proposed Condition

There is no existing structure at the site and therefore all of the obstruction offered is new. The obstruction offered from this view point is 48.9%.

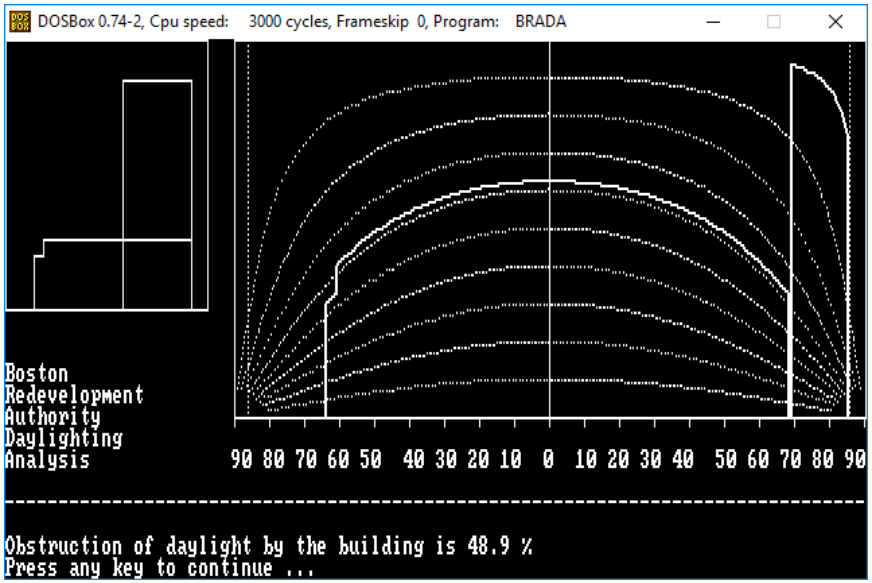

Figure 5: BRADA output for the North Side Alley viewpoint under proposed conditions

North Side Alley (Viewpoint 4)

Comparison Condition

This viewpoint is located at the centerline of the street, centered on the northern facade of an existing building (635 Commonwealth Avenue). This is presented for comparison of daylight obstruction with the proposed building. The obstruction offered by the existing building for this viewpoint is 85.1%.

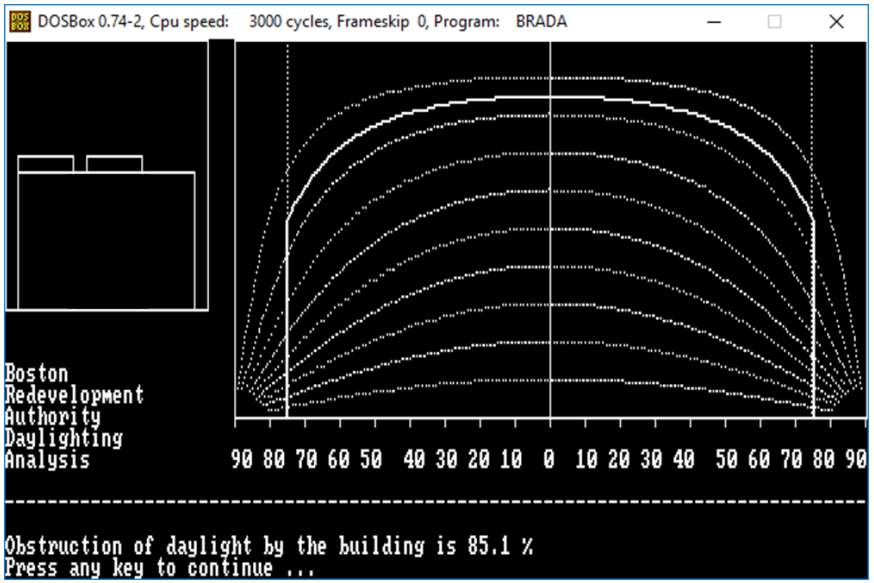

Figure 6: BRADA output for the North Side Alley viewpoint for the existing building

Commonwealth Avenue (Viewpoint 5)

Comparison Condition

This viewpoint is located at the centerline of the street, centered on the northern facade of an existing building (610 Commonwealth Avenue). This is presented for comparison of daylight obstruction with the proposed building. The obstruction offered by the existing building for this viewpoint is 83.5%.

