RHODE ISLAND CONVENTIONS CENTER AUTHORITY

Solicitation Information

March 9, 2018

ADDENDUM #3

Title: Garrahy Courthouse Parking Garage #GCG2018

Attached includes:

- As Noted in the "Notice to Bidder" dated March 8, 2018: The Bid Due Date originally scheduled for Wednesday, March 14, 2018 at 1:30pm is being extended to Tuesday, March 20, 2018 at 1:30 pm.

- Sealed Bids must be received at the office of:

  The Rhode Island Conventions Center Authority
  Dunkin Donuts Center- Third Floor
  One LaSalle Square
  Providence, RI 02903
  Attention: James P. McCarvill, Executive Director

- Attached includes:
  - Notice to Bidders # 1 issued and posted March 8, 2018
  - RFI Answer Matrix
  - VHB Traffic Study
  - Specification sections to be used in lieu of sections issued in the original request for bids:
    - Section 316613 Compacted Aggregate Piers and Grouted Compacted Aggregate Piers
    - Section 081113 Hollow Metal Doors and Frames
  - Project Permit Notice

MARCH 9, 2018

	QUESTIONS	ANSWERS
1.	Please provide the architectural color renderings which were displayed in your presentation this morning at the Garrahy Courthouse Parking Garage Pre-Bid Conference.	See color renderings attached to Addendum # 2
2.	On Drawing S-100 along Column Line 1 and extending around the corner of the building at Column Lines A & D, there is a section mark 5/S-513. This detail calls for a grade beam but does not call out its size, nor on S-100 does it show the length/extent. Please supply this information.	The grade beam detailed in 5/S-513 spans from A/1 to D/1, from A/1 to the column between D/1.6 and D2, and from D/1 to D/1.6. The beam is discontinuous at column locations.
3.	Is there supposed to be a grade beam or spread footing along Column Lines A&D between Column Lines 7&8? Nothing is shown, however there is a small SF-2 in each area.	There does not need to be a grade beam or footing at those locations other than what is shown in the drawings. The SF-2 footings are to support the small precast walls at each entrance.
4.	On Drawing S-100, Foundation Note #9 states top of Grade Beam is the same as top of Slab. There are no top of slab elevations given on S-100. Please clarify.	That note refers to GB-1, GB-2, GB-3 and GB-4. The top of slab elevations are found on S-101
5.	Please provide more dimensional information on Drawings, S-511 thru S-514. There are no top of wall elevations provided and there are discrepancies in how wall thicknesses are shown between elevations and plans. For example, the wall on 1/S-511 is shown as 1'-0" thick, but in the plan view on S-420 the same wall is shown as 1'-4". All details on these sheets refer to the plans for top of wall/slab elevations but there are none provided with the exception of the shear walls along Column Lines B&C.	Top of wall elevations can be found on 2/S-420. The wall on 1/S-511 is labeled as 16" thick. As noted on 2/S-420, the top of CIP walls at Stair B are set to an elevation of 8'-6 ½" UNO. For bidding purposes, the top of the cast in place wall along 8-line is set to 10'-0" though step down in elevation is expected to be included in an upcoming addendum.
6.	Please provide Top of Pier elevations for 1/S-410.	8'6"
7.	E-mail address noted in the specs for submitting RFI's is different that the e-mails given on the RI Division of Purchases website. Please advise.	Per Addendum # 1 issued February 21, 2018, all RFI's were to be sent to both: gglines@walkerconsultants.com rhall@keoughconstruct.com and per instructions to bidders, Summary of Significant Dates, were to be sent no later than February 28, 2018 at 4pm
8.	Detail 11 on drawing A-548 shows a 4" deep x 8" high ADAIR limestone veneer but the specifications on page 044300-5 item B shows a 11-5/8" high split face veneer. Please advise the correct height to use.	**Height is to be 11 5/8".**
9.	On drawing A-402 details 1 & 3 dimensions on drawing show 8" CMU but see note 2 states 12" CMU with insulation please advise on what size CMU and will they be ground face block.	CMU is to be 12" ground face with insulation inserts at these locations.
10.	do you know who is doing the Special Inspections?	No
11.	The parking structure is drawn at 338' long with no expansion joint. Since this project is in the Northeast with larger thermal movements than what is considered in the PCI requirements, please	An expansion joint through the center of the garage was considered but deemed not necessary.

	QUESTIONS	ANSWERS
	advise how this parking structure should be bid. Should an expansion joint be added? This would be a large expense that is not shown on the drawings.	
12.	Will the following light fixture manufacturers and model numbers be acceptable as substitutions? Type F1 Eclipse Type F2 Williams Type F3 Williams Type F4 Williams Type F5 Williams Type F6 Williams Type F7 Cree Type F7 Valmont Type F8 Cree Type F8 Valmont Type ES1 Evenlite Type ES2 Evenlite Type ES3 Evenlite	Photometric calculations are required for substituted manufacturers as part of the shop drawings.
13.	Please provide a specification for hollow metal doors & frames.	**Spec. section will be issued in Addendum No. 3.**
14.	Elevator specification calls for two elevators while drawings show 3 elevators. Please confirm the number of elevators.	There will be a total or four (4) elevators as shown on the drawings. Two (2) in stair B, one (1) in stair A and one (1) in the Judges' lobby.
15.	Drawing S-541 Details 2, 3, and 4 show steel embed angle bearing connections to support the precast slabs at beams, landings, and connections to other slabs. Per note 12 under section III.D on S-001, this steel embed angle must be fireproofed to achieve the two-hour rating as required. In lieu of these connection details and fireproofing, can a concrete corbel or continuous ledge be provided to support the precast slabs at these bearing points?	Details 2, 3 and 4 on S-541 support members that do not have a fire rating requirement and do not have to be fireproofed.
16.	Drawing S-104 appears to show a precast wash on both sides of Line C, but only on the ramp side of Line B. Furthermore, the section cut of those two lines, 8 on S-540, shows a precast wash on the ramp side, but a "no wash condition" on the flat side. Please confirm if a precast wash should be provided at all low-ends of double tees, or whether the intent is for the non-ramp side to be without a precast wash.	The non-ramp side of Line B shall have a wash.
17.	The structural floor plans, S-103 and S-104, use the CIP hatching pattern to show the washes around the four (4) intermediate shear walls at Lines 2 and 4. However, section 7 on S-540 that is cut across these locations, shows a precast wash around the shear walls. Please confirm whether this wash will be CIP or precast.	The wash shall be precast except at between B/2 and C/2. Discuss with Walker if a CIP wash is preferred over a precast wash.
18.	Detail 3 on S-521 calls out a minimum double tee flange thickness of 4 5/8". We typically use a five inch (5") thick double tee flange to satisfy two (2) hour rating required.	This is acceptable.

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	Please confirm that this is acceptable.	
19.	Varying Double tee depths Typical Floor Plans S-102 thru S-104 call for 30" deep double tees. Roof & Roof ramp S-104 & S-105 call for 34" deep tees. Architectural drawings call for 8'-2" head room required. Given that floor to floor height is 11'-4" Is it acceptable to use a 35" deep double tee (30" stem + 5" flange) at all locations?	The double tee depths shall be as per the documents.
20.	Drawings A-201 Elevation 2 has two notes that call out P/C Color 1 and two notes that call out P/C Color 2. All of these notes point to panels that have shading described in the Legend as Precast Concrete (Color No. 2). All panels on this elevation have that particular shading. Please clarify whether all panels on this elevation are Color 2 or if some are Color 1.	Sheet A-202 / East elevation all panel have color 2 shading
21.	Drawing A-202 Elevation 1 has a note that calls out the spandrels as P/C Color No. 2. However, the shading on this elevation indicates the spandrels as Color No. 1. Please clarify.	Sheet A-202 / south elevation all the spandrel has color 1 shading.
22.	The Architectural Elevations on drawings sheets A-201 and A-202 reference two (2) different Precast Concrete Colors, that are to "match architect sample." Please provide mix design constituents used to prepare the Architects samples; i.e. cement color or blend, pigment color, aggregate source type, size & color. Please clarify the two (2) different mix designs that are to be used on this job.	See arch. 3d rendering from V3A for color type.
23.	Drawings A-331 Elevation 2 appears to show location of embeds for connection each mesh screen panel to the precast structure. Note says Precaster to coordinate location, size, and loads with misc metal. We do not know enough about the mesh screen system to determine all of the connection requirements at this time. Once a supplier is identified embeds can be coordinated. Typically the size and type of embeds required are designed and provided by the selected screen fabricator/installer as needed to suit their system. Location of embeds are then coordinated with the precaster during the shop drawings phase. For Bidding purposes, please provide an estimated quantity so we can account for labor to install these embeds into the precast formwork prior to casting.	For bidding purposes provide 8"x8"x1/2" plates with the spacing and quantity as show on drawing 2/A-331 for each one of the mesh screen panels. See elevations for panel quantity.
24.	Detail 5 and 6 on A-321 call out embed plates by precaster for connection of the metal truss framing that supports the phenolic wall panel system. The same note says to coordinate location and load requirements with misc metal subcontractor. We do not know enough	For bidding purposes provide 8"x8"x1/2" plates with the spacing and quantity as show on drawing 2/A-331 for each one of the mesh screen

	QUESTIONS	ANSWERS
	about the metal truss wall panel system to determine all of the connection requirements at this time. Once a supplier is identified embeds can be coordinated. Typically the size and type of embeds required are designed and provided by the selected fabricator/installer as needed to suit their system. Location of embeds are then coordinated with the precaster during the shop drawings phase. For Bidding purposes, please provide an estimated quantity so we can account for labor to install these embeds into the precast formwork prior to casting.	panels. See elevations for panel quantity.
25.	Are the pre-bid meeting minutes available for review?	**NO**
26.	Please provide specific address/location/footprint/outline of the Marshalling Yard that is to be provided by the 195 Development Group for use by precaster.	I-195 Commission Lot 35 surrounded by Franklin St, Friendship St, Claverick St and Clifford St. See Lot 35 survey plan and I-195 overall lot plan attached to Addendum # 2.
27.	P-700, Detail P809. Regarding the pipe guards, are these for all piping on each level – sanitary, storm, garage waste and vent, or just for the insulated domestic water piping? Will these be F&I by the plumbing contractor or by others?	These detail are information only. The GC will furnish and install
28.	The GSI-1 thru 5. Will this be F&I by the site contractor?	All interceptors will be furnished and installed by the Plumbing Contractor
29.	FD-A, FD-B, and RD-A. Will this be F&I by the precast contractor which will supply the plumbing contractor with the drain bodies for installation at a later date?	The Plumbing Contractor will purchase the floor drains and furnish the portion that will need to be cast into the precast section to the Precaster. The Plumber will install the remainder of the drain during construction
30.	Will the plumbing contractor figure coring holes or supplying Schedule 40 sleeves to the precast contractor for installation?	The Plumbing Contractor shall core holes for his work.
31.	Drawing S-202 Building Elevations is listed in the specifications drawing list but it is not the Plan Package. Please provide drawing.	Drawing was listed in specifications in error and is not intended as part of the bid documents.
32.	Drawing S-573 Waterproofing and Expansion Joint Details is listed in the specifications drawing list but it is not the Plan Package. Please provide drawing.	Drawing was listed in specifications in error and is not intended as part of the bid documents.
33.	Drawing A-102 callout states Pipe Rail (see detail 3/650). There is no drawing A-650 in the plan package, nor is it listed in the specifications drawing list. Please provide drawing.	The detail for the pipe rail can be found on 3/A-550
34.	Drawing A-440 section callout states 1A-450. There is no drawing A-450. Please provide drawing.	The callout to drawing A-450 was included in error. Sheet A-450 was not intended to be included in bid documents.

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35.	Specification Section 012100 Allowances, details a unit price shall be furnished for disposal of Type A and B soil by the Ton. The bid form requests Price per the CY. Please confirm submitted unit prices for the disposal of contaminated soil allowance are to be per ton.	Please submit the unit price for disposal of Type A and B soils in **TONS**
36.	Specification Section 033000 Cast in Place Concrete states Provide in Bid 10 additional tons of placed reinforcement bars or wwf for inclusion in Project as Engineer directs. Return cost of unused portion to Owner at unit price stated on Bid Form. However, there is nothing on Bid Form requiring this unit price for placing an additional 10 tons of reinforcement. Please clarify.	**The cost of this is required to be included in the contract sum in accordance with specification section 033000. There will not be a line item in the bid form for this.**
37.	Specification Section 079233 Concrete Joint Sealants Article 1.3 Unit Prices states: in bid form state: Unit cost to rout, clean, prime, and seal all cracks as noted by Engineer / Architect prior to substantial completion based on quantity of 500 LF. Unit cost to rout, clean, prime, and seal all cracks as noted by Engineer / Architect during 1 year warranty period based on quantity of 500 LF. Please clarify if this is to be included in the contract sum. There is no line on bid form to include this information.	**The cost of this is required to be included in the contract sum in accordance with specification section 079233. There will not be a line item in the bid form for this.**
38.	Section 079500 Article 3.6 Maintenance states: Provide separate line item in bid price for 5 year maintenance program for vehicle rated seismic expansion joint system. Please clarify if this is to be included in the contract sum. There is no line on bid form to include this information.	**The cost of this is required to be included in the contract sum in accordance with specification section 079500. There will not be a line item in the bid form for this.**
39.	Note 11 on Drawing E-408 calls for conventional devices wired back to the control panel via modules to create an addressable system. Is it the intent to have the outlying devices zoned per floor or to have an addressable module for each and every individual device?	Provide zoning per floor.
40.	Specification section 260000 Electrical, Article 2.14 specifies addressable smoke detectors. Note 11 on drawing E-408 states all devices shall be conventional type. Which type of device should be provided? Note that both addressable and conventional smoke detectors have the same operating temperatures (32-100 degrees F) and neither are weatherproof.	Addressable smoke detectors are required in conditioned spaces as illustrated on the drawings. Weatherproof heat detectors shall be provided in non-conditioned/garage spaces. Provide weatherproof initiating devices as illustrated on the floor plans.
41.	Note 6 on drawing E-408 calls for 2 NAC alternately connected for each evacuation zone. The riser diagram shows 1 per evacuation zone? Which method is correct?	Provide 2 NAC alternately connected. The building evacuates as a single zone (not highrise)
42.	Drawing E-408 indicates a weather proof remote annunciator. Drawing E-401 indicates the annunciator location but does not indicate that it is weather proof. Which is correct? Note that the annunciator itself will not be weather proof but can be installed in a weather proof housing.	Provide remote annunciator housed in weatherproof housing with heater.
43.	On drawings E-300 through E-307 states, refer to security system drawings by Dane Tech for additional information. Please provide these drawings.	See Dane Tech Security Plans attached to Addendum # 2. Note: The contractor is to cover supply and install of conduits only. The RICCA

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		will be purchasing the equipment and install of same.
44.	Drawing E-800 shows (3) three 400A fused disconnect switches at the emergency generator. Are these disconnects supposed to be circuit breakers integral to the generator, or remote disconnects? If remote disconnects, will a tap box be required?	Remote disconnects are required. Provide separation between life safety, legally required standby and standby systems in accordance with NEC article 700.
45.	Drawing E-800 shows a Panel 21 (parking office) being fed from Panel 21G. This panel is not located on the drawings and the panel schedule does not indicate this panel. Please clarify.	Panel P21 has been deleted.
46.	Specification Section 260000 Article 2.14 states that there is a Sequence of Operation Matrix on the Plans. Please provide the sequence of operation matrix as it could not be located in the drawings.	Sequence of Operation Matrix shall be provided as part of the fire alarm system shop drawing startup and testing documentation.
47.	Please clarify the type of glazing at the storefronts, stairwell and spandrel. The plans call for insulated and ¼" tempered glass in the same elevation. Please note ¼" glass does not have 10 year warranty as called for.	¼" thick glazing to be provided at unheated spaces and 1" thick insulating glass to be provided at heated/conditioned spaces. Stair towers are unheated. Mercantile Space 112 is heated/conditioned. Spandrel glass at Mercantile Space 112 is to be insulating type.
48.	Specification section 316613, Article 3.6 B.1 "Place...geogrid in accordance with the section 312000 Earthwork." However, this specification section does not discuss geogrid. Is geogrid required on the project or is it at the discretion of the ground improvement designer? If required, please indicate the locations and type of geogrid.	There is no required geogrid for the Aggregate Piers. Geogrid may or may not be part of the approved design required from the ground improvement design engineer.
49.	In Specification Section 316613, Article 1.4.E., long-term differential settlement is ½-inch inch. However, on the Foundation Plan S-100, note 3 of the Foundation Notes indicates ¾-inch. Please clarify.	**"Design for a ¾" differential settlement"**
50.	The supplemental geotechnical report and Specification Section 316613, Article 3.1.A. indicate that installation measures shall include pre-drilling, pre-augering, etc. to penetrate fill. However, the specification indicates "…installation shall be performed using…methods that do not generate spoils." Please clarify.	It is the intent that any pre-drilling and pre-augering be completed in a manner which will result in little or no spoils being generated. Augers should be rotated as they are withdrawn to reduce the possibility of spoil being generated. Any minor amount of spoil should remain onsite.
51.	Please provide the locations and magnitude of uplift loads.	**"The garage as currently designed has no uplift."**
52.	Please provide a material for the Elevator Level Indicator numeral on the Elevator doors seen on Drawing AG-704.	Numerals to be paint or vinyl-die-cut.
53.	Detail 5 on Drawing AG705 and Section K of Spec 101400 calls for 8" cast aluminum lettering. Please provide a quantity for the text for estimating purposes. (Does the letter detail on Drawing A-201 noting "Graphic TBD" represent this sign	Exterior signage and text are to be determined. Detail 5/AG705 is intended to indicate the type of signs that will be located above the driveway entry/exits and the

	QUESTIONS	ANSWERS
	type? If so, confirm that this is 8" cap height and non-illuminated cast aluminum dimensional lettering.)	intended mounting of these signs. These signs will be part of Allowance No. 3.
54.	With respect to the mounting details for all signs. Spec 101400 directs you to the sign schedule for the mounting detail and the schedule on Drawing AG702 reads "TBD". Please confirm which mounting detail should be used for each of the sign types as there is significant cost differences between the mounting styles listed on Drawing AG705.	**CL-1 7/AG-705 and 8/AG-705** **CL-2 7/AG-705 and 8/AG-705** **L1 3/AG-705 and 4/AG-705** **P1 7/AG-705 (sim.)** **P2 1/AG-705** **P3 1/AG-705** **P4 1/AG-705** **P5 1/AG-705** **R1-1 1/AG-705** **R7-8 6/AG-705** **R7-8a 6/AG-705** **R7-31A 4/AG-705** **S1 7/AG-705 and 8/AG-705** **S2 7/AG-705 and 8/AG-705** **S3 7/AG-705 and 8/AG-705** **S4 1/AG-705** **S5 1/AG-705** **S6 1/AG-705** **S7 1/AG-705** **S8 1/AG-705** **S9 1/AG-705** **S10 1/AG-705** **S11 1/AG-705** **S12 1/AG-705** **S13 1/AG-705** **S14 1/AG-705** **S15 1/AG-705** **S16 1/AG-705** **VR1 3/AG-705 and 4/AG-705** **VR2 3/AG-705 and 4/AG-705** **VR3 3/AG-705 and 4/AG-705** **VR4 1/AG-705** **VR5 3/AG-705 and 4/AG-705**
55.	On drawing A321 the backup framing is called out as aluminum but the specifications call for cold-formed metal trusses. What is the material?	Back-up framing in base bid is to be a Performance Design. Base bid is to be cold-formed galvanized steel and all aluminum trusses are to be an alternate. (Alt. No. 2).
56.	On drawing A330 details 2 thru 4 please provide sizes and spacing information for the metal galv. supports behind the mesh panels.	The mesh screen panels are to be a performance design. Embed plates shown in details 1/A-331 and 2/A-331 and in detail 9/A-501 are intended to be an indication of the required scope for the embed plates at top and