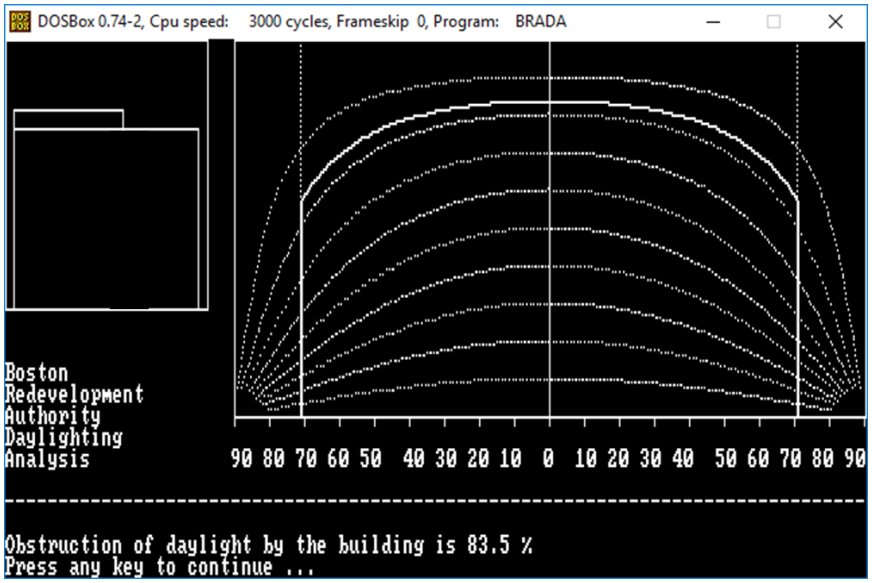

Figure 7: BRADA output for the Commonwealth Avenue viewpoint for the existing building

Hinsdale Mall (Viewpoint 6)

Comparison Condition

This viewpoint is located at the centerline of the street, centered on the western facade of an existing building (700 Commonwealth Avenue). This is presented for comparison of daylight obstruction with the proposed building. The obstruction offered by the existing building for this viewpoint is 73.3%.

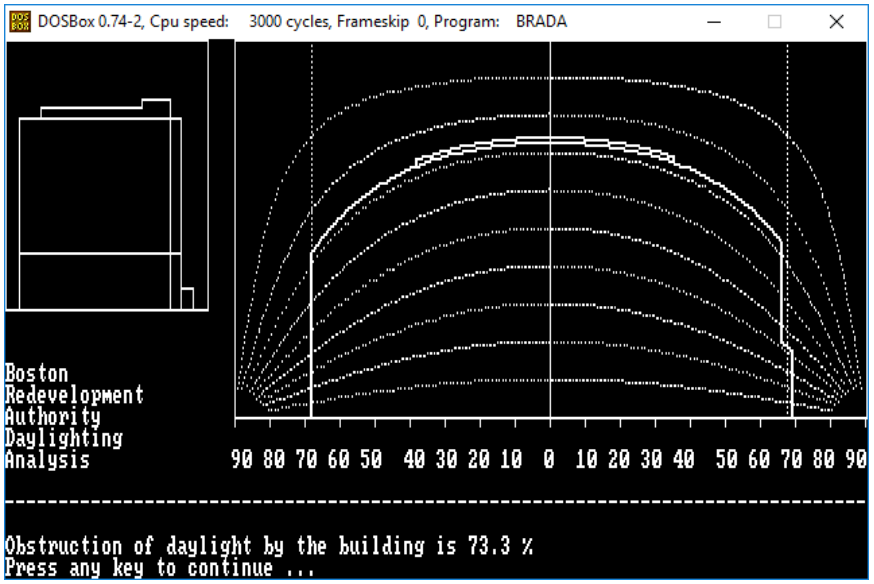

Figure 8: BRADA output for the Hinsdale Mall viewpoint for the existing building

5. CONCLUSIONS

1. The proposed site of the Boston University Math and Data Science Building is currently a surface parking lot, thus any new construction would increase daylight obstruction. The goal of this study was to compare the daylight obstruction of the proposed design to the obstruction caused by similar buildings in the neighborhood.

2. While the proposed building is taller than existing buildings in the vicinity, the form of the building reduces the relevant impact of the daylight obstruction for most potential view points.

3. The daylight obstruction for the proposed building was calculated for three views from public access streets, and compared to impacts from three similar buildings in the vicinity. The daylight obstruction from the proposed building was found to be comparable to the existing buildings.

4. The proposed building obstructs daylight by 49% to 82% depending on the viewing direction, and the existing buildings in the vicinity also obstruct daylight by 73% to 85% depending on the viewing direction.

5. Overall, the impacts predicted by BRADA indicate that the level of obstruction to the sky dome due to the proposed tower is comparable to what already existing in the neighborhood.

Attachment J

BROADBAND QUESTIONNAIRE

CITY of BOSTON | boston planning & development agency

ARTICLE 80 DESIGN REVIEW
BROADBAND READY BUILDINGS QUESTIONNAIRE

The City of Boston is working to cultivate a broadband ecosystem that serves the current and future connectivity needs of residents, businesses, and institutions. The real estate development process offers a unique opportunity to create a building stock in Boston that enables this vision. In partnership with the development community, the Boston Planning and Development Authority and the City of Boston will begin to leverage this opportunity by adding a broadband readiness component to the Article 80 Design Review. This component will take the form of a set of questions to be completed as part of the Project Notification Form. Thoughtful integration of future-looking broadband practices into this process will contribute to progress towards the following goals:

1. Enable an environment of competition and choice that results in all residents and businesses having a choice of 2 or more wireline or fixed wireless high-speed Internet providers
2. Create a built environment that is responsive to new and emerging connectivity technologies
3. Minimize disruption to the public right of way during and after construction of the building

The information that is shared through the Project Notification Form will help BPDA and the City understand how developers currently integrate telecommunications planning in their work and how this integration can be most responsive to a changing technological landscape.

Upon submission of this online form, a PDF of the responses provided will be sent to the email address of the individual entered as Project Contact. Please include this PDF in the Project Notification Form packet submitted to BPDA.

SECTION 1: GENERAL QUESTIONS

Project Information

- Project Name: ***Boston University Data Sciences Center***
- Project Address Primary: ***665 Commonwealth Ave, Boston MA 02215***
- Project Address Additional:
- Project Contact (name / Title / Company / email / phone) ***Judith Kohn jkohn@fpa-inc.com***
- Expected completion date ***TBD, appx 2022***

Team Description

- Owner / Developer ***Boston University***
- Architect ***KPMB Architects***
- Engineer (building systems): ***BR+A Consulting Engineers***
- Permitting: ***Fort Point Associates, Inc.***
- Construction Management ***Suffolk Construction***

SECTION 2: RIGHT OF WAY TO BUILDING

Point of Entry Planning

Point of entry planning has important implications for the ease with which your building's telecommunications services can be installed, maintained, and expanded over time.

#1: Please provide the following information for your building's point of entry planning (conduits from building to street for telecommunications). Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of Points of Entry: ***(2)***
- Locations of Points of Entry: ***Dedicated MDF/Entrance Room serving two distinct routes***
- Quantity and size of conduits: ***(8) 4" Conduits; (4) 4" Conduits to each entry***
- Location where conduits connect (e.g. building-owned manhole, carrier-specific manhole or stubbed at property line): ***Conduits will intercept existing conduits within the Boston University/Verizon shared manholes system located within the alleyway running parallel to Commonwealth Ave.***
- Other information/comments. Additional conduits are required within the public way on Silber St to complete the required conduit route.

#2: Do you plan to conduct a utility site assessment to identify where cabling is located within the street? This information can be helpful in determining the

locations of POEs and telco rooms. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- ***Boston University has completed an assessment of the required utilities***

SECTION 3: INSIDE OF THE BUILDING

Riser Planning

Riser capacity can enable multiple telecom providers to serve tenants in your building.

#3: Please provide the following information about the riser plans throughout the building. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- Number of risers – ***(2)***
- Distance between risers (if more than one) ***TBD***
- Dimensions of riser closets – ***BU standard is 8'x6' for telecom rooms, risers will be included in the telecom room.***
- Riser or conduit will reach to top floor ***- Yes***
- Number and size of conduits or sleeves within each riser – ***(4) 4" Conduit Min***
- Proximity to other utilities (e.g. electrical, heating)- ***UPS power panels will be located within the Telecom Rooms. All other utilities not serving the space will be restricted from entering the space.***
- Other information/comments

Telecom Room

A well designed telecom room with appropriate security and resiliency measures can be an enabler of tenant choice and reduce the risk of service disruption and costly damage to telecom equipment.