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		bottom of each screen and at intermediate connection points where they occur.
57.	Specification section 101400 'Signage' Article 1.2B-3 lists specification section 101419 'Dimensional Letter Signage' as a related section regarding signs at Stair/Elevator tower entrances. Section 101419 is not provided in the bid documents, please provide.	Dimensional letter signs are not yet included in the design. However, exterior signage and text are to be determined and these signs would be part of Allowance No. 3.
58.	Traffic Study Pre-bid Meeting 2/21/18 Could you provide a copy of the traffic study for the Garrahy Garage that was referenced at the Pre-bid Meeting on 2/21/18?	**Yes, this can be provided.** **See VHB Traffic Study attached to Addendum # 3.**
59.	Soils Removal Section 004100 Bid Form, 012100 Allowances and 012200 Unit Prices paragraphs 3 and 6 The Bid Form has Unit Prices No. 1 & 2 in dollars per cubic yard ($/cy). Specification Section 012200 Unit Prices, paragraphs 3.1.A.2. and 3.1.B.2 say the unit of measure is to be Tons of Contaminated Soil. Section 012100 Allowances specifies the amount paid will be measured by the ton. Could you confirm that bidders should provide a unit price in cost per tons?	**The Unit Price Items No. 1 and No. 2 shall be provided in Dollars per Ton. Payment will be made in accordance with the weight slips received from the disposal facility.**
60.	Excavation Allowance 012100 Allowances paragraph 3 Could you confirm that Allowance No. 1 for $900,000 covers **ALL** soils excavation, handling, stockpiling, testing, transportation and disposal, and is not a supplemental value to cover contaminated materials only?	**Allowance No. 1 covers the cost for soil excavation, handling, stockpiling, testing, transportation and disposal. For purposes of this project, site soil is considered "contaminated". As such, excess site soil must be disposed at an appropriate facility.**
61.	Excavation Allowance 012100 Allowances paragraph 3 Could you clarify what is meant by "handling and excavating" in Allowance No. 1? Is it meant to include the act of loading soils into a truck and disposing or to include multiple handling and multiple locations of soils?	**The specifications do not dictate the contractor's means and methods to achieve the project objectives for soil disposal. The allowance covers the cost for soil excavation, handling, stockpiling, testing, transportation and disposal. Refer to the response to Item No. 63 for further information.**
62.	Tipping Fees Section 012100 Allowances and 01220 Unit Prices paragraph 6 Do unit prices for soils removal include the facility tipping fees?	YES **Yes, the unit prices shall include tipping fees.**
63.	Location of Soils Disposal Facilities Section 026100 Removal and Disposal of Contaminated Soil paragraph 3.7	**An application to dispose up to 15,000 tons of Contaminated Soil Type A, using existing analytical data, has been filed with the**

	QUESTIONS	ANSWERS
	During the pre-bid meeting on 2/21/18, it was mentioned that two local disposal facilities had agreed to take live loads for soils disposal from the Garrahy Garage site. Could you provide the names/locations of these facilities?	**operators of the Coventry Landfill located at 451 Arnold Road Coventry, Rhode Island. The application has been conditionally accepted pending identification of the contractor and the establishment of appropriate financial arrangements. This will allow soil to be excavated, loaded and transported to the facility without stockpiling and further testing. However, contractors are not being directed to use this facility.** **To obtain tipping fees to dispose Type A soil at the Coventry Landfill. Please contact:** **Tony DiGregorio** **General Manager** **DiGregorio Corporation** **23 Business Park Dr.** **Smithfield RI 02917** **(401) 640-2222 (cell)** **(401) 232-1400 (office)**
64.	Stockpiling of Contaminated Soil Type B Section 026100 Removal and Disposal of Contaminated Soil paragraphs 3.5.D and 3.6 Section 026100 specifies separate stockpiling of Contaminated Soil Type B to allow for testing. May we stockpile this material on the staging site two blocks away?	**Yes, the soil may be stockpiled at the staging area. Stockpiled soil must be placed on and covered with polyethylene sheeting. The location must also be secured to prevent access.** **Please note that the Type B soil shown around shown around Borehole B-6 can be grouped with Type A soil based on new criteria used by the Coventry Landfill. This will limit the amount of known soil that requires stockpiling.**
65.	Support of Excavation Section 018900 Site Construction Performance Requirements and drawing C-2 paragraph 1.6 Soil Support Section 018900 paragraph 1.6.A Soil Support specifies that the contractor shall support excavation in accordance with OSHA and other	**1. Yes, the Contractor can have leeway in the location of (temporary/permanent) excavation support structures, as long as the location conforms with Specification Section 018900, Paragraph 1.6.A and that: all excavation support work stays within the property limits,**

	QUESTIONS	ANSWERS
	regulations. Drawing C-2 shows sheet piling located approximately 3' off of the foundations. 1) May the contractor have leeway in the exact location of excavation supports? 2) May the contractor select means of support as long as it meets requirements of 018900? In other words, may the contractor use soldier piles and lagging or other means in lieu of sheet piling if they so choose?	**proposed adjacent construction can be built as indicated on the project drawings and specifications, utilities crossing or in the vicinity of excavation support structures can be accommodated, and all system components are Engineer approved.** **2. Yes, the Contractor can select the type of excavation support structure to propose, as long as all above requirements are met, including that the Engineer approval requirement.**
66.	Pavement Markings Section 099120 Pavement Markings and drawing C-2 Is it acceptable to perform all pavement marking work shown on drawing C-2 at the end of the project to coincide with pavement markings within the parking garage?	**Yes. Pavement marking within street right of way shall be per City of Providence's specifications. Any temporary stripping requires a Traffic Management Plan and approval from the City Engineer. Temporary pavement markings in the Garrahy Courthouse receiving/loading/parking area should be installed as soon as possible.**
67.	Pavement Markings Section 099120 Pavement Markings paragraph 2.4 The Pavement Marking Spec 099120 2.4 – says "Beads shall be used, if approved by owner" – could you confirm whether beads have been approved?	**Beads shall be used.**
68.	Utility Backcharges Pre-bid Meeting 2/21/18 and Section 018900 Site Construction Performance Requirements paragraph 1.2A We understood at the pre-bid conference that the Owner was responsible for costs associated with utility backcharges. Section 018900 states that these fees must be paid by the Contractor. Could you confirm who pays the utility backcharges?	The RICCA will pay all Utility related Backcharges.
69.	Utility Transfer Dates Section 011100 Summary of Work paragraphs 1.2.B.1.d & e Could you confirm the transfer dates for utilities? 1) National Grid electrical service 2) Cox Communications telecommunications service	See National Grid Schedule attached to Addendum # 2
70.	Re-build Sallyport Brick Wall Pre-bid Meeting 2/21/18 and note on drawing C-5	No as-built plans were available for the Sallyport walls. They are to be re-

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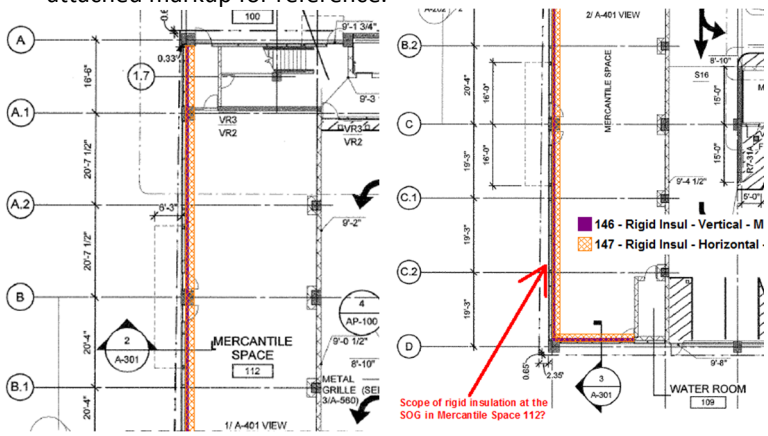
	Could you provide details for rebuilding the sallyport brick wall and gates at the end of the project?	built in-kind and gates reinstalled in kind.
71.	Access from Temporary Judge's Parking Lot Pre-bid Meeting 2/21/18, Section 011100 Summary of Work and drawing LOG-1 paragraph 1.2.B.1.g. Could you confirm the location of the temporary judge's parking lot? Section 01110 requires the contractor to construct and maintain "temporary pedestrian egress access way from Garrahy Courthouse rear entrance to Friendship Street with screen walls to Sallyport and to garage construction area." We understood from the pre-bid meeting that the judges would park in a temporary lot on the corner of Clifford and Richmond. Do the contractor need to provide an additional covered walkway for the judges from Clifford to the rear entrance?	The temporary Judges parking is located off site across Clifford St. The Judges will enter as they do now through the loading area. The pedestrian protection mentioned is for the general public and court employees entering and leaving through the back courthouse entry.
72.	Rhode Island Council for the Arts Drawing LOG-1 and Pre-bid Meeting 2/21/18 note 9 Could you confirm that the cost of artwork valued at 1% of construction cost is by the Owner and excluded from the contractor's bid?	The cost for the Art component valued at 1% of construction cost will be paid for by the RICCA.
73.	Pre-drilling of Aggregate Piers Section 316613 Compacted Aggregate Piers and Appendix B: Supplementary Geotechnical Engineering Report 316613 paragraphs 3.3.C and 3.3.D and page 5 of Geotech Report Section 316613 paragraph 3.3.C says that pre-auguring may be used in relatively dense soil areas. Pre-auguring produces some spoils, although fairly minimal. Paragraph 3.3.D says, “Pier installation shall be performed using displacement methods that do not generate spoils." The Supplemental Geotechnical Report recommends in 2.20.3 that pre-auguring be used due to soils conditions. Will spoils that result from the pre-drilling process be allowed?	**From a practical stand-point, there will be some amount of spoil generated with any pre-augering and/or displacement pier construction. Yes, a (minimal) drill spoil quantity will be generated. Yes, a drill spoil quantity should be allowed.**
74.	Ground Improvements Under Grade Beams Section 316613 Compacted Aggregate Piers paragraph 1.4.D Paragraph 1.4.D describes the bearing capacity required for soil augmentation products. Please confirm that grouted aggregate piers are not required under grade beams, as the grade beams, unlike footings, do not transfer vertical loads to the supporting soils.	**Ground improvement support of building grade beams is not required as grade beams are designed to transfer vertical load into the adjacent footings and not into the ground directly below the grade beam. Subgrade support of grade beams and structural slab does need to be sufficient to support the dead weight of the concrete and reinforcing steel during the initial concrete set period.**

	QUESTIONS	ANSWERS
75.	Soil Thickness Under Footings S-100 and Section 316613 Compacted Aggregate Piers Note 4 / S-100 and 316613 paragraph .2.A and 1.4.L Section 316613 requires the contractor to design the ground improvements; paragraph 1.4L specifically requires the contractor to design a system that will limit preparation of ground improvement elements into the footing pad. Foundation Information note 4 on drawing S-100 says footings "shall be installed on a 2-foot thick crushed stone or concrete pad." If design calculations by the ground improvements contractor suggest a different thickness of crushed stone under the footings, can the ground improvement contractor change the 2-foot required thickness?	Use the suggested thickness from the ground improvements contractor.
76.	Differential Settlement of FootingsS-100 and Section 316613 Compacted Aggregate Piers Note 3 / S-100 and 316613 paragraph 1.4.e Could you confirm the allowable differential settlement? Foundation Information note 3 on S-100 limits differential settlement to 3/4", but Section 316613 paragraph 1.4.e.3) specifies 1/2" maximum long-term differential settlement of adjacent footings.	Design for a ¾” differential settlement.
77.	Uplift Loads Section 316613 Compacted Aggregate Piers Could you provide the locations and magnitudes of the uplift loads related to the Garrahy Garage foundation?	The garage as currently designed has no uplift.
78.	Foundation Wall Backfill Limitations Section 310000 Earthwork paragraph 3.5.A.13 What are the limitations to backfilling the B1 Tier walls? Are they designed as retaining walls?	See details 3/S-513 and 2/S-513 for requirements for the B1 tier walls along Line B and Line C. Walls with soil on both sides shall be backfilled evenly. Remaining B1 walls have been designed as cantilevered retaining walls with a soil elevation up to what is shown on C-3.
79.	Precast Washes S-104 and S-540 details 7 and 8/S-540 Detail 8/S-540 shows the P/C concrete wash on the ramp side but not the flat level. Detail 7/S-540 includes a P/C wash on both sides of a shear wall. The "Architectural/Structural Plan Elevation Key" on S-104 indicates a pre-topped tee that looks like it has CIP infills and a topped tee that has a P/C wash. Could you clarify the requirement for precast concrete washes vs. cast-in-place infills?	Precast washes shall be on both sides on Lines B and C. The washes around the shear walls shall be precast except between B/2 and C/2. Locations of double tees with a cast a place infill include the ramp to each stair and the toppings detailed on sheet S-544.
80.	Ground Face Block Section 042000 Unit Masonry and drawing A-602 Finish Schedule	**Ground Face finish to be on interior/room side of CMU walls at Parking/Security Office 103 and Restroom 111 where exposed. CMU**

	QUESTIONS	ANSWERS
	The Unit Masonry spec indicates the walls at Parking/Security Office and other adjacent enclosures are to receive ground face. We assume all perimeter outer facing surfaces will be ground face. The finish schedule on drawing A-601 shows paint/GF for rooms Parking Security 103, Janitor Closet 110 and Rest Room 111. Please clarify which interior wall surfaces are to have a ground face finish.	**walls at interior/room side of Janitor's Closet 110 and Security Closet 114 are to be painted CMU.**
81.	Ground Face Block Section 042000 Unit Masonry and drawing A-602 Finish Schedule Will both sides of the separation wall between Garage and Mercantile Space along column line 1.6 have a ground face finish? We assume the garage facing side will be ground face. Please clarify the required finish for the side facing Mercantile Space.	**Only the face of the CMU partition wall at the Mercantile Space which is towards the Parking Area and Lobby Stair A needs to have Ground Face. Both faces of the CMU partition wall between Lobby Stair A and Vestibule 101 need to have Ground Face. Other faces can be standard.**
82.	Ground Face Block Section 042000 Unit Masonry and drawing A-602 Finish Schedule Will the interior side of Stair D walls on B1 Tier have a ground face finish?	**The walls surrounding Stair D on the B1 tier are to have Ground Face on both the exterior and the interior.**
83.	Ground Face Block Section 042000 Unit Masonry and drawing A-602 Finish Schedule On the Ground Tier will the walls within the alcove leading to Emergency Electrical Room 105 and Tel/Data Room 106 have a ground face finish or will they receive paint?	**The CMU walls surrounding Emergency Electrical Room 105, Main Electrical Room 104 and Tel/Data Room 106 need to have Ground Face on the exterior where visible to the public. Other faces can be standard.**
84.	Insulated CMU A-410 plan 4 On drawing A-410 insulated CMU is only indicated on plan 4. Should the entire elevator A shaft include insert insulation? Or will it be limited to certain walls/levels, if so please indicate where inserts will occur for elevator A and adjacent control room.	**Insulation inserts are only required at the Ground Face CMU walls surrounding Elevator Control Room 602 which is to be heated. The Ground Face CMU walls surrounding the elevator hoistway do not need to have insulation inserts.**
85.	Reinforcing Requirements for CMU Walls S-001 and S-560 S-001 notes; details 3 & 4/ S560 Structural general notes for masonry on drawing S-001 indicates minimum CMU wall vertical reinforcing to be #4 rebar at 18" on center (should this read 16"?). Details 3&4 on drawing S-560 indicate vertical reinforcing to be #5 rebar at 4' on center. Please clarify the size and spacing for reinforcement in CMU walls and if typical vertical spacing varies indicate such walls.	For typical CMU walls, provide #4 @ 16" OC.
86.	Aluminum Trusses Section 004100 Bid Form and Section 054400 Cold Formed Metal Trusses and Drawing A321 (facade details) Alt #2 and det 6/A-321	**Back-up framing for the exterior gypsum sheathing and phenolic wall panel cladding system is to be a "Performance Design" by the contractor. The base bid is to be**

	QUESTIONS	ANSWERS
	(typical) Alternate No. 2 requires bidders to provide all-aluminum truss framing support for the system of phenolic wall panels and gypsum sheathing in lieu of galvanized steel truss framing support. However, details on drawing A-321 indicate the base material would be aluminum. Could you confirm that specification 054400 supersedes notes on drawings that indicate aluminum? Please clarify Alternate No. 2 and the base scope for the trusses.	**cold-formed galvanized steel framing or trusses and the alternate is for the framing to be all-aluminum trusses (Alt. No. 2).**
87.	Signage Section 101400 Signage and drawings A-201, A-202 and AG Series various elevations Several signage areas in the elevations include no copy or ID type. Are the unmarked graphics to be considered part of the $70,000 allowance for future signage? Please clarify the following locations: - north elev on A-201 graphic above the clearance signs - north elev on A-201 blank sign panel over 2 bollards - south elev on A-202 blank sign panel	**Yes.**
88.	Waterproofing under Grade Beams S-510 and S-572 det 2/S-510 Could you provide a typical waterproofing detail for grade beam conditions? What is the waterproofing lap detail between the grade beam and the 10" structural slab-ongrade?	**For bidding purposes, the corner transition shown in 2/S-572 can be used as a guide. As noted on S-572 details provided are general and intended for guide only. Follow the manufacturer's recommended details.**
89.	Regarding angle supports for the mesh screens: Details on A-330 show (2) continuous 4"x4" angles welded together spanning along the top & bottom of precast spandrels to secure the mesh screen panels. After reviewing the stainless-steel screen panel details on A-331 it looks like there is only (1) 4"x4" angle that runs continuously along the top & bottom of the precast spandrels. The other 4"x4" angle seems to be welded to the continuous angle at intervals running the width of each screen. Please provide clarification on the correct detail to use and the thickness of this angle.	**For bidding purposes, both angles shall be continuous with a thickness of 1/2".**
90.	Do the embed plates at the spandrel panels for exterior façade applications shown on A-322 and 2/A-331 need to be cast into the panels or can they be field installed with expansion anchors? Please advise and, if acceptable, provide a detail indicating acceptable attachment methods.	**The use of expansion anchors may be acceptable but the location of each connection would have to be coordinated with the precast manufacturer. Detail to be provided by misc metals contractor. Generally, the bottom 1'-6" of a precast spandrel cannot accept anchor bolts because prestressed strands occupy this portion of the spandrel.**
91.	CIP wall detail on 5/S-514 notes that at the contractor's option plain concrete can be used to fill the void space below the 10" structural slab	**The intent of the plain concrete in detail 5/S-514 is to simplify forming**

	QUESTIONS	ANSWERS
	at B1 Tier. Details 3&4 on S-514 do not give an option and calls for plain concrete to fill the void between the ejector pit mat and the 10" structural slab. Please provide clarification – what are the requirements for the plain concrete fill? Is plain concrete required to fill the void space below the 10" structural slab or can stone/gravel be used as backfill?	**of the foundation and the waterproofing around the foundation. Use the same concrete mix as the spread footings. For detail 3/S-514 and 4/S-514, if the plain concrete fill is not preferred, a 12" CIP wall sim to the 12" CIP wall shown in 5/S-514 may be cast around the perimeter of the pit may be used. The void between the slab and the footing shall be prepared as per note 4 on S-101. Any remaining void space may be filled with crushed stone.**
92.	Alternate No.2 on the Bid Form calls for us to provide all-aluminum truss framing support system for the phenolic wall panels in lieu of galvanized steel support framing. Exterior wall panel details on A-321 show aluminum truss framing at the phenolic wall panels not galvanized steel. Please provide clarification for Base Bid vs. Alternate No.2 requirements.	**Back-up framing for the exterior gypsum sheathing and phenolic wall panel cladding system is to be a "Performance Design" by the contractor. The base bid is to be cold-formed galvanized steel framing or trusses and the alternate is for the framing to be all-aluminum trusses (Alt. No. 2).**
93.	Exterior wall section detail 3/A-301 calls for a pre-weathered steel panel system by FaçadeTek with a .60 EPDM waterproofing membrane over ½" DensGlass – please provide clarification for the following: • Spec 074233 – 'Phenolic Wall Panels' lists Trespa 'Meteon Lumen' as the basis-of-design – please provide clarification as to what anufacturer/model should be included in our bid. • Spec 072727 – 'Self Adhering Water Resistive Air Barrier Membrane' lists RevealShield SA (by VaproShield) which is a polypropylene membrane – please clarify the correct type of membrane to use. If different from the spec please provide a manufacturer.	**Exterior cladding is to be Phenolic Panels with the "Basis of Design" product to be the Trespa *Meteon Lumen*. The weather barrier over the gypsum sheathing behind the panel system is to be only a product approved by Trespa for use in NFPA 285 compliant wall assemblies. We understand the Revealshield SA by Vaproshield is approved by Trespa for use in NFPA 285 compliant wall assemblies. Contact Trespa for other products and manufacturers approved for use in NFPA 285 compliant wall assemblies.**
94.	Ground Tier enlarged floor plan detail 1/A-410 indicates the slab, insulation, and vapor barrier at Mercantile Space 112 are part of the tenant fit-out by others. S-102 calls for a 6" slab-on-grade to be poured in this area. Please clarify whether the 6" slab-on-grade and vapor barrier should be included in our bid.	**The rigid insulation, vapor barrier and slab-on-grade at Mercantile Space 112 are not to be installed until the tenant fit-out of the space and they are not to be included in the bid.**
95.	Section details 2&3/A-301 of the Mercantile Space bring us to detail 11/548. The curtain wall sill detail indicates fluid-applied waterproofing	**Fluid-applied waterproofing is required and is intended to act as the air barrier for the wall assembly.**

	QUESTIONS	ANSWERS
	with protection board at the exterior side. Please provide clarification on the following items: • Should this detail be revised to reflect damp proofing only at the exterior face? • Specs list two different types of fluid-applied waterproofing. If required, what type are we to carry? • Please confirm we are to carry rigid insulation up the curb and only 2'0 along the inside perimeter of Mercantile Space 112. Please see attached markup for reference.  	**Damproofing is not to be used at this location. Rigid insulation is to be carried up the wall on the inside face to the level of the underside of the future floor slab which will not to be installed until the tenant fit-out of the space and is not to be included in the bid.**
96.	Spec Section 084423 – Structural Sealant Glazed Curtainwalls lists "Sloped Glazing Assemblies" as a related section but it is not listed in the Table of Contents. We cannot find any sloped glazing assemblies on the plans. Please provide the missing spec and locations for sloped glazing assemblies.	**There are no sloped glazing assembly areas in this project.**
97.	Regarding Spec Section 084423 – Structural Sealant Glazed Curtainwalls: Under Part 2 – Products, 2.1A it says – note: "curtain wall system for installation in glass-back elevator shafts…to comply with regulations". We cannot find any details for this type of system on the drawings. Please provide details and locations for structural sealant glazed curtain wall assemblies.	**There are no glass-back elevator hoistways in this project.**
98.	Stair C at the Judge's Lobby is called out as a cast-in-place stair on A-420. Drawings 1/S-421 and 4/A-460 call for this stair to be a precast stair. Please provide clarification.	**The stair is to be precast concrete.**
99.	Wall section details on A-301 do not clearly define the scope of rigid insulation at any other walls except those at the Mercantile Space (2&3/A-301). Please provide clarification for rigid insulation requirements at the following walls/slabs: • Walls along column lines A&D • Deep foundation walls along column lines B&C • Slab-on-Grade at Ground Tier in the garage	**Rigid insulation with vapor barrier is to be provided at the underside of CIP concrete floor slabs in all conditioned spaces. This includes Elevator Control Room 002, Vestibule 101, Supply Room 102, Parking/Security Office 103, Main Electric Room 104, Emergency Electric Room 105, Tel/Data Room**

	QUESTIONS	ANSWERS
		107, Janitors Closet 110, Restroom 111 and Security Closet 114.
100.	Spec section 072600 – Vapor Retarders – Garage lists polyethylene vapor barrier at 6-mils thick and installation requirements beneath concrete floor slabs. Spec section 033000 – Cast In Place Concrete, 2.7A calls for underslab vapor barriers at no less than 15-mils thick. Please provide clarification on the following: • Please clarify the vapor barrier thickness at all slabs-on-grade • Does spec section 072600 only apply to vapor barriers applied to walls inside rooms within the garage?	**Provide under-slab vapor barrier at slab-on-grade of all conditioned spaces (see #99 above) in accordance with spec. section 033000. Spec. section 072600 only applies to vapor barriers in insulated stud wall and ceiling assemblies inside conditioned spaces where necessary (see #99 above).**
101.	Stair/Elevator 'A' roof plan detail 2/A-411 refers us to 1/A-525 for roof fascia & parapet details. Details of the roof fascia & parapet on A-421 & A-422 are missing at the Stair/Elevator 'B' Second Tier, Third Tier, and Roof. Please provide details for the roof fascia and parapet at these locations.	**Roof fascia and parapet details at Stair/Elevator B and at the Judges' Lobby are similar to the roof fascia and parapet details at Stair/Elevator A.**
102.	Detail 1/A-525 gives a dimension of 2'-6" at the top of the aluminum roof edge flashing. The top of the aluminum roof edge detail scales out to 1'-6" on drawings A-411, A-421, and A-422. Please clarify the width of the aluminum flashing at the roof parapets.	**The width of the top of the roof edge at the roof parapets is to be 2'- 6" as shown in detail 1/A-525.**
103.	Is the aluminum roof edge flashing called out in detail 1/A-525 a true coping cap, and as such part of the metal panel system, or just a gravel stop? Please advise as this size may be an issue to meet FM roof requirements.	**The aluminum roof edge flashing shown in detail 1/A-525 is intended as a transition between the vertical panel system and the membrane roofing.**
104.	There is no spec for sheet metal listed in the Table-Of-Contents. Please provide clarification on thickness of the aluminum roof edge flashing. Will a sheet metal spec be issued in an addendum?	**Sheet metal flashing is to be .080" thickness. A sheet metal flashing and trim specification will not be issued at this time.**
105.	Regarding the security fencing that is shown on A-102 at the secured entry/exit points – Detail 3/A-560 does not provide details on the finish of this security fencing. Please provide clarification as to whether this will be a factory painted or field painted item.	**Interior Security Fencing with gates shown on drawing A-201 at the secured vehicular entry/exit points is to be factory finished as indicated in specification section 323120.**
106.	CMU walls are called out to receive ground-faced finish at all exposed faces. Please confirm CMU block walls do not get painted. If CMU walls are to be painted, please confirm only the interior sides of CMU block walls will receive paint.	**Face of CMU walls at all public spaces/areas is to be a decorative ground face "GF" and these faces are remain exposed and are not to be painted.**
107.	Please confirm that steel bollards do not get painted and are to remain unfinished. Per the details on A-502 the bollards are to receive yellow guard covers over them.	**Bollards and base plates are to be HD Galvanized and only the exposed pipe and base plate at bottom of the bollard is to be painted safety yellow.**
108.	Please confirm that all concrete walls below-grade at B1 Tier (except for the Judge's Lobby) are not to receive paint.	**All concrete walls at the B1 Tier are not to receive paint except for**

<table>
<tr><th></th><th>QUESTIONS</th><th>ANSWERS</th></tr>
<tr><td></td><td></td><td>concrete walls in the Judge's Lobby and the adjacent egress Stair C.</td></tr>
<tr><td>109.</td><td>Room Finish Schedule on A-601 lists the wall finish at many of the rooms to be "Paint/GF". Does "GF" stand for Ground Face?</td><td>Yes. "GF" stands for ground face CMU which is to remain exposed and is not to be painted.</td></tr>
<tr><td>110.</td><td>Spec 142101 - Electric Traction Elevators specifies two different elevators; Elevator No.1 and No.2 – The drawings show a total of (4) elevators. Please provide a spec for all elevators on the project and corresponding number:
• Stair A (single bank, 1 elevator)
• Stair B (dual bank, 2 elevators)
• Judge's Lobby (single bank, 1 elevator)</td><td>All four elevators are to be 3,500 lbs. machine room-less electric traction elevators and they are all to be connected to emergency power. There are to be no glass-back elevators.</td></tr>
<tr><td>111.</td><td>Section 3.1.2 of AIA Document A305 asks for examples of previous projects attached to a separate sheet of paper. Items (b), (c), (dc), and (d) appear to be requests for this project. Are a schedule, logistics, and project approach required with our submission for this project?</td><td>YES</td></tr>
<tr><td>112.</td><td>Drawing A-601 lists two different types of overhead doors: type "F" and type "G". The door and frame schedule does not provide a designation type for any of the overhead doors but instead calls them out as "overhead grille doors" or "high speed overhead grille doors". Furthermore, the overhead door types called for at openings on AP-100 conflict with the descriptions given in the door and frame schedule on A-601. Please provide clarification for the following overhead door openings:
<table>
<tr><th>Door Opening</th><th>Mark</th><th>A-601</th><th>AP-100</th></tr>
<tr><td>117</td><td>?</td><td>Overhead Grille Door</td><td>High Speed OH Coiling Door</td></tr>
<tr><td>118A</td><td>?</td><td>Overhead Grille Door</td><td>High Speed OH Coiling Door</td></tr>
<tr><td>118B</td><td>?</td><td>Overhead Grille Door</td><td>OH Coiling Door</td></tr>
<tr><td>118C</td><td>?</td><td>Overhead Grille Door</td><td>High Speed OH Coiling Door</td></tr>
<tr><td>119</td><td>?</td><td>Overhead Grille Door</td><td>Overhead Coiling Door</td></tr>
<tr><td>120A</td><td>?</td><td>High Speed Overhead Grille Door</td><td>High Speed OH Coiling Door</td></tr>
<tr><td>120B</td><td>?</td><td>High Speed Overhead Grille Door</td><td>High Speed OH Coiling Door</td></tr>
</table></td><td>Doors 117, 118A, 118B, 118C and 119 are to be Overhead Coiling Grilles as specified in specification section 083326. Doors 120A and 120B are to be High Speed Overhead Coiling Doors with ventilated curtain slats. See revised specification section 083324 High Speed Overhead Coiling Doors issued in Addendum No. 2 for doors 120A and 120B.</td></tr>
<tr><td>113.</td><td>For the door openings listed above please provide clarification as to whether the overhead door at each opening is high speed or not.</td><td>Only doors 120A and 120B are to be High Speed Overhead Coiling Doors. These two doors have ventilated curtain slats. See revised specification section 083324 High Speed Overhead Coiling Doors issued in Addendum No. 2.</td></tr>
<tr><td>114.</td><td>Drawing C-4 shows (4) four existing site light poles with conduit on the property. Are these site light poles and associated conduit getting demolished? Please provide locations and routing for the new poles and lighting conduit on E-100 if they are to be replaced.</td><td>The four (4) existing site light poles and conduit are to be removed.</td></tr>
<tr><td>115.</td><td>There appears to be a parking/security booth on the Clifford Street entrance on drawing C-4 that has no designation for removal or demolition- please provide clarification.</td><td>1. The parking/security booth at the Clifford Street parking entrance shown on drawing C-4 is to be removed.
2. The contractor is responsible to remove the security booth,</td></tr>
</table>

	QUESTIONS	ANSWERS
		associated gates and operators and return to the court.
116.	Existing underground electrical that runs within the project boundaries, as shown on C-4 are assumed to be within the bidding GC's scope. Please confirm all electrical within the project boundaries is the responsibility of the GC and not the Electrical Utility Company.	The National Grid duct bank running across the site is being relocated to the new location shown on the plans. The contractor is responsible for installing the duct bank in the new location across the site only. National grid will meet that duct bank with their work. The RICCA will pay National Grid for all other work related to this
117.	The plans and specifications mention the use of Schedule 40 PVC conduit for exposed work. Will Schedule 40 PVC be allowed for all work exposed above grade such as branch lighting, power, etc.?	**If it is to be used, PVC conduit exposed above grade must be schedule 80 with all necessary supports and expansion joints when horizontal and with pipe guards when vertical where it could possibly be damaged by vehicles, etc.**
118.	Drawing E-800 shows a breaker for future car chargers. Will there be any installed on the project? If so, please provide locations for them. Will any branch conduit be required from main switchboard to their future locations?	**Electric vehicle chargers may be installed in the future. There will not be any branch conduit installed at this time for the future EV chargers.**
119.	Drawing E-800 shows several breakers for future mercantile spaces. Will any feeder conduit be required from main switchboard to future spaces? If so, please provide a routing diagram.	**There will be no feeder conduit installed at this time for the future mercantile spaces.**
120.	On all low voltage systems, such as telecom, security, card access, CCTV, etc. - please confirm we are responsible for providing conduits, back-boxes, and pull strings only. Do the electrical documents depict all requirements for all the low-voltage systems? Please provide clarification.	**On all low voltage systems, such as telecom, security, card access, CCTV, etc. you are responsible for providing conduits, back-boxes, and pull strings only. See security design drawings by Dane Tech.**
121.	Detail 3/A-525 calls for single-ply roof membrane over ¾" pressure treated plywood at the canopy roofs above the Lobby Entrances & Mercantile Storefront. Detail 1/A-548 does not show this material above the roofing. What is the material shown above the roofing in the detail?	There is to be no insulation material above the roofing. Use detail 1/A-548 for canopy roof.
122.	Detail 3/A-525 shows metal panel at the canopy run along the underside, extend up the face, and terminate. Please confirm this is correct. If not, please provide details indicating limits of the metal panel at canopies.	See detail 4/S-545 for structural elements.
123.	EPDM roofing spec calls for substrate board to be 5/8" Type "X" gypsum board and calls for a ½" Densglass cover board. Neither of these details are shown for the roof system at the canopy detailed on 3/A-525 – please provide clarification for the roof system at the canopies.	**EPDM roofing system at cantilevered entrance canopies is to comply with FM Approvals 4450 and 4470 as specified, with components as required. Rigid insulation is not to be provided at these locations.**

	QUESTIONS	ANSWERS
124.	With regards to precast colors sheet note #10 (A-201) states that colors are to match the architects sample. Please confirm that colors for precast will be manufacturer's standard colors. If not standard, please provide an allowance for all bidders to carry a custom color in their bids.	**Colors of architectural precast concrete are to match the colored perspective renderings by Vision 3 Architects.**
125.	Spec Section 034100 - Precast Structural Concrete lists, under the summary section, precast structural concrete with architectural finishes. Are custom form liners or custom finishes required for any of the structural precast items? Please provide clarification.	**There are to be no custom form liners or custom finishes for any of the structural precast items.**
126.	Elevation drawing 2/A-201 calls for precast concrete colors 1 and 2. According to the legend this elevation is to receive precast color 2. After reviewing drawing 2/A-442, however, the details call for the precast panels at this same area to be color 1. What is the correct color type for these precast panels?	Color type at precast panel on detail 2/A-442 is Color 2.
127.	Under the Special Notes to Contractors on LOG-1, Notes 4.4.3 and 4.4.4 call for the selective demolition of brick walls and wall footings around the sally port. Drawings C-2 and C-5 are vague and make a note to "rebuild existing masonry walls in kind". Please provide clarification for the following: • Are we to selectively demo all the brick walls and footings around the sally port, or only where the sheet piling is being driven and the ductbanks run under the walls? Would it be possible to show the limits of brick wall to be removed on the drawings? • For bidding purposes please provide footing & wall details for the new masonry walls to be constructed. Would it be possible to establish an allowance for all contractors to carry in their bids for this work? • Please clarify the extents of new masonry walls to be re-built on C-2 & C-5. The existing masonry wall along the side of the garage does not look like it will be re-built since the precast garage wall now occupies this location.	**The brick walls and footings around the Garrahy Courthouse Sallyport are to be demolished/cut back as needed to allow for the garage construction, to allow for egress from the courthouse to Friendship Street, and to allow for construction of the relocated NGrid ductbank between Friendship Street and Clifford Street. It is intended that these brick walls be reconstructed to match the appearance of the existing brick walls. No as-built or construction drawings of these walls brick are available. The brick wall along the side of the garage is to be rebuilt to the new property line with a space between it and the new garage.**
128.	Please confirm whether pipe guard detail P809 on drawing P-700 is required for all sanitary, storm, garage waste & vent piping on each level or just for the insulated domestic water piping at each level?	**Pipe guard detail P809 on drawing P-700 is required for all sanitary, storm, garage waste & vent piping and insulated domestic water riser piping on each level where these pipes could be damaged by a vehicle.**
129.	Utility plan C-4 shows several underground utilities running through the site. Except for the underground electrical (NGrid) and tel-data (Cox) lines that are to be re-routed can we abandon all existing utilities in place that are not active?	YES Note: there is also a Providence Fire Department alarm loop that runs parallel to the N-grid duct bank. This is to be relocated in the same corridor as the new N-Grid duct bank. The old alarm loop can then be abandoned.
130.	**Aggregate Piers:**	**If an obstruction to excavation and/or drilling is encountered, the**