#4: Please provide the following information about the telecom room plans. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

- What is the size of the telecom room? – MDF Room (Main Tel/Data Entry) is approximately 11' by 35' and is located in the Lower Level (First Basement Level)

- Describe the electrical capacity of the telecom room (i.e. # and size of electrical circuits) –
- ***A new central UPS sized for 200 kW of power shall be provided to serve the building telecom loads. UPS power will be provided to each of the telecom rooms, the UPS will have a minimum of 15 minutes run time and generator backup. A minimum of (3) circuits***

per telecom room will be provided

- Will the telecom room be located in an area of the building containing one or more load bearing walls? – Yes, located adjacent to north foundation wall.
- Will the telecom room be climate controlled? - ***Yes***

- If the building is within a flood-prone geographic area, will the telecom equipment will be located above the floodplain? – The building is not in a FEMA SFHA (Special Flood Hazard Area) or in areas identified by the City of Boston as future flooding locations. The telecom equipment will be located above the nearest mapped flood elevation.

- Will the telecom room be located on a floor where water or other liquid storage is present? – No

- Will the telecom room contain a flood drain? – No.

- Will the telecom room be single use (telecom only) or shared with other utilities? - ***Telecom only***

- Other information/comments

Delivery of Service Within Building (Residential Only)
Please enter 'unknown' if these decisions have not yet been made or you are presently unsure. Questions 5 through 8 are for residential development only.

#5: Will building/developer supply common inside wiring to all floors of the building? – ***NA***
#6: If so, what transmission medium (e.g. coax, fiber)? Please enter 'unknown' if these decisions have not yet been made or you are presently unsure. ***-NA***
#7: Is the building/developer providing wiring within each unit? ***-NA***

#8: If so, what transmission medium (e.g. coax, fiber)? Please enter 'unknown' if these decisions have not yet been made or you are presently unsure. ***-NA***

SECTION 4: ACCOMMODATION OF NEW AND EMERGING TECHNOLOGIES

Cellular Reception

The quality of cellular reception in your building can have major impacts on quality of life and business operations.

Please provide the following information on your plans to facilitate high quality cellular coverage in your building. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

#9: Will the building conduct any RF benchmark testing to assess cellular coverage? -***Unknown***

#10: Will the building allocate any floor space for future in-building wireless solutions (DAS/small cell/booster equipment)? -***Unknown***

#11: Will the building be providing an in-building solution (DAS/ Small cell/ booster)? -***Unknown***

#12: If so, are you partnering with a carrier, neutral host provider, or self-installing? –***Neutral***

- Carrier
- Neutral host provider
- Self-installing

Rooftop Access
Building rooftops are frequently used by telecommunications providers to install equipment critical to the provision of service to tenants.

Please provide the following information regarding your plans for roof access and usage. Please enter 'unknown' if these decisions have not yet been made or you are presently unsure.

#13: Will you allow cellular providers to place equipment on the roof? -***Unknown***

#14: Will you allow broadband providers (fixed wireless) to install equipment on the roof? -***Unknown***

SECTION 5: TELECOM PROVIDER OUTREACH

Supporting Competition and Choice

Having a choice of broadband providers is a value add for property owners looking to attract tenants and for tenants in Boston seeking fast, affordable, and reliable broadband service. In addition to enabling tenant choice in your building, early outreach to telecom providers can also reduce cost and disruption to the public right of way. The following questions focus on steps that property owners can take to ensure that multiple wireline or fixed wireless broadband providers can access your building and provide service to your tenants.

#15: (Residential Only) Please provide the date upon which each of the below providers were successfully contacted, whether or not they will serve the building, what transmission medium they will use (e.g. coax, fiber) and the reason they provided if the answer was 'no'. N/A

- Comcast
- RCN
- Verizon
- NetBlazr
- Starry

#16: Do you plan to abstain from exclusivity agreements with broadband and cable providers?

- Yes

#17: Do you plan to make public to tenants and prospective tenants the list of broadband/cable providers who serve the building? ***Not Applicable***

- Yes
- No
- Unknown

SECTION 6: FEEDBACK

The Boston Planning and Development Agency looks forward to supporting the developer community in enabling broadband choice for resident and businesses. Please provide feedback on your experience completing these questions.

Attachment K

ARTICLE 80B-8 DISCLOSURE (UNDER SEPARATE COVER)

Attachment L

BOSTON SMART UTILITIES CHECKLIST (UNDER SEPARATE COVER)