	QUESTIONS	ANSWERS
	The contract documents state that the geotechnical reports indicate the presence of obstructions within the subsurface soils. The geotechnical report states obstructions include brick and concrete which would be likely remnants of former buildings. Obstructions would have an effect on support of excavation, excavation, utility installation, and aggregate piers however there is no quantity to assume in the bid for obstruction removal and there is no way to quantify the work and cost impacts that may be required to remove or accommodate obstructions. Based upon this inability to accurately predict and quantify potential obstructions, a specified contract allowance to reimburse the Contractor for all obstruction impacts and costs is requested. Otherwise, please clarify how bidders are supposed to quantify and include obstruction removal costs in our lump sum base bid and contract.	**Engineer should be notified immediately. During the excavation and/or drilling process, obstructions are defined as man-made or man-placed: objects, materials, structures, or rock of any type or size (excluding bedrock) occurring at or below ground surface that unavoidably and completely stop the progress of excavation and/or drilling work for more than one (1) hour, despite the Contractor's diligent efforts with suitable equipment and technique, as determined by the Engineer. Abandoned utilities and utility structures indicated on the contract drawings shall not be considered obstructions and, where removal or relocation is required, shall be paid under other applicable pay item(s). A budget for Engineer observed and approved (per-hour) obstruction removal time should be included, in addition to the Lump Sum for this work.**
131.	**Column Loads for Foundation Design** **Section 316613 Compacted Aggregate Piers** **Could you provide specific column loads, including the live load and dead load breakouts?**	**All footings have been sized for a gross allowable bearing pressure of 8000 psf and this design criteria is expected to be met. See notes on sheet S-001. If required, the live load and dead load breakout can be provided at a later date.**
132.	**Aluminum Trusses** **Drawings A-321 (façade details)** **6/A-321 (typical)** **Could you provide the design and sizing for the aluminum truss members in Alternate No. 2?**	**Back-up framing for the exterior gypsum sheathing and phenolic wall panel cladding system is to be a "Performance Design" by the contractor. The base bid is to be cold-formed galvanized steel framing and the alternate is to be all-aluminum truss framing (Alt. No. 2).**
133.	**It appears that there is conflict with the footings proposed on the corners of Richmond Street and the traffic poles/ foundations and the signal cabinet. Please provide clarification on how these units are handled during the construction of the foundations. see attached photos.**	**During construction this intersection could operate as a stop control (stop signs vs. the signal). This would need to be reviewed and approved by the City Traffic and Engineering.**

	QUESTIONS	ANSWERS
		For the mast arm pole at Richmond and Clifford, the footing could be revised to cast in a new foundation for the mast arm. The mast arm cannot move. The mast arm would need to be supported during construction.
134.	**There is an electrical line that runs along the sidewalks on Clifford and Friendship. It is unclear what that electric is and what we do with it during the foundation install. Is it meant to remain or to be removed?**	**Electrical lines are to remain unless coordination with NGRID allows otherwise.**
135.	**Last there are existing street lighting and foundations that maybe in conflict with the foundation installation. Please provide clarification on how these units are handled during the construction of the foundations. Do these remain and are part of the final plan or are they removed?**	**Contractor to remove, store, and reset light pole. Light poles damaged by the contractor shall be replace in kind by the contractor.**
136.	**The list of permits that RI Convention Center was going to provide and pay for.**	**See Project Permits List and who is responsible attached to Addendum # 3**
137.	**Agreed upon schedule for all utility work by National Grid and Cox Communications and the required support the GC needs to provide for their work.**	**See N-Grid Schedule attached to Addendum # 2**
138.	**Please clarify the scope of work that is included in the contaminated soil allowance and unit price as it states to include excavate, handle, stockpile, test, transport, and dispose. However in the prebid there was discussion that the unit price was trucking and disposal only.** **Lump Sum Allowances** **Allowance No. 1:** Includes an allowance of $900,000.00 to excavate, handle, stockpile, test, transport and dispose of 13,000 tons of contaminated soil, complete as detailed in Section 026100 – Removal and Disposal of Contaminated Soil to be invoiced based on the unit prices in Section 6. **6. UNIT PRICES** **Unit prices below will be used to track removal identified in allowances. Prices identified are inclusive of all overhead and profit** **Unit Price No. 1:** Removal and Disposal of Contaminated Soil Type A (As detailed in Section 026100). Removal and Disposal of Contaminated Soil. $_____Per Cubic Yard **Unit Price No. 2:** Removal and Disposal of Contaminated Soil Type B (As detailed in Section 026100). Removal and Disposal of Contaminated Soil. $_____Per Cubic Yard	**The contaminated soil allowance and the associated Unit Prices cover excavation, handling, stockpiling, testing, transportation and disposal.**

	QUESTIONS	ANSWERS
	A. Unit Price No. 1: Removal and Disposal of Contaminated Soil Type A 1. Description: Excavate, handle, stockpile, test, transport and dispose contaminated soil complete as detailed in Section 026100 – Removal and Disposal of Contaminated Soil, and as indicated on the Drawings or as directed by the Engineer. This Item relates Lump Sum Allowance No. 6 described in Section 012100. 2. Unit of Measure: Tons of Contaminated Soil Type A Disposed.	
139.	**Specification Section 012300 Alternate No. 2 in lieu of metal studs for the trusses provide aluminum trusses. Can the engineer provide us with a list of companies that are acceptable manufacturers of aluminum trusses?**	**No. Not at this time. A prefabricator of aluminum roof truss framing may be capable of designing and fabricating aluminum trusses to be attached to the precast concrete wall panels.**
140.	**Specification Section 03300, Section 2.2A, requests the contractor include 10 tons of reinforcement bars in the bid to be used at the discretion of the engineer. The unused portion will be returned to the Owner at the unit price stated on the bid form. Please add a unit price section on the bid form.**	**This unit price is to be shown on the bid form.**
141.	**Note #4 on Drawing S-101 states that there is to be a 3" mud slab under the 10" structural CIP slab. Details on S-513 through this are do not detail where this mud slab is located. If it is to be directly under the 10" slab, there will be a conflict with the grade beams running across the slab. Please clarify location/elevation of 3" mud slab.**	**The mud slab is directly underneath the structural CIP slab and is discontinuous at grade beam locations.**
142.	**Specification section, 012100, para 3.3.A, describes a lump sum amount of $900,000.00 for 13,000 tons of contaminated soil. The bid form para 6, Unit prices 1 and 2 request a unit price per cubic yard for Type A and type B contaminated soil. Please coordinate the allowance, presently described in "tons", with the unit price on the bid form, presently described in "cubic yards". Or provide a conversion factor from "cubic yards" to "tons".**	**The Unit Price Items No. 1 and No. 2 shall be provided in Dollars per Ton. Payment will be made in accordance with the weight slips received from the disposal facility.**
143.	**Please include, on the bid form, a unit price to dispose of "clean soil". This will allow the contractor to be paid for the removal of "clean soil" if the contaminated soil is less than the 13,000 tons called out in the allowance.**	**For purposes of this project, all excess site soil is considered "contaminated". As such, excess site soil must be disposed at an appropriate facility.**
144.	**Can sprinkler piping layouts be provided for the Ground level / tier which is designated on drawing "A-001" as being "Enclosed" and needing sprinklers?**	**Sprinkler piping layout for the entire below-grade "enclosed" parking area on the B1 tier are shown on drawing FP-200.**
145.	**Should the future retail area be provided with shell space sprinkler protection? Is so, can a sprinkler piping layout of this area be provided?**	**Mercantile Space 112 is not to have sprinkler protection until the interior tenant fit-up work is to be done.** **Sprinkler in the future mercantile area is not part of this bid.**
146.	**Building Permit** **Section 002113 Instructions to Bidders**	**The fire and building permit applications are in process of being**

	QUESTIONS	ANSWERS
	page 7 **The "Summary of Significant Dates" stipulates award of contract on March 23, 2018 and Substantial Completion on July 31, 2019. To establish the construction start date, could you confirm that a general building permit was issued for the garage project? If not issued, yet, what date is anticipated?** **Note that this question applies to the general building permit; it is understand that other permiting is in place per Appendix H of the Project Manual.**	**reviewed by the State of Rhode island Fire Marshal and Building Officials Offices. It is expected that a permit will be issued by May 1, 2018.**
147.	**3D Model** **Section 0131000 Project Management and Coordination** **Could the current 3D design model be shared with bidders for informational purposes?**	**The 3D design model cannot be provided at this time.** **3 D Model is not available.**
148.	**Missing Drawings** **Section 002113 Instructions to Bidders and Section 000115 List of Drawings** **paragraph 002113-4)c) and pages 1-2 of section 000115** **Regarding the requirement that bidders shall identify discrepancies: the List of Drawings includes two drawings missing from the bid set file. The file name is: Garrahy Courthse Bldg Permit Set.pdf The missing drawings are:** **S-202 BUILDING ELEVATIONS** **S-573 WATERPROOFING & EXPANSION JOINT DETAILS**	**These drawings are intentionally not included in the set.**
149.	**General Note 6 on S100 foundation plan states "Interconnecting Grade Beams and Spread Footings shall be finished in their entirety before precast is erected." Please confirm that the grade beams will be able to with stand the crane loading for erection. The slab is part of the grade beams. Does the slab need to be in too?**	**Grade beams are not currently designed for crane loads. Erection sequencing and crane locations must be coordinated with engineer. Some grade beam or foundations may be able to be placed while erection is ongoing to facilitate crane movement throughout the site.**
150.	**Foundation Information Notes 2 and 4 on S100 conflict with one another. Does the footings sit on 2 foot of crushed stone or directly on the naturally deposited soil improved soil.** **Note 2: All Foundations shall consist of spread footings or strip footings bearing on naturally deposited soil improved by use of rigid inclusion geopiers.** **Note 4: spread Footings & Strip Footings shall be installed on a 2-foot thick crushed stone or concrete pad over rigid inclusion geopiers.**	**Replace notes 2 and 4 with: All building shallow footing foundations shall bear on Engineer approved ground improvement systems.** **There are currently several types of proprietary ground improvement systems that may be suitable for project use, the type and constituent components of each type will vary. See Specification Section 316613 for additional information.**
151.	**Please clarify if the $0.06/sf/week City of Providence right of way occupancy permit for the use of the sidewalks/streets closed off to the public will be carried by the owner or if this is by the contractor.**	**This fee is to be carried by the contractor.**

	QUESTIONS	ANSWERS
152.	**Please provide the column and grid locations of the shear walls and the length of the of the shear walls at those locations.**	**There are 30' shear wall located at B/2, B/4, B/8, C/2, C/4 and C/8. Light walls approximately 48' in length are found between B/3 and B/7 and between C/3 and C7. There are also lateral load resisting walls at the stair tower. The main lateral load resisting walls are labeled as W1, W2, W3 and W4 on 2/S-422. Lastly, there is a concrete moment frame at the stair tower located along line D. See 1/S-442.**
153.	**Is the large mat at grid line 8 and column lines C to D part of the lateral restraint system? If so, which walls are part of the lateral restraint system?**	**Yes, the mat serves as the foundation for the shear wall at C/8 as well as the lateral load resisting members of the stair tower.**
154.	**Is a Unistress output available to provide column and wall service loads as well as the moments at the shear wall locations? Can this be provided?**	**The precaster for the project has yet to be selected but all footings have been sized by Walker with Walker's own analysis with a gross allowable bearing pressure of 8000 psf and that criteria is expected to be met.**

Traffic Impact and Access Study

Garrahy Judicial Complex Parking Garage

Providence, Rhode Island

Prepared for **Walker Parking Consultants**
20 Park Plaza, Suite 1202
Boston, Massachusetts 02116

Prepared by ***VHB***
1 Cedar Street, Suite 400
Providence, Rhode Island 02903

January 2016

Memorandum

To: Mr. Arthur G. Stadig, PE
Vice President
Walker Parking Consultants
20 Park Plaza, Suite 1202
Boston, Massachusetts 02116

Date: January 6, 2016

Project #: 72739.00

From: Robert J. Clinton, PE
Transportation Project Manager

Re: Garrahy Parking Garage
Providence, Rhode Island
Traffic Impact Memorandum

Vanasse Hangen Brustlin, Inc. (VHB) has evaluated the potential traffic impacts associated with the proposed construction of a 1,250± space parking garage to be located on the existing surface parking lot serving the Garrahy Courthouse between Friendship Street, Clifford Street, and Richmond Street in Downtown Providence, Rhode Island. The proposed garage has not been fully designed; however, there is a concept plan which has been developed by Walker Parking Consultants which was used to assess the proposed traffic impacts.

This assessment focused on the following three traffic conditions; Existing, 2020 No-Build, and 2020 Build. The first condition (Existing conditions) looks at existing traffic volumes and the ability of the existing roadways and intersections to accommodate the weekday morning and evening traffic. The second condition (2020 No-Build) projects the traffic conditions in the future year 2020 without the construction of the garage and including general background growth. The third condition (2020 Build) projects the traffic conditions in the future year 2020 with the construction of the new parking garage, general background growth and development of the I-195 lands redevelopment district (The LINK) in the immediate vicinity of the proposed parking garage.

This assessment indicates that the construction of the proposed Garrahy Judicial Complex Parking Garage will have some impacts on traffic operations; however, there are measures that can be implemented to mitigate these impacts. Proposed mitigation includes, but is not limited to, signal timing optimizations at the study area intersections as well as measures to control queuing and improve traffic flow. The study area intersections are projected to operate efficiently with the proposed mitigation. The following memorandum summarizes our findings and the recommended mitigation.

DEVELOPMENT PROPOSAL

The proposed Garrahy Parking Garage (the Site) is a 1,250± space parking garage to be located on the existing surface parking lot serving the Garrahy Courthouse between Friendship Street, Clifford Street, and Richmond Street in Downtown Providence. This parking garage will replace the existing 188± space surface parking lot on the site.

This garage is intended to both replace the existing surface parking lots serving the courthouse and support future development in the I-195 lands redevelopment district. In terms of serving the existing courthouse, this garage will allow all courthouse staff to park at the Garrahy Judicial Complex rather than at various off-site locations in Downtown Providence.

The study area for this traffic study includes five signalized intersections within the immediate vicinity of the proposed garage as well as the two proposed parking garage driveways.

1. East Franklin Street (Service Road 8) at Clifford Street
2. Friendship Street at Dorrance Street

1 Cedar Street
Suite 400
Providence, RI 02903-1023
P 401.272.8100

3. Clifford Street at Dorrance Street
4. Friendship Street at Richmond Street
5. Clifford Street at Richmond Street

Figure 1 illustrates the Site location and the five study area intersections.

EXISTING CONDITIONS

The proposed Garrahy Parking Garage is located between Friendship Street, Clifford Street, and Richmond Street in Downtown Providence. Friendship Street and Clifford Street operate as a one-way pair with Friendship Street as the eastbound roadway and Clifford Street as the westbound roadway toward the Service Roads and ultimately I-95 North/South. Richmond Street is a two-way roadway south of Friendship Street and one-way northbound north of Friendship Street. Dorrance Street is a two-way street providing travel north-south between Dyer Street and Francis Street. On-street parking is permitted on Friendship Street, Clifford Street, Richmond Street, and Dorrance Street. The five study area intersections are signalized.

Traffic Volumes

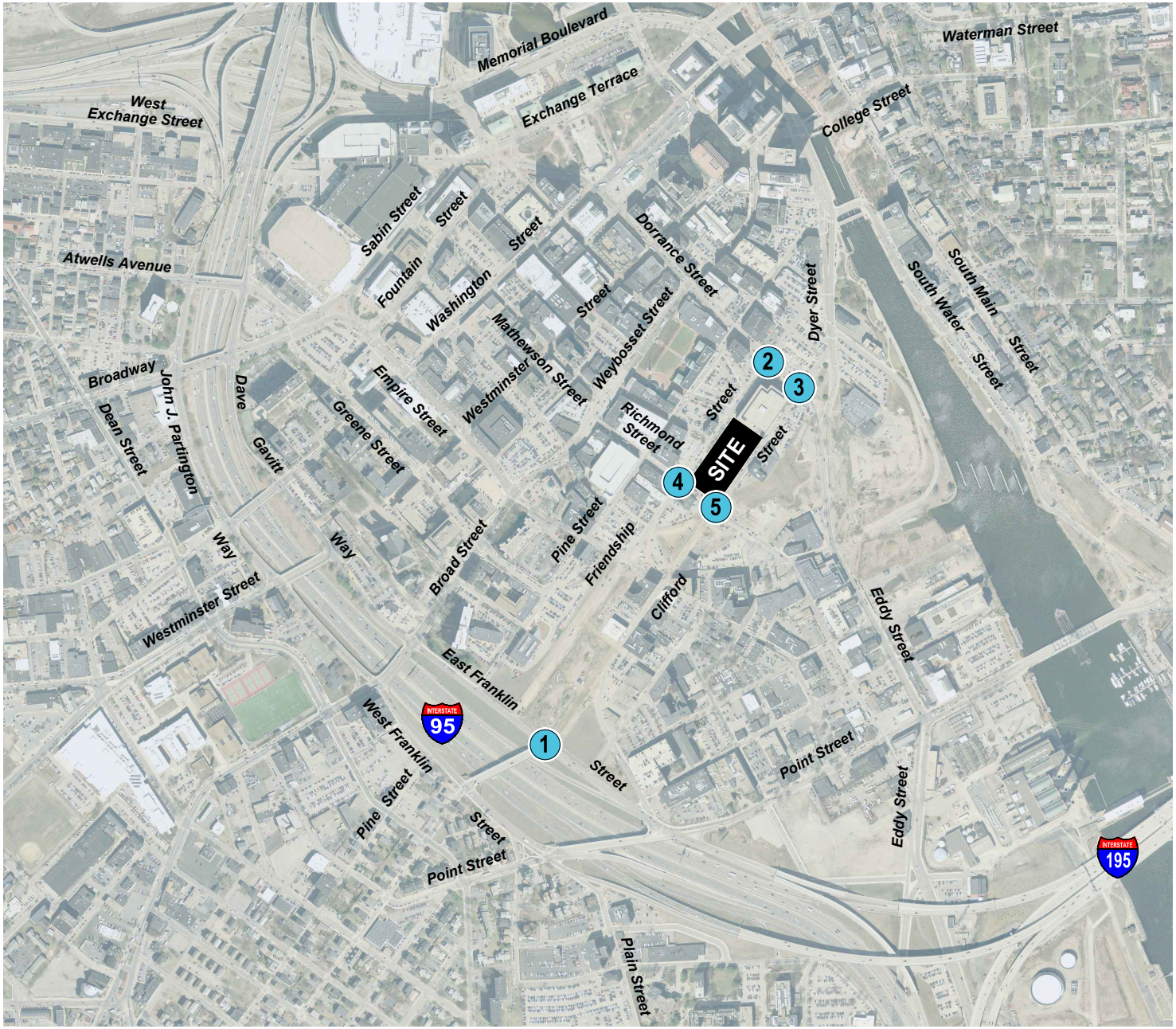
To assess existing traffic conditions of the area roadway network, peak hour turning movement and classification (TMC) counts were conducted at the study area intersections on Tuesday, November 17, 2015 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM, to coincide with the expected peak times of the courthouse and surrounding developments. According to RIDOT 2013 seasonal adjustment factors, November traffic volumes during the weekday are generally higher than those observed during the average month; therefore, in order to be conservative (using higher than average traffic conditions) no seasonal adjustments were applied to the turning movement counts. The 2015 Existing weekday morning and evening peak hour traffic volume networks are summarized in Figure 2.

FUTURE CONDITIONS

Background Traffic Growth

To assess future traffic conditions without the Project (i.e., the 2020No-Build condition), existing traffic volumes were projected to a 5-year planning horizon. These traffic volumes are based on traffic growth likely to be experienced in the area which is driven by the expected land development, economic activity, and changes in population demographics.

A review of historic data published by the Rhode Island Department of Transportation (RIDOT) suggest that daily traffic volumes in the area have generally remained the same or decreased slightly over recent years. However, to provide a conservative analysis and to account for traffic from any currently unknown minor development projects in the area, a 0.5 percent per year background growth rate was utilized for the 2020 No-Build conditions. Although there is notable development potential in the area of the proposed garage, specifically the I-195 LINK Development District, it is assumed that generated trips will be those utilizing the garage under the 2020 Build condition. Construction of the Garrahy Judicial Complex Parking Garage will enable future growth and development in The LINK. The 2020 No-Build weekday morning and evening peak hour traffic volume networks are summarized in Figure 3.



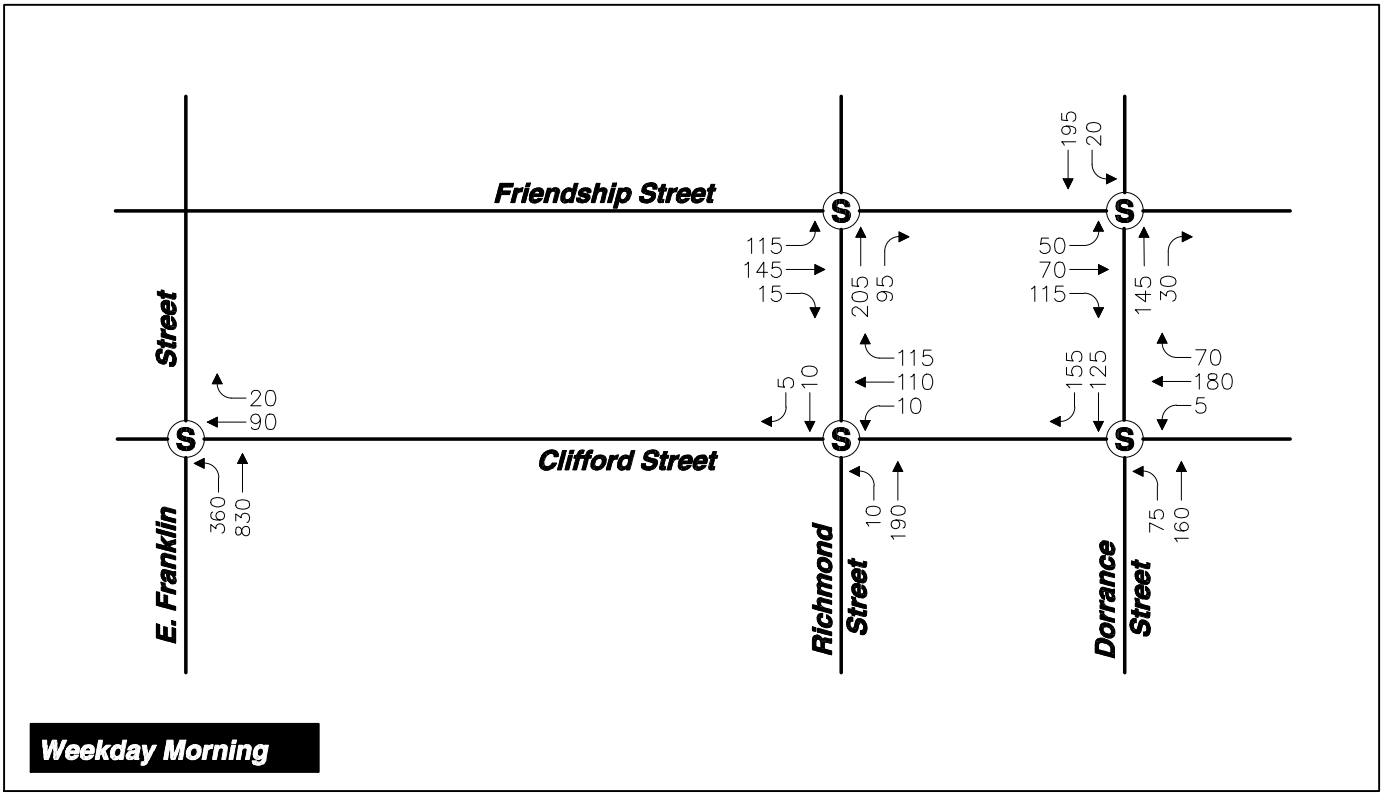
Study Area Intersections

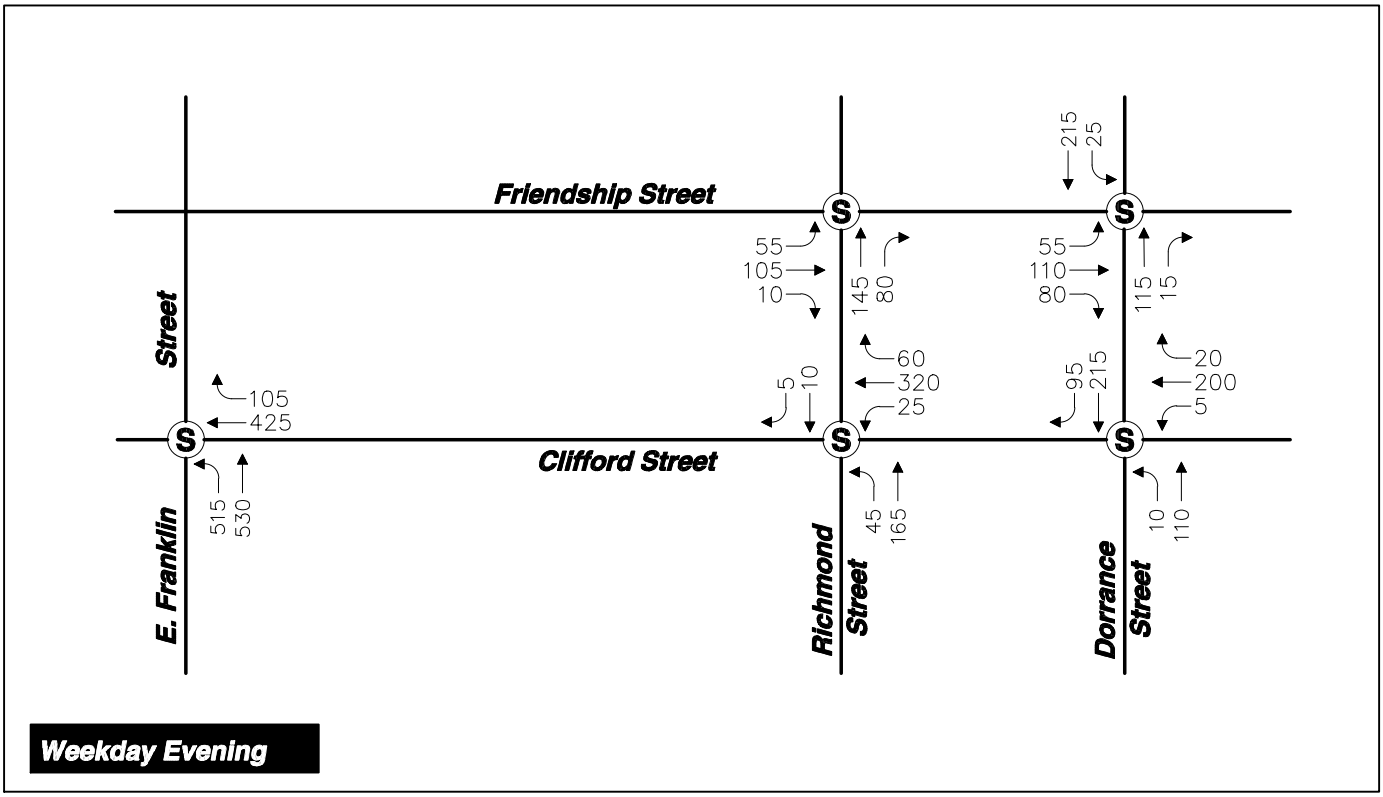
1. E. Franklin Street at Clifford Street
2. Friendship Street at Dorrance Street
3. Clifford Street at Dorrance Street
4. Friendship Street at Richmond Street
5. Clifford Street at Richmond Street

vhb Study Area

Figure 1

0 400 800 Feet





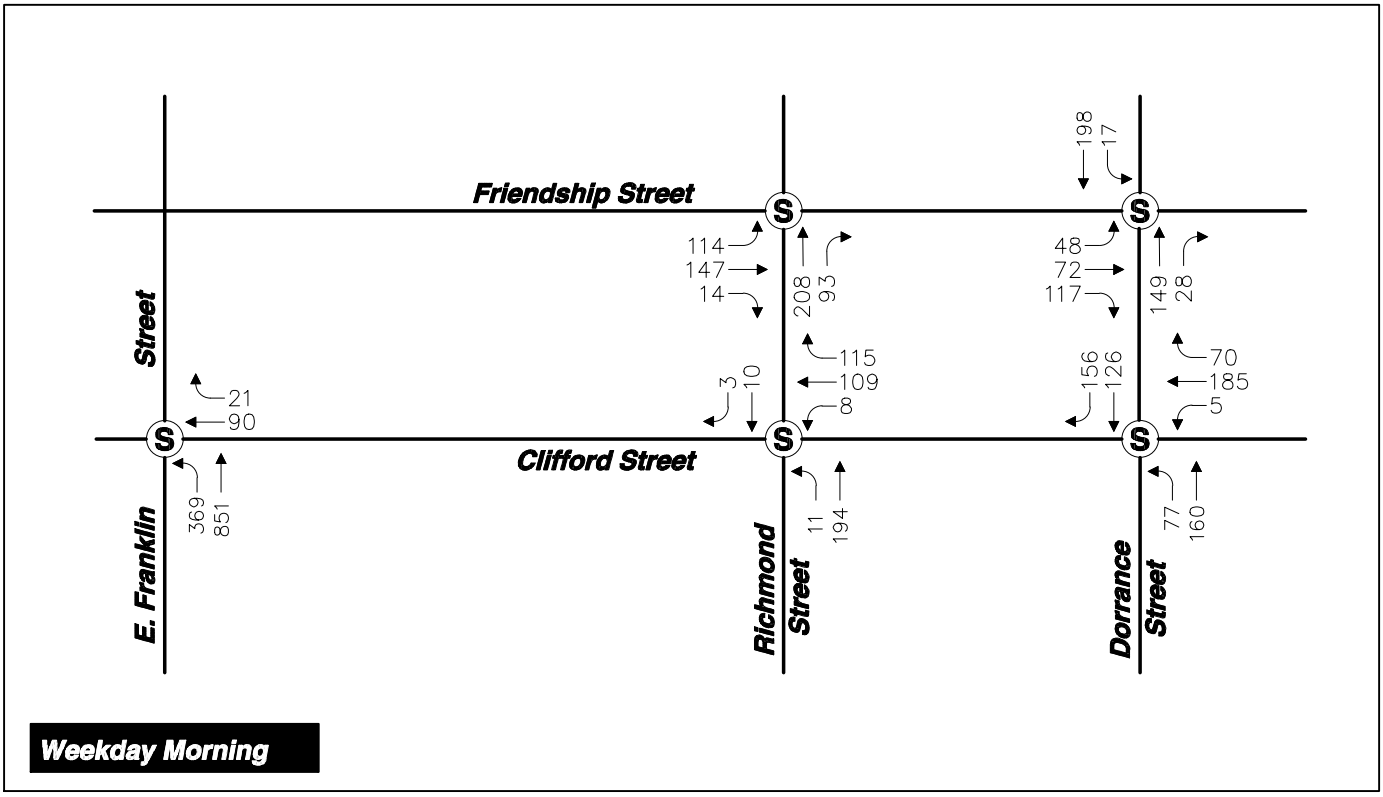
Legend

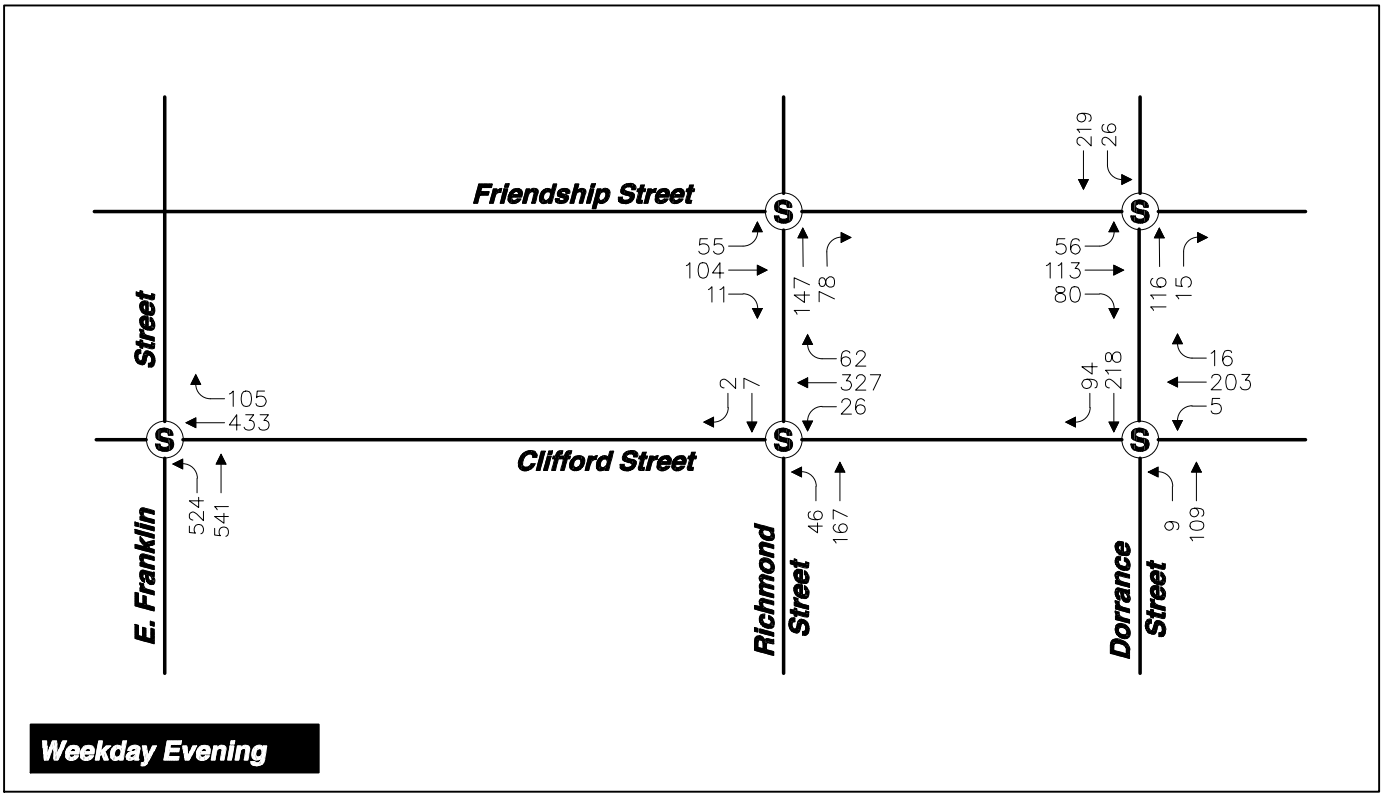
Ⓢ Traffic Signal

2015 Existing Condition
Peak Hour Traffic Volumes

Figure 2

NOT TO SCALE





Legend

Ⓢ Traffic Signal

2020 No Build Condition
Peak Hour Traffic Volumes

Figure 3

NOT TO SCALE

Trip Generation

The Garrahy Judicial Complex Parking Garage itself does not generate vehicle trips, rather it provides parking for trips generated by various developments in Downtown Providence (proposed development of The LINK properties in the immediate vicinity) and specifically for existing courthouse employees and visitors who are currently parking at various locations across Downtown Providence.

The proposed parking structure is assumed to be constructed on the site of an existing surface parking lot that is currently serving the courthouse. Those existing trips entering and exiting the surface parking lot will be re-routed under a build condition and viewed as a credit reducing the number of newly generated trips.

The peak periods when the garage fills and empties is typically viewed as a two hour period in the morning (approximately 7:00 AM to 9:00 AM) and two hour period in the evening (4:00 PM to 6:00 PM) when approximately 60 to 80 percent of the garage capacity enters or exits. On a typical weekday it is therefore assumed that 40 percent of the capacity of the parking garage occupants will enter or exit the garage during the peak hour. Given that the garage has a capacity of 1,250± parking spaces, 500 vehicles are assumed to enter during the morning peak hour and leave during the evening peak hour.

It is assumed that a small number of trips will occur in the opposite direction of the peak directional traffic flow (i.e. exiting the garage in the morning and entering the garage in the evening), if any. Conservatively, it is assumed that five percent of the total capacity of the garage will be traveling in the opposite direction of the peak directional traffic flow during the peak hour. Furthermore, as the existing surface parking lot is for courthouse use only, it is assumed that there are no existing trips in the opposite direction as the peak directional traffic flow and therefore no credits will be taken for existing trips in the network that may be traveling in the opposite direction as the peak hour traffic flow.

Table 1 Trip Generation Summary (Gross Trips Calculation)

	Total Trips Generated	Less Existing Trips	Net New Trips
Weekday Morning			
Enter	500	105	395
Exit	63	0	63
Total	563	105	458
Weekday Evening			
Enter	63	0	63
Exit	500	105	395
Total	563	105	458

As shown in Table 1, the Project is projected to generate approximately 458 gross vehicles per hour (vph) (395 entering and 63 exiting) during the morning peak hour and 458 vph (63 entering and 395 exiting) during the evening peak hour.

Trip Distribution

Almost all of the trips traveling to and from the garage are likely traveling to or from residences outside of the City of Providence to jobs within Downtown Providence. For this reason, U.S. Census Journey to Work 2010 data was used to distribute trips along major routes through the City of Providence. It is assumed that five percent of the trips will be generated within the City of Providence. Figure 4 shows the regional trip distribution.

Build Traffic Volumes

Site-generated new traffic was added to the 2020 No-Build peak hour traffic volumes and to develop the 2020 Build weekday morning and weekday evening peak hour traffic volumes. Figure 5 illustrates the immediate vehicle access to the proposed parking garage. Figure 6 shows the resulting 2020 Build Condition traffic volumes.

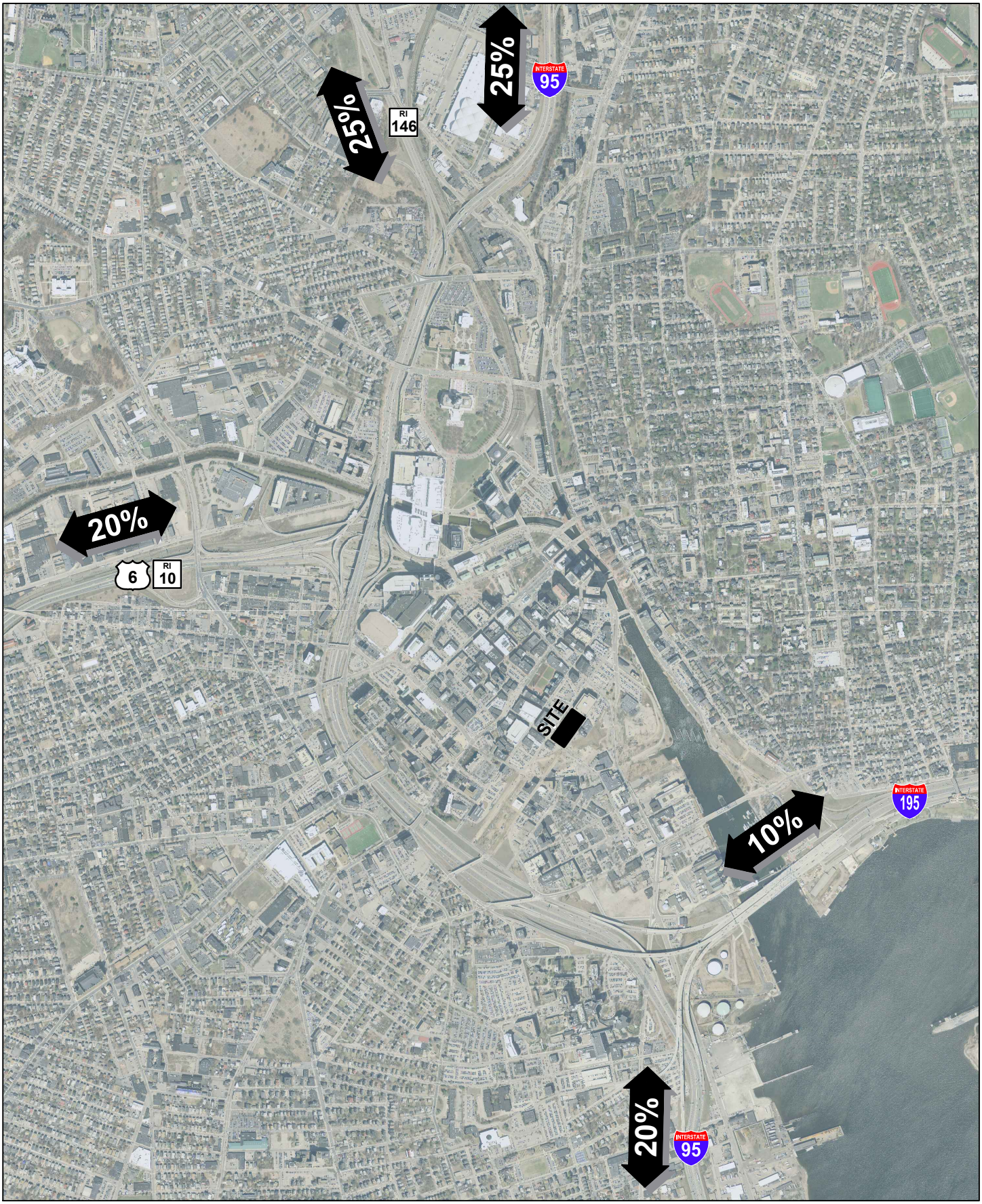
TRAFFIC OPERATIONS

VHB has prepared the following section of this memorandum to describe the quality of the traffic flow at the study intersections given the existing and projected travel demands. As a basis for this assessment, capacity analyses were conducted for the signalized and unsignalized study area intersections under existing, no-build, and future build conditions. The analyses provide an indication of how well the roadway currently serves traffic demands and quantifies the impacts associated with projected new traffic generated by the proposed garage. The capacity analyses were conducted using procedures contained in the 2000 Highway Capacity Manual[2]. A discussion of the evaluation criteria and summary of the results of the signalized and unsignalized analyses is presented below.

Level of Service (LOS) is a term used to describe the different operating conditions that occur on a given roadway or intersection under various traffic volume loads. It is a qualitative measure of the effect of a number of factors including roadway geometrics, travel delay, and freedom to maneuver. Six levels of service are defined for each type of facility. Levels of service are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F representing the worst.

The level of service designation is reported differently for signalized and unsignalized intersections. For signalized intersections, the analysis considers the operation of all traffic entering the intersection and the level of service designation represents the overall traffic operating conditions at the intersection. For unsignalized intersections, the analysis assumes that traffic on the mainline is not affected by traffic on side streets. The LOS is only determined for left-turns from the main street and all movements from the minor street.

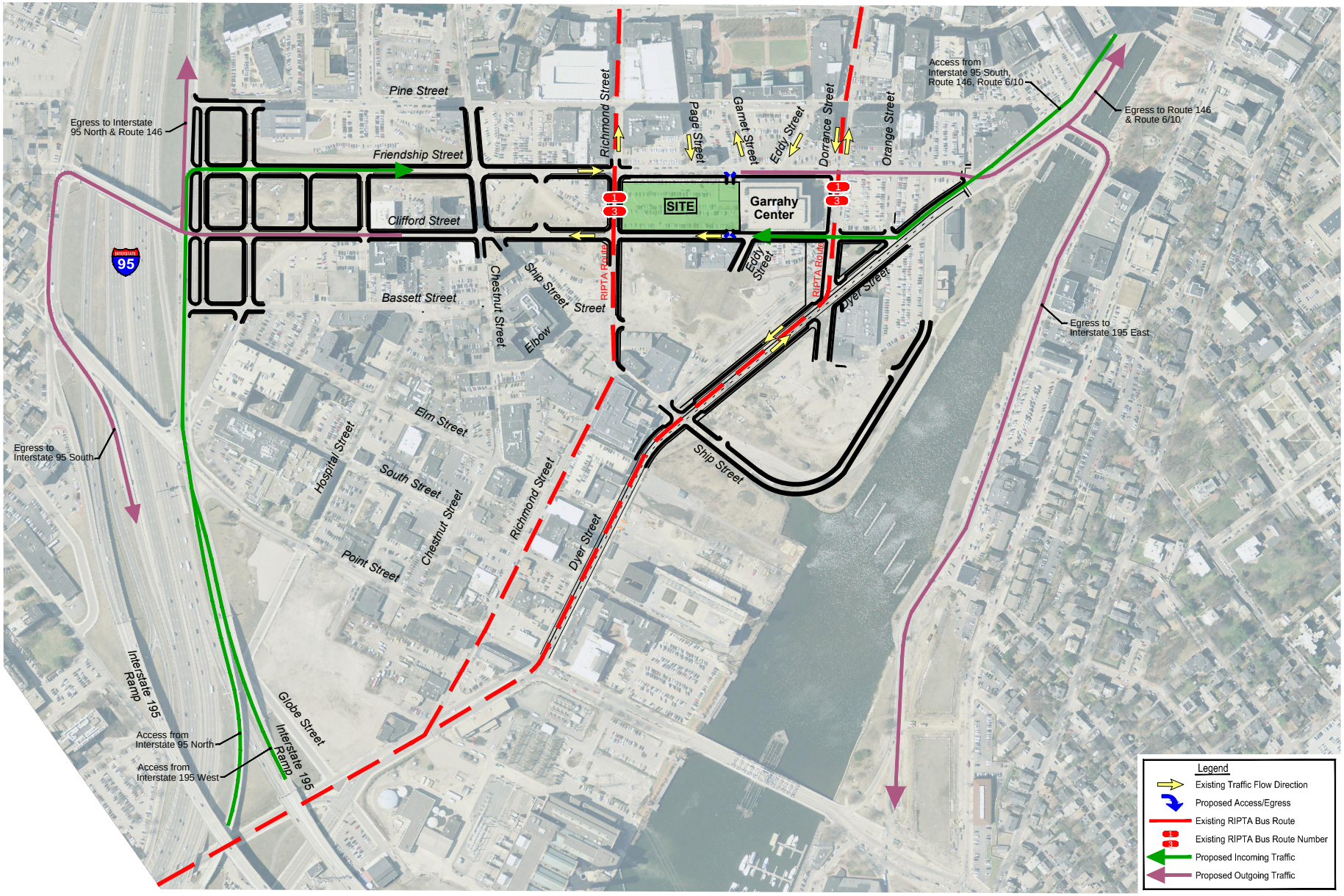
2 Highway Capacity Manual; Transportation Research Board, Washington, D.C. (2000).



Vehicular Trip Distribution

Figure 4

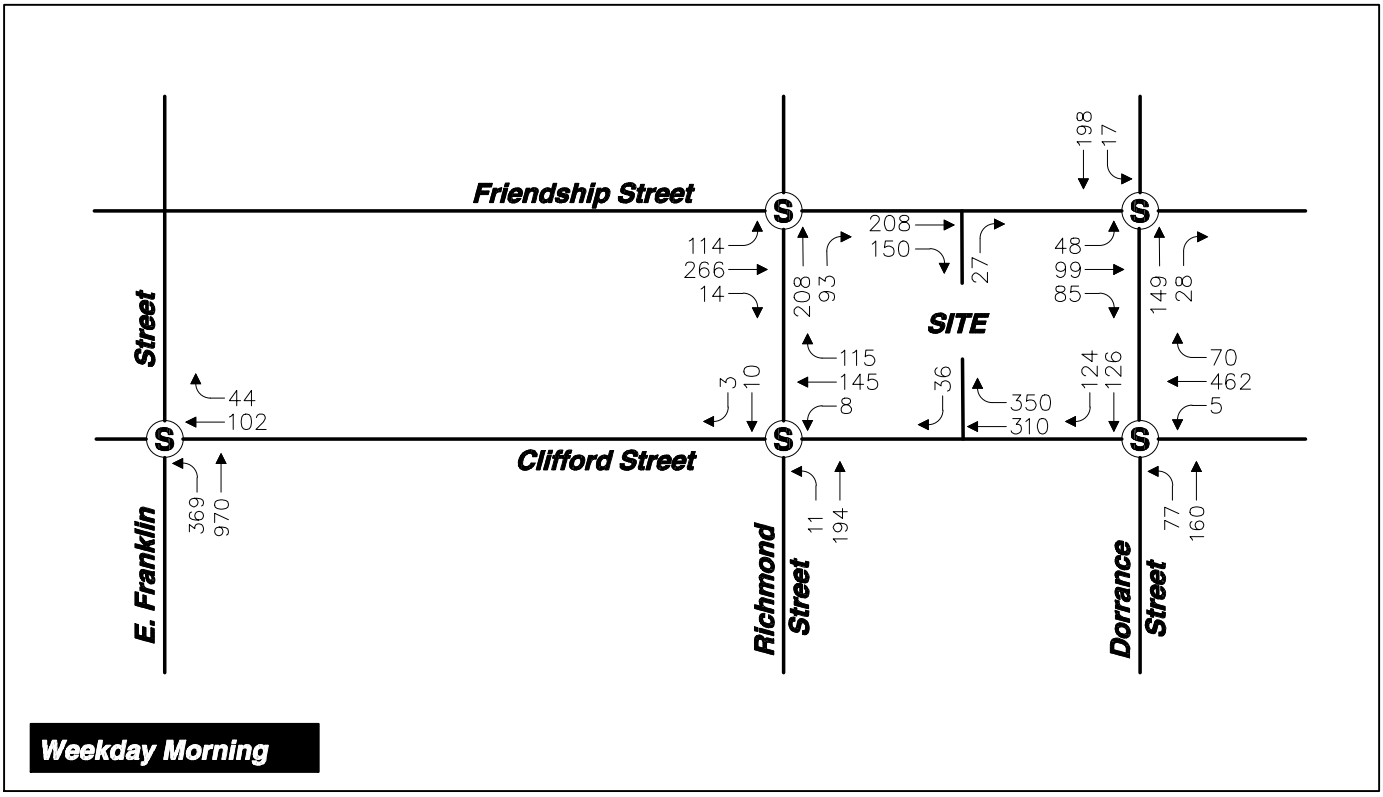
0 750 1500 Feet

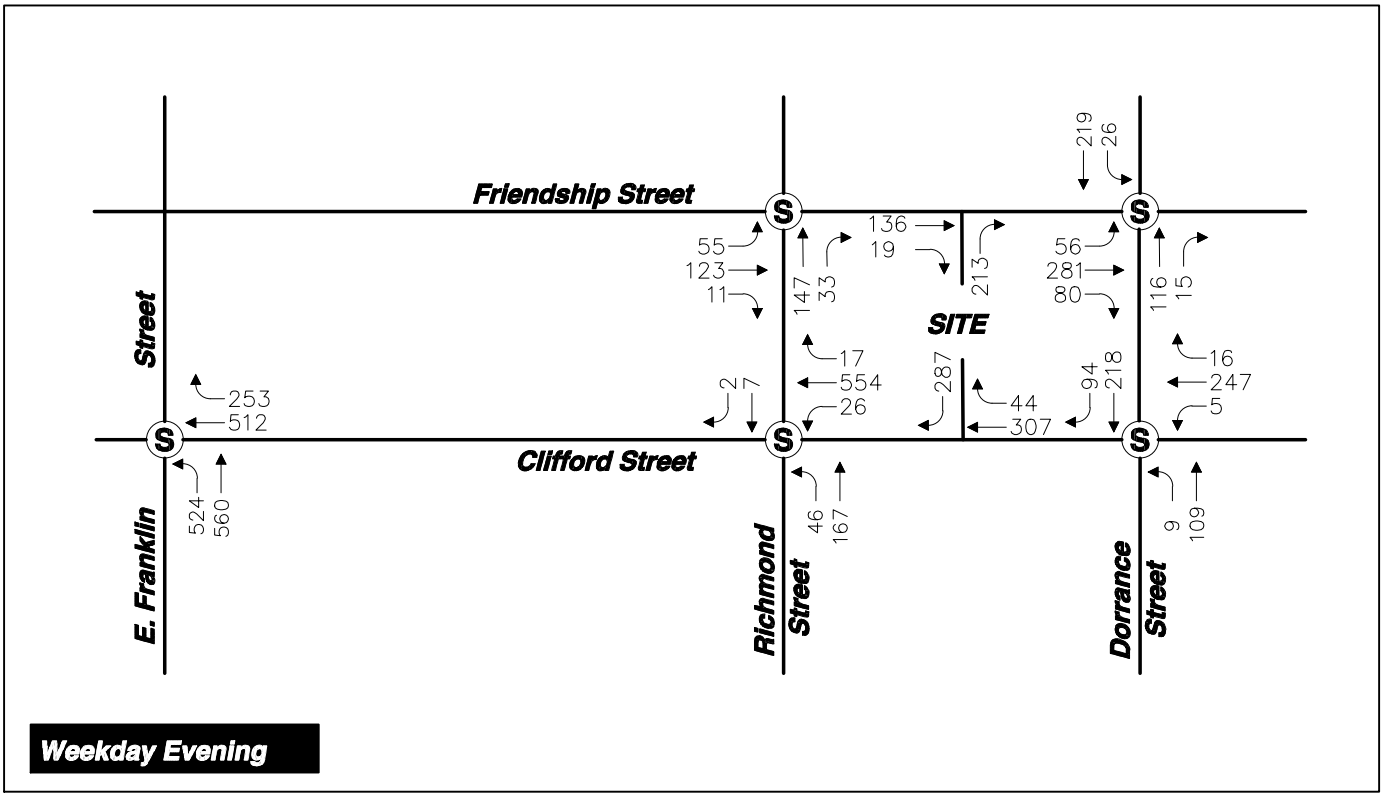


New Trip Routes

Figure 5

0 250 500 Feet





Legend

Ⓢ Traffic Signal

2020 Build Condition
Peak Hour Traffic Volumes

Figure 6

NOT TO SCALE

Signalized Intersection Capacity Analysis

Capacity analyses were conducted for the signalized intersections under the Existing, 2020 No-Build, and 2020 Build conditions. It is important to note that the analysis procedures do not account for delays caused by on street parking and pedestrians that do not walk with the pedestrian phases at the intersection; therefore actual delays and queues in the field may be longer than those calculated. In general, based on the capacity analysis, all signalized study area intersections currently operate efficiently (LOS C or better) during the morning and evening peak hours with manageable queues and delays. It is projected that with the projected traffic entering/exiting the proposed parking garage the intersections will operate at acceptable levels of service with manageable increases in delays and queues. The results of the signalized intersection capacity analyses are summarized in Table 2.

Table 2 Signalized Intersection Capacity Analysis Summary

		Existing			2020 No-Build4			2020 Build		
Location	**Period**	**V/C[1]**	**Delay[2]**	**LOS[3]**	**V/C[1]**	**Delay[2]**	**LOS[3]**	**V/C[1]**	**Delay[2]**	**LOS[3]**
1. East Franklin Street at Clifford Street	AM Peak	0.33	5.2	A	0.34	5.2	A	0.39	5.8	A
	PM Peak	0.59	21.8	C	0.60	22.9	C	0.69	23.3	C
2. Friendship Street at Dorrance Street	AM Peak	0.42	6.5	A	0.40	6.4	A	0.42	6.5	A
	PM Peak	0.45	7.3	A	0.47	7.4	A	0.62	9.1	A
3. Clifford Street at Dorrance Street	AM Peak	0.49	7.9	A	0.49	8.0	A	0.70	12.5	B
	PM Peak	0.45	7.4	A	0.45	7.5	A	0.48	7.7	A
4. Friendship Street at Richmond Street	AM Peak	0.33	6.7	A	0.33	6.8	A	0.38	6.8	A
	PM Peak	0.31	7.0	A	0.31	7.0	A	0.28	7.0	A
5. Clifford Street at Richmond Street	AM Peak	0.26	6.6	A	0.27	6.6	A	0.29	6.5	A
	PM Peak	0.43	7.0	A	0.45	6.9	A	0.53	7.6	A

Source: Synchro 7 software using the procedures in the 2000 Highway Capacity Manual. Compiled by VHB.
1 V/C = volume-to-capacity ratio
2 Delay = Average delay in seconds per vehicle
3 LOS = Level of Service

<u>East Franklin Street (Service Road 8) at Clifford Street</u>

As shown in Table 2, the capacity analyses indicate that the intersection of East Franklin Street (Service Road 8) at Clifford Street currently operates at LOS A during the weekday morning peak hour period and LOS C during the evening peak hour period. The intersection is projected to continue to operate at LOS A during the weekday morning peak hour period and LOS C during the evening peak hour period. With the projected traffic entering/exiting the proposed parking garage the intersection is projected to continue to operate at LOS A during the weekday morning

peak hour period and LOS C during the evening peak hour period with optimized signal timings. There will be some minor increases in delays and queues however they will be manageable with optimized traffic signal timings.

Friendship Street at Dorrance Street

As shown in Table 2, the capacity analyses indicate that the intersection of Friendship Street at Dorrance Street currently operates at LOS A during the weekday morning and evening peak hour periods. The intersection is projected to continue to operate at LOS A during the weekday morning and evening peak hour periods under 2020 No-Build conditions. With the projected traffic entering/exiting the proposed parking garage the intersection is projected to continue to operate at LOS A.

Clifford Street at Dorrance Street

As shown in Table 2, the capacity analyses indicates that the intersection of Clifford Street at Dorrance Street currently operates at LOS A during the weekday morning and evening peak hour periods. The intersection is projected to continue to operate at LOS A during the weekday morning and evening peak hour periods under 2020 No-Build conditions. With the projected traffic entering/exiting the proposed parking garage the intersection is projected to operate at LOS B during the weekday morning peak hour and LOS A during the evening peak hour period.

Friendship Street at Richmond Street

As shown in Table 2, the capacity analyses indicate that the intersection of Friendship Street at Richmond Street currently operates at LOS A during the weekday morning and evening peak hour periods. The intersection is projected to continue to operate at LOS A during the weekday morning and evening peak hour periods under 2020 No-Build conditions. With the projected traffic entering/exiting the proposed parking garage the intersection is projected to continue to operate at LOS A.

Clifford Street at Richmond Street

As shown in Table 2, the capacity analyses indicate that the intersection of Clifford Street at Friendship Street currently operates at LOS A during the weekday morning and evening peak hour periods. The intersection is projected to continue to operate at LOS A during the weekday morning and evening peak hour periods under 2020 No-Build conditions. With the projected traffic entering/exiting the proposed parking garage the intersection is projected to continue to operate at LOS A.

Unsignalized Intersection Capacity Analysis

The results of the unsignalized intersection capacity analyses for the unsignalized intersections within the study area are summarized in Table 3.

Table 3 Unsignalized Intersection Capacity Analysis Summary

Location	Period	Critical Movement[1]	2020 Build		
			Demand	Delay	LOS
Proposed Garage North Driveway at Friendship Street	AM Peak	NB R	27	9.9	A
	PM Peak	NB R	213	10.5	B
Proposed Garage South Driveway at Clifford Street	AM Peak	SB R	36	11.0	B
	PM Peak	SB R	287	12.1	B

Source: Synchro 8 software using the procedures in the 2000 Highway Capacity Manual. Compiled by VHB.

1 L = Left-turn movement, T = Through movement, R = Right-turn movement, NB= Northbound; SB = Southbound, EB = Eastbound; WB= Westbound

2 Demand = Demand of critical movement, expressed in vehicles per hour

3 Delay = Vehicle delay expressed in seconds per vehicle

4 LOS = Level of Service

Proposed Garage North Driveway at Friendship Street

The Proposed Garage North Driveway right-turn exit onto Friendship Street is projected to operate at LOS B as shown in Table 3. The projected 95th percentile queues during the weekday evening peak hour are projected to be less than two vehicles. Based on the concept plan it appears that these queues can be managed inside the garage provided that the garage and gates are designed efficiently.

Proposed Garage South Driveway at Clifford Street

The Proposed Garage North Driveway right-turn exit onto Clifford Street is projected to operate at LOS B as shown in Table 3. The projected 95th percentile queues during the weekday evening peak hour are projected to be less than two vehicles. Based on the concept plan it appears that these queues can be managed inside the garage provided that the garage and gates are designed efficiently.

MITIGATION AND DESIGN CONSIDERATIONS

Mitigation

It is recommended that traffic conditions be monitored as the garage is constructed and The LINK properties are developed. Based on the increase in traffic and changes in traffic patterns resulting from new developments in the study area the traffic signal timings should be optimized periodically to improve traffic operations. It is also recommended that on-street parking be eliminated on the approaches to the intersections when traffic conditions warrant so that additional lanes can be added to increase capacity at the intersections.

Design Considerations

As previously stated, the proposed garage has not been fully designed; however, there is a concept plan which has been developed by Walker Parking Consultants which was used to assess the proposed traffic impacts. It is important that the following issues be considered and addressed during the final design of the proposed parking garage to minimize the impacts that the garage will have on traffic conditions at study area roadways and intersections.

Access/Egress to the Proposed Garage

It is recommended that the proposed garage have entrance/exit driveways on both Friendship Street and Clifford Street in order to provide easy right-turn access into and out of the garage from the east and west. In order to avoid congestion on the adjacent roadways and intersections it is important to provide adequate stacking at the entrances and exits to/from the garage. The driveways should therefore be located midway between Richmond Street and Dorrance Street to avoid the queues from backing up through the adjacent intersections. On-street parking should be eliminated on the approaches to the proposed garage driveways in order to provide additional storage for queued vehicles entering the garage. In the future when traffic volumes along the adjacent roadways increase (beyond the design year projected in this study) it may be desirable to eliminate on-street parking along the departure from the garage and provide an exclusive lane along Friendship Street and/or Clifford Street for vehicles to make free right turns exiting the garage.

It is also desirable to provide adequate storage inside of the garage so that the queues do not impact traffic flow along the adjacent streets. It is desirable to utilize a portion of the first floor of the garage as internal stacking for inbound/outbound traffic.

Pedestrian Accommodations

There will be a significant amount of pedestrian traffic in the study area as a result of the construction of the proposed garage (including ground floor retail) and adjacent developments; therefore, during the development of the final plans, it is important to design the parking garage with the elevator/stair towers located to minimize the number of pedestrians crossing the garage driveways. The pedestrian routes to/from the entrances of the courthouse and the adjacent developments should be considered during the final design of the garage and other developments. From a traffic perspective it would be desirable to have direct pedestrian access from the garage to the courthouse; however, from a security standpoint this may not be feasible.

Drop-off Areas

It is important to design and enforce drop-off areas at the courthouse as well as at the surrounding developments. If drop-off areas are not provided or not designed/enforced properly there will be traffic impacts that will increase congestion. The elimination of on-street parking should be considered in order to accommodate drop-off areas.

Transit

There have been preliminary discussions about the potential relocation some of the RIPTA bus stops from Kennedy Plaza to the area adjacent to the proposed Garrahy Judicial Complex Parking Garage. The plans have not been finalized to identify the number and location of the relocated bus berths at this time. It is recommended that any

plans to relocate transit be coordinated with the design of the proposed parking garage and the surrounding LINK developments.

It is important to provide convenient transit facilities to service the Garrahy Judicial Complex and The LINK developments; however, the number of bus stops and locations need to be well thought out, analyzed and designed so as not to impede the flow of traffic into and out of the proposed garage. It is also important to develop the bus routes to ensure that bus turning movements can be accommodated without impacting traffic on the study area roadways. Another factor is the additional pedestrian activity associated with the relocation of the busses. Pedestrian routes from the bus berths to the courthouse, surrounding developments and other bus berths, would need to be designed to minimize impacts to the operations of the garage access/egress. The elimination of on-street parking would likely be necessary to accommodate bus berths. As the project moves forward, additional discussions and meetings with RIPTA/RIDOT to develop a plan that does not impede the flow of traffic to and from the garage will be required.

CONCLUSIONS

The preceding assessment conducted by VHB indicates that the construction of the proposed 1,250± space Garrahy Parking Garage will have some impacts on traffic operations; however, there are measures that can be implemented to mitigate these impacts. Proposed mitigation includes, but is not limited to, signal timing optimizations at the study area intersections as well as measures to control queuing and improve traffic flow. The study area intersections are projected to operate efficiently with the proposed mitigation.

The proposed garage has not been fully designed. It is important that the following issues be considered and addressed during the final design of the proposed parking garage to minimize the impacts that the garage will have on traffic conditions at study area roadways and intersections:

- Access/Egress to the Proposed Garage:
  - Provide entrance/exit driveways on both Friendship Street and Clifford Street.
  - Provide adequate stacking at the entrances and exits to/from the garage.
  - Locate garage driveways midway between Richmond Street and Dorrance Street to avoid the queues from backing up through the adjacent intersections.
  - Eliminate on-street parking on the approaches to the proposed garage driveways to provide additional storage for queued vehicles entering the garage.
  - In the future consider eliminating on-street parking along the departure from the garage and provide an exclusive lane along Friendship Street and/or Clifford Street for vehicles to make free right turns exiting the garage.
  - Provide adequate storage inside of the garage (utilizing a portion of the first floor of the garage) for inbound/outbound traffic so that the queues do not impact traffic flow along the adjacent streets and within the garage.

- Pedestrian Accommodations:
  - Locate the elevator/stair towers to minimize the number of pedestrians crossing the garage driveways.
  - Consider the routes between the proposed garage and the entrances of the courthouse and the adjacent developments.
  - From a traffic perspective it would be desirable to have direct pedestrian access from the garage to the courthouse; however, from a security standpoint this may not be feasible.
- Drop-off Areas:
  - Eliminate on-street parking in order to accommodate drop-off areas.
  - Design and enforce drop-off areas at the courthouse as well as at the surrounding developments.
- Transit:

  It is important to provide convenient transit facilities to service the Garrahy Judicial Complex and The LINK developments. Plans have not been finalized to identify the number and location of the relocated bus berths at this time; therefore, the following is recommended:
  - Any plans to relocate transit into the study area should be coordinated with the design of the proposed parking garage and the surrounding LINK developments.
  - The number of stops and locations need to be well thought out, analyzed and designed so as not to impede the flow of traffic into and out of the garage.
  - Bus routes should be developed to ensure that bus turning movements can be accommodated without impacting traffic on the study area roadways (this may require curb modifications at intersections or relocation of proposed bus routes).
  - Transit stops should be designed and located considering pedestrian routes to connecting busses as well as access to the courthouse and surrounding developments to minimize vehicular conflicts and impacts to traffic operations.
  - Elimination of on-street parking will likely be necessary to accommodate bus berths.
  - As the project moves forward additional discussions and meetings with RIPTA/RIDOT to develop a plan that does not impede the flow of traffic to and from the garage will be required.

Appendices

- Turning Movement Counts
- Capacity Analysis

■

Turning Movement Counts

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City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 A
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	1	12	0	0	1	5	4	0	0	14	1	0	38
07:15 AM	0	0	0	0	0	12	0	0	1	7	2	0	0	22	1	0	45
07:30 AM	0	0	0	0	2	16	0	0	10	7	3	0	0	21	1	0	60
07:45 AM	0	0	0	0	1	25	0	0	11	13	2	0	0	27	4	0	83
Total	0	0	0	0	4	65	0	0	23	32	11	0	0	84	7	0	226
08:00 AM	0	0	0	0	0	26	1	0	17	18	4	0	0	32	1	0	99
08:15 AM	0	0	0	0	3	38	0	0	28	14	14	0	0	50	3	0	150
08:30 AM	0	0	0	0	10	30	0	0	34	21	14	0	0	58	6	0	173
08:45 AM	0	0	0	0	14	51	0	0	35	17	15	0	0	53	7	0	192
Total	0	0	0	0	27	145	1	0	114	70	47	0	0	193	17	0	614
Grand Total	0	0	0	0	31	210	1	0	137	102	58	0	0	277	24	0	840
Apprch %	0	0	0	0	12.8	86.8	0.4	0	46.1	34.3	19.5	0	0	92	8	0	
Total %	0	0	0	0	3.7	25	0.1	0	16.3	12.1	6.9	0	0	33	2.9	0	
Cars	0	0	0	0	31	200	1	0	136	100	56	0	0	239	23	0	786
% Cars	0	0	0	0	100	95.2	100	0	99.3	98	96.6	0	0	86.3	95.8	0	93.6
Heavy Vehicles	0	0	0	0	0	10	0	0	1	2	2	0	0	38	1	0	54
% Heavy Vehicles	0	0	0	0	0	4.8	0	0	0.7	2	3.4	0	0	13.7	4.2	0	6.4

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	26	**1**	0	27	17	18	4	0	39	0	32	1	0	33	99
08:15 AM	0	0	0	0	0	3	38	0	0	41	28	14	14	0	56	0	50	3	0	53	150
08:30 AM	0	0	0	0	0	10	30	0	0	40	34	**21**	14	0	**69**	0	**58**	6	0	**64**	173
08:45 AM	0	0	0	0	0	**14**	**51**	0	0	**65**	**35**	17	**15**	0	67	0	53	**7**	0	60	**192**
Total Volume	0	0	0	0	0	27	145	1	0	173	114	70	47	0	231	0	193	17	0	210	614
% App. Total	0	0	0	0		15.6	83.8	0.6	0		49.4	30.3	20.3	0		0	91.9	8.1	0		
PHF	.000	.000	.000	.000	.000	.482	.711	.250	.000	.665	.814	.833	.783	.000	.837	.000	.832	.607	.000	.820	.799
Cars	0	0	0	0	0	27	140	1	0	168	113	68	46	0	227	0	173	16	0	189	584
% Cars	0	0	0	0	0	100	96.6	100	0	97.1	99.1	97.1	97.9	0	98.3	0	89.6	94.1	0	90.0	95.1
Heavy Vehicles	0	0	0	0	0	0	5	0	0	5	1	2	1	0	4	0	20	1	0	21	30
% Heavy Vehicles	0	0	0	0	0	0	3.4	0	0	2.9	0.9	2.9	2.1	0	1.7	0	10.4	5.9	0	10.0	4.9

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Groups Printed- Cars

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	1	9	0	0	1	5	3	0	0	9	1	0	29
07:15 AM	0	0	0	0	0	11	0	0	1	7	2	0	0	19	1	0	41
07:30 AM	0	0	0	0	2	16	0	0	10	7	3	0	0	16	1	0	55
07:45 AM	0	0	0	0	1	24	0	0	11	13	2	0	0	22	4	0	77
Total	0	0	0	0	4	60	0	0	23	32	10	0	0	66	7	0	202
08:00 AM	0	0	0	0	0	25	1	0	17	17	4	0	0	28	1	0	93
08:15 AM	0	0	0	0	3	37	0	0	28	14	13	0	0	42	3	0	140
08:30 AM	0	0	0	0	10	29	0	0	34	21	14	0	0	53	6	0	167
08:45 AM	0	0	0	0	14	49	0	0	34	16	15	0	0	50	6	0	184
Total	0	0	0	0	27	140	1	0	113	68	46	0	0	173	16	0	584
Grand Total	0	0	0	0	31	200	1	0	136	100	56	0	0	239	23	0	786
Apprch %	0	0	0	0	13.4	86.2	0.4	0	46.6	34.2	19.2	0	0	91.2	8.8	0	
Total %	0	0	0	0	3.9	25.4	0.1	0	17.3	12.7	7.1	0	0	30.4	2.9	0	

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	25	**1**	0	26	17	17	4	0	38	0	28	1	0	29	93
08:15 AM	0	0	0	0	0	3	37	0	0	40	28	14	13	0	55	0	42	3	0	45	140
08:30 AM	0	0	0	0	0	10	29	0	0	39	**34**	**21**	14	0	**69**	0	**53**	**6**	0	**59**	167
08:45 AM	0	0	0	0	0	**14**	**49**	0	0	**63**	34	16	**15**	0	65	0	50	6	0	56	**184**
Total Volume	0	0	0	0	0	27	140	1	0	168	113	68	46	0	227	0	173	16	0	189	584
% App. Total	0	0	0	0		16.1	83.3	0.6	0		49.8	30	20.3	0		0	91.5	8.5	0		
PHF	.000	.000	.000	.000	.000	.482	.714	.250	.000	.667	.831	.810	.767	.000	.822	.000	.816	.667	.000	.801	.793

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Page No : 1

Groups Printed- Heavy Vehicles

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	0	3	0	0	0	0	1	0	0	5	0	0	9
07:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	4
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
07:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	6
Total	0	0	0	0	0	5	0	0	0	0	1	0	0	18	0	0	24
08:00 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	4	0	0	6
08:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	8	0	0	10
08:30 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	5	0	0	6
08:45 AM	0	0	0	0	0	2	0	0	1	1	0	0	0	3	1	0	8
Total	0	0	0	0	0	5	0	0	1	2	1	0	0	20	1	0	30
Grand Total	0	0	0	0	0	10	0	0	1	2	2	0	0	38	1	0	54
Apprch %	0	0	0	0	0	100	0	0	20	40	40	0	0	97.4	2.6	0	
Total %	0	0	0	0	0	18.5	0	0	1.9	3.7	3.7	0	0	70.4	1.9	0	

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	**1**	0	0	1	0	4	0	0	4	6
08:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	**1**	0	1	0	**8**	0	0	**8**	**10**
08:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	5	0	0	5	6
08:45 AM	0	0	0	0	0	0	**2**	0	0	**2**	**1**	1	0	0	**2**	0	3	**1**	0	4	8
Total Volume	0	0	0	0	0	0	5	0	0	5	1	2	1	0	4	0	20	1	0	21	30
% App. Total	0	0	0	0		0	100	0	0		25	50	25	0		0	95.2	4.8	0		
PHF	.000	.000	.000	.000	.000	.000	.625	.000	.000	.625	.250	.500	.250	.000	.500	.000	.625	.250	.000	.656	.750

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Start Date : 11/17/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	5
07:15 AM	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0	4
07:30 AM	0	0	0	0	3	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5
07:45 AM	0	0	0	0	5	0	0	1	1	0	0	0	0	2	0	0	0	0	0	0	9
Total	0	0	0	2	10	1	0	1	2	2	0	0	0	2	1	0	1	0	1	0	23
08:00 AM	0	0	0	0	3	0	1	0	5	0	0	0	0	0	4	0	0	0	0	1	14
08:15 AM	0	0	0	6	4	0	0	0	8	3	0	0	0	4	13	0	0	0	1	4	43
08:30 AM	0	0	0	8	6	0	0	0	16	4	0	0	0	1	23	0	1	0	6	6	71
08:45 AM	0	0	0	21	0	0	0	0	48	2	0	0	0	5	33	0	1	0	2	16	128
Total	0	0	0	35	13	0	1	0	77	9	0	0	0	10	73	0	2	0	9	27	256
Grand Total	0	0	0	37	23	1	1	1	79	11	0	0	0	12	74	0	3	0	10	27	279
Apprch %	0	0	0	61.7	38.3	1.1	1.1	1.1	84.9	11.8	0	0	0	14	86	0	7.5	0	25	67.5	
Total %	0	0	0	13.3	8.2	0.4	0.4	0.4	28.3	3.9	0	0	0	4.3	26.5	0	1.1	0	3.6	9.7	

	Friendship Street From North						Dorrance Street From East						Friendship Street From South						Dorrance Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	0	3	3	0	**1**	0	5	0	6	0	0	0	0	4	4	0	0	0	0	1	1	14
08:15 AM	0	0	0	6	4	10	0	0	0	8	3	11	0	0	0	4	13	17	0	0	0	1	4	5	43
08:30 AM	0	0	0	8	**6**	14	0	0	0	16	**4**	20	0	0	0	1	23	24	0	**1**	0	**6**	6	13	71
08:45 AM	0	0	0	**21**	0	**21**	0	0	0	**48**	2	**50**	0	0	0	**5**	**33**	**38**	0	1	0	2	**16**	**19**	**128**
Total Volume	0	0	0	35	13	48	0	1	0	77	9	87	0	0	0	10	73	83	0	2	0	9	27	38	256
% App. Total	0	0	0	72.9	27.1		0	1.1	0	88.5	10.3		0	0	0	12	88		0	5.3	0	23.7	71.1		
PHF	.000	.000	.000	.417	.542	.571	.000	.250	.000	.401	.563	.435	.000	.000	.000	.500	.553	.546	.000	.500	.000	.375	.422	.500	.500

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N/S: Fiendship Street
E/W: Dorrance Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 A
Site Code : 83460.14
Start Date : 11/17/2015
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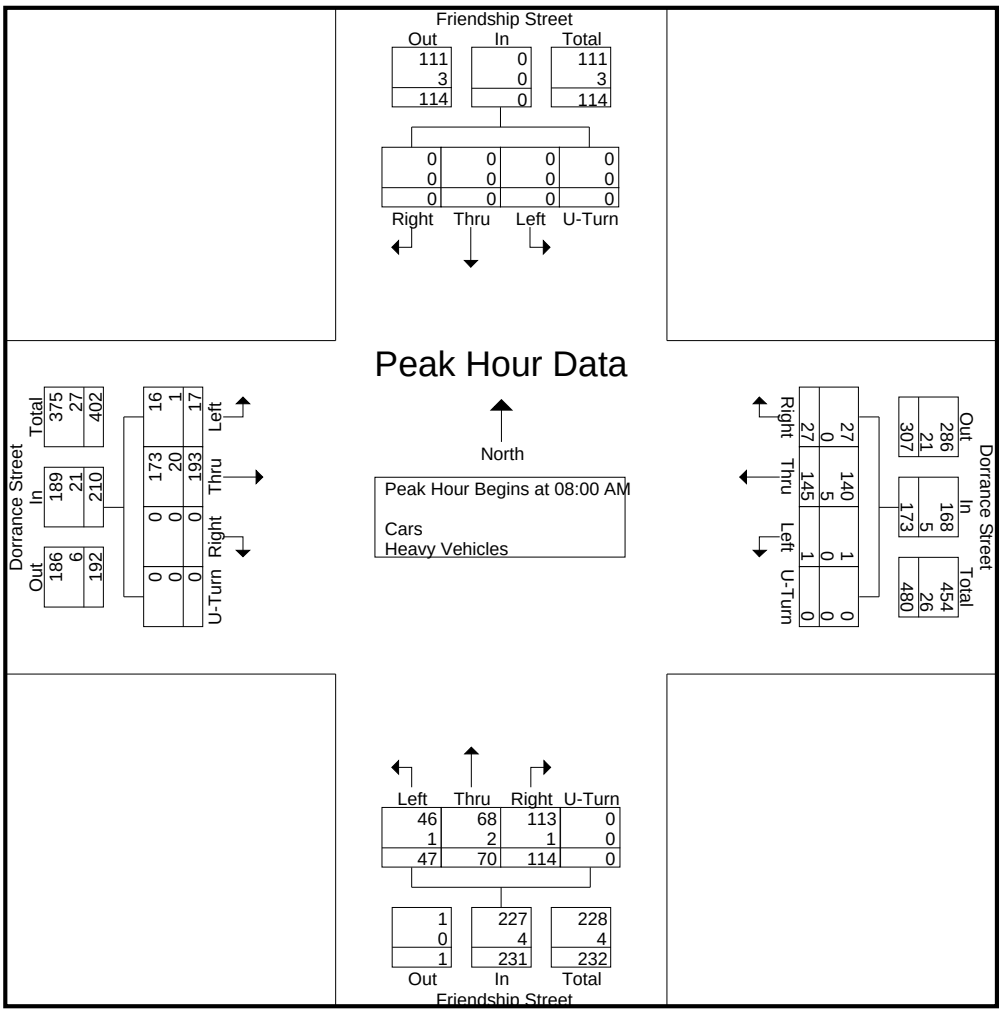
	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	0	0	0	0	0	26	**1**	0	27	17	18	4	0	39	0	32	1	0	33	99
08:15 AM	0	0	0	0	0	3	38	0	0	41	28	14	14	0	56	0	50	3	0	53	150
08:30 AM	0	0	0	0	0	10	30	0	0	40	34	**21**	14	0	**69**	0	**58**	6	0	**64**	173
08:45 AM	0	0	0	0	0	**14**	**51**	0	0	**65**	**35**	17	**15**	0	67	0	53	**7**	0	60	**192**
Total Volume	0	0	0	0	0	27	145	1	0	173	114	70	47	0	231	0	193	17	0	210	614
% App. Total	0	0	0	0		15.6	83.8	0.6	0		49.4	30.3	20.3	0		0	91.9	8.1	0		
PHF	.000	.000	.000	.000	.000	.482	.711	.250	.000	.665	.814	.833	.783	.000	.837	.000	.832	.607	.000	.820	.799
Cars	0	0	0	0	0	27	140	1	0	168	113	68	46	0	227	0	173	16	0	189	584
% Cars	0	0	0	0	0	100	96.6	100	0	97.1	99.1	97.1	97.9	0	98.3	0	89.6	94.1	0	90.0	95.1
Heavy Vehicles	0	0	0	0	0	0	5	0	0	5	1	2	1	0	4	0	20	1	0	21	30
% Heavy Vehicles	0	0	0	0	0	0	3.4	0	0	2.9	0.9	2.9	2.1	0	1.7	0	10.4	5.9	0	10.0	4.9



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File Name : 154800 AA
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	4	30	0	0	24	14	11	0	0	57	3	0	143
04:15 PM	0	0	0	0	1	26	0	0	24	24	13	0	0	49	8	0	145
04:30 PM	0	0	0	0	4	26	0	0	28	45	15	0	0	56	2	0	176
04:45 PM	0	0	0	0	6	31	0	0	14	19	9	0	0	51	11	0	141
Total	0	0	0	0	15	113	0	0	90	102	48	0	0	213	24	0	605
05:00 PM	0	0	0	0	3	31	0	0	21	27	19	0	0	57	6	0	164
05:15 PM	0	0	0	0	2	25	0	0	15	19	12	0	0	50	6	0	129
05:30 PM	0	0	0	0	3	22	0	0	11	16	10	0	0	59	7	0	128
05:45 PM	0	0	0	0	4	29	0	0	15	16	8	0	0	32	8	0	112
Total	0	0	0	0	12	107	0	0	62	78	49	0	0	198	27	0	533
Grand Total	0	0	0	0	27	220	0	0	152	180	97	0	0	411	51	0	1138
Apprch %	0	0	0	0	10.9	89.1	0	0	35.4	42	22.6	0	0	89	11	0	
Total %	0	0	0	0	2.4	19.3	0	0	13.4	15.8	8.5	0	0	36.1	4.5	0	
Cars	0	0	0	0	27	211	0	0	151	179	95	0	0	377	49	0	1089
% Cars	0	0	0	0	100	95.9	0	0	99.3	99.4	97.9	0	0	91.7	96.1	0	95.7
Heavy Vehicles	0	0	0	0	0	9	0	0	1	1	2	0	0	34	2	0	49
% Heavy Vehicles	0	0	0	0	0	4.1	0	0	0.7	0.6	2.1	0	0	8.3	3.9	0	4.3

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	1	26	0	0	27	24	24	13	0	61	0	49	8	0	57	145
04:30 PM	0	0	0	0	0	4	26	0	0	30	**28**	**45**	15	0	**88**	0	56	2	0	58	**176**
04:45 PM	0	0	0	0	0	**6**	**31**	0	0	**37**	14	19	9	0	42	0	51	**11**	0	62	141
05:00 PM	0	0	0	0	0	3	31	0	0	34	21	27	**19**	0	67	0	**57**	6	0	**63**	164
Total Volume	0	0	0	0	0	14	114	0	0	128	87	115	56	0	258	0	213	27	0	240	626
% App. Total	0	0	0	0		10.9	89.1	0	0		33.7	44.6	21.7	0		0	88.8	11.2	0		
PHF	.000	.000	.000	.000	.000	.583	.919	.000	.000	.865	.777	.639	.737	.000	.733	.000	.934	.614	.000	.952	.889
Cars	0	0	0	0	0	14	110	0	0	124	87	115	54	0	256	0	195	25	0	220	600
% Cars	0	0	0	0	0	100	96.5	0	0	96.9	100	100	96.4	0	99.2	0	91.5	92.6	0	91.7	95.8
Heavy Vehicles	0	0	0	0	0	0	4	0	0	4	0	0	2	0	2	0	18	2	0	20	26
% Heavy Vehicles	0	0	0	0	0	0	3.5	0	0	3.1	0	0	3.6	0	0.8	0	8.5	7.4	0	8.3	4.2

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City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 AA
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	4	28	0	0	23	14	11	0	0	53	3	0	136
04:15 PM	0	0	0	0	1	26	0	0	24	24	13	0	0	44	6	0	138
04:30 PM	0	0	0	0	4	24	0	0	28	45	15	0	0	49	2	0	167
04:45 PM	0	0	0	0	6	31	0	0	14	19	8	0	0	49	11	0	138
Total	0	0	0	0	15	109	0	0	89	102	47	0	0	195	22	0	579
05:00 PM	0	0	0	0	3	29	0	0	21	27	18	0	0	53	6	0	157
05:15 PM	0	0	0	0	2	24	0	0	15	18	12	0	0	47	6	0	124
05:30 PM	0	0	0	0	3	22	0	0	11	16	10	0	0	55	7	0	124
05:45 PM	0	0	0	0	4	27	0	0	15	16	8	0	0	27	8	0	105
Total	0	0	0	0	12	102	0	0	62	77	48	0	0	182	27	0	510
Grand Total	0	0	0	0	27	211	0	0	151	179	95	0	0	377	49	0	1089
Apprch %	0	0	0	0	11.3	88.7	0	0	35.5	42.1	22.4	0	0	88.5	11.5	0	
Total %	0	0	0	0	2.5	19.4	0	0	13.9	16.4	8.7	0	0	34.6	4.5	0	

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	1	26	0	0	27	24	24	13	0	61	0	44	6	0	50	138
04:30 PM	0	0	0	0	0	4	24	0	0	28	**28**	**45**	15	0	**88**	0	49	2	0	51	**167**
04:45 PM	0	0	0	0	0	**6**	**31**	0	0	**37**	14	19	8	0	41	0	49	**11**	0	**60**	138
05:00 PM	0	0	0	0	0	3	29	0	0	32	21	27	**18**	0	66	0	**53**	6	0	59	157
Total Volume	0	0	0	0	0	14	110	0	0	124	87	115	54	0	256	0	195	25	0	220	600
% App. Total	0	0	0	0		11.3	88.7	0	0		34	44.9	21.1	0		0	88.6	11.4	0		
PHF	.000	.000	.000	.000	.000	.583	.887	.000	.000	.838	.777	.639	.750	.000	.727	.000	.920	.568	.000	.917	.898

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Client: VHB/ K. Caouette

File Name : 154800 AA
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Heavy Vehicles

	Friendship Street From North				Dorrance Street From East				Friendship Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	0	2	0	0	1	0	0	0	0	4	0	0	7
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	0	7
04:30 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	7	0	0	9
04:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	2	0	0	3
Total	0	0	0	0	0	4	0	0	1	0	1	0	0	18	2	0	26
05:00 PM	0	0	0	0	0	2	0	0	0	0	1	0	0	4	0	0	7
05:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	3	0	0	5
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	5	0	0	7
Total	0	0	0	0	0	5	0	0	0	1	1	0	0	16	0	0	23
Grand Total	0	0	0	0	0	9	0	0	1	1	2	0	0	34	2	0	49
Apprch %	0	0	0	0	0	100	0	0	25	25	50	0	0	94.4	5.6	0	
Total %	0	0	0	0	0	18.4	0	0	2	2	4.1	0	0	69.4	4.1	0	

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	0	**2**	0	0	**2**	**1**	0	0	0	**1**	0	4	0	0	4	7
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	**2**	0	**7**	7
04:30 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	**7**	0	0	7	**9**
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1	0	2	0	0	2	3
Total Volume	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	0	18	2	0	20	26
% App. Total	0	0	0	0		0	100	0	0		50	0	50	0		0	90	10	0		
PHF	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.250	.000	.250	.000	.500	.000	.643	.250	.000	.714	.722

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File Name : 154800 AA
Site Code : 83460.14
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Groups Printed- Peds and Bicycles

	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	3	1	0	1	0	1	3	0	0	0	3	1	0	0	0	0	0	13
04:15 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	5	3	0	1	0	1	0	12
04:30 PM	0	0	0	1	3	0	0	0	1	4	0	0	0	6	2	0	0	0	1	0	18
04:45 PM	0	0	0	0	3	0	0	0	1	0	0	0	0	3	1	0	0	0	0	2	10
Total	0	0	0	6	7	0	1	0	3	7	0	0	0	17	7	0	1	0	2	2	53
05:00 PM	0	0	0	3	3	0	0	0	0	1	0	1	0	3	4	0	0	0	0	1	16
05:15 PM	0	0	0	4	3	0	0	0	0	0	0	0	0	8	2	0	0	0	0	0	17
05:30 PM	0	0	0	3	3	0	0	0	0	0	0	1	0	7	2	0	0	0	5	0	21
05:45 PM	0	0	0	1	4	0	0	0	3	1	0	0	0	5	1	0	0	0	0	0	15
Total	0	0	0	11	13	0	0	0	3	2	0	2	0	23	9	0	0	0	5	1	69
Grand Total	0	0	0	17	20	0	1	0	6	9	0	2	0	40	16	0	1	0	7	3	122
Apprch %	0	0	0	45.9	54.1	0	6.2	0	37.5	56.2	0	3.4	0	69	27.6	0	9.1	0	63.6	27.3	
Total %	0	0	0	13.9	16.4	0	0.8	0	4.9	7.4	0	1.6	0	32.8	13.1	0	0.8	0	5.7	2.5	

	Friendship Street From North						Dorrance Street From East						Friendship Street From South						Dorrance Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 05:00 PM																									
05:00 PM	0	0	0	3	3	6	0	0	0	0	**1**	1	0	**1**	0	3	**4**	8	0	0	0	0	**1**	1	16
05:15 PM	0	0	0	**4**	3	**7**	0	0	0	0	0	0	0	0	0	**8**	2	**10**	0	0	0	0	0	0	17
05:30 PM	0	0	0	3	3	6	0	0	0	0	0	0	0	1	0	7	2	10	0	0	0	**5**	0	**5**	**21**
05:45 PM	0	0	0	1	**4**	5	0	0	0	**3**	1	**4**	0	0	0	5	1	6	0	0	0	0	0	0	15
Total Volume	0	0	0	11	13	24	0	0	0	3	2	5	0	2	0	23	9	34	0	0	0	5	1	6	69
% App. Total	0	0	0	45.8	54.2		0	0	0	60	40		0	5.9	0	67.6	26.5		0	0	0	83.3	16.7		
PHF	.000	.000	.000	.688	.813	.857	.000	.000	.000	.250	.500	.313	.000	.500	.000	.719	.563	.850	.000	.000	.000	.250	.250	.300	.821

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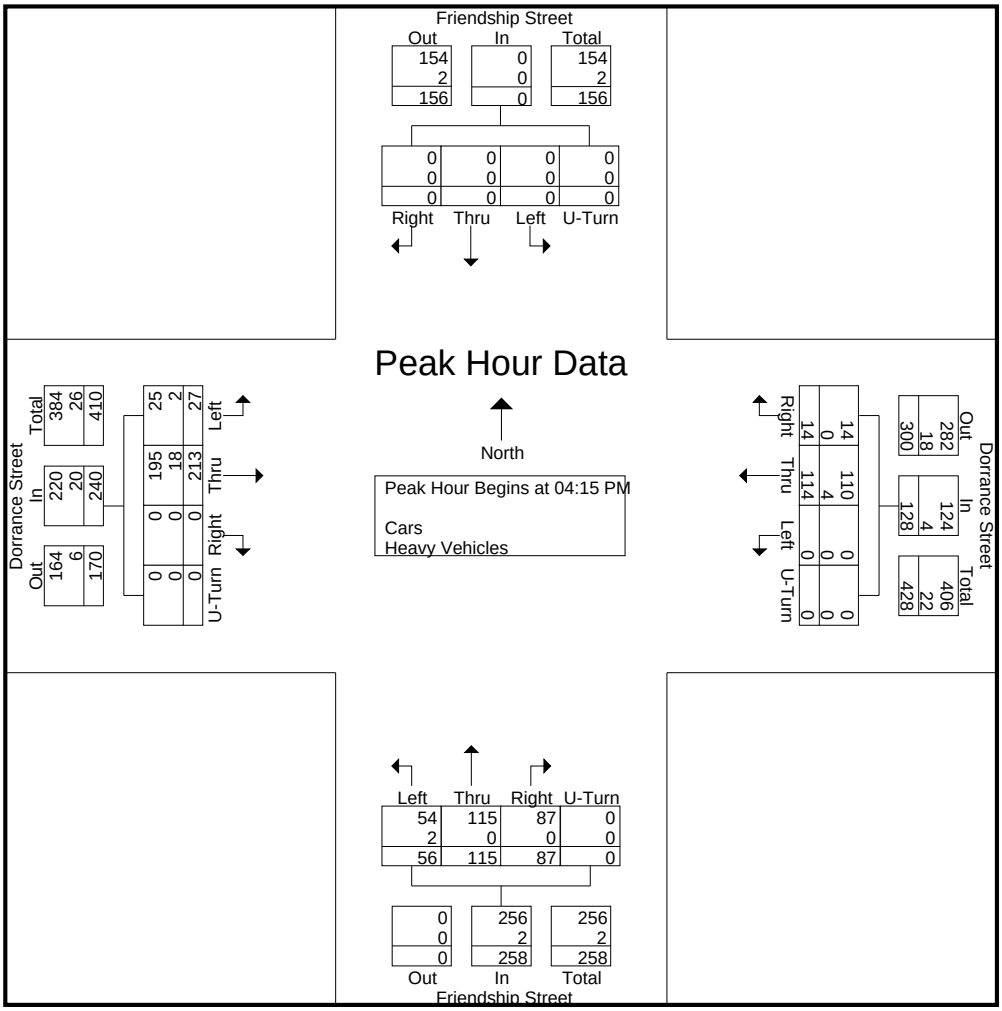
	Friendship Street From North					Dorrance Street From East					Friendship Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	1	26	0	0	27	24	24	13	0	61	0	49	8	0	57	145
04:30 PM	0	0	0	0	0	4	26	0	0	30	**28**	**45**	15	0	**88**	0	56	2	0	58	**176**
04:45 PM	0	0	0	0	0	**6**	**31**	0	0	**37**	14	19	9	0	42	0	51	**11**	0	62	141
05:00 PM	0	0	0	0	0	3	31	0	0	34	21	27	**19**	0	67	0	**57**	6	0	**63**	164
Total Volume	0	0	0	0	0	14	114	0	0	128	87	115	56	0	258	0	213	27	0	240	626
% App. Total	0	0	0	0		10.9	89.1	0	0		33.7	44.6	21.7	0		0	88.8	11.2	0		
PHF	.000	.000	.000	.000	.000	.583	.919	.000	.000	.865	.777	.639	.737	.000	.733	.000	.934	.614	.000	.952	.889
Cars	0	0	0	0	0	14	110	0	0	124	87	115	54	0	256	0	195	25	0	220	600
% Cars	0	0	0	0	0	100	96.5	0	0	96.9	100	100	96.4	0	99.2	0	91.5	92.6	0	91.7	95.8
Heavy Vehicles	0	0	0	0	0	0	4	0	0	4	0	0	2	0	2	0	18	2	0	20	26
% Heavy Vehicles	0	0	0	0	0	0	3.5	0	0	3.1	0	0	3.6	0	0.8	0	8.5	7.4	0	8.3	4.2



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N/S: Clifford Street
E/W: Dorrance Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 B
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	3	9	0	0	0	12	0	0	0	0	0	0	3	12	0	0	39
07:15 AM	7	16	0	0	0	13	5	0	0	0	0	0	3	17	0	0	61
07:30 AM	4	20	0	0	0	17	6	0	0	0	0	0	13	18	0	0	78
07:45 AM	3	19	0	0	0	27	10	0	0	0	0	0	13	20	0	0	92
Total	17	64	0	0	0	69	21	0	0	0	0	0	32	67	0	0	270
08:00 AM	11	30	0	0	0	26	15	0	0	0	0	0	21	21	0	0	124
08:15 AM	10	54	0	0	0	46	21	0	0	0	0	0	49	24	0	0	204
08:30 AM	20	58	3	0	0	33	19	0	0	0	0	0	40	39	0	0	212
08:45 AM	27	38	2	0	0	51	20	0	0	0	0	0	42	39	0	0	219
Total	68	180	5	0	0	156	75	0	0	0	0	0	152	123	0	0	759
Grand Total	85	244	5	0	0	225	96	0	0	0	0	0	184	190	0	0	1029
Apprch %	25.4	73.1	1.5	0	0	70.1	29.9	0	0	0	0	0	49.2	50.8	0	0	
Total %	8.3	23.7	0.5	0	0	21.9	9.3	0	0	0	0	0	17.9	18.5	0	0	
Cars	84	236	5	0	0	214	95	0	0	0	0	0	180	157	0	0	971
% Cars	98.8	96.7	100	0	0	95.1	99	0	0	0	0	0	97.8	82.6	0	0	94.4
Heavy Vehicles	1	8	0	0	0	11	1	0	0	0	0	0	4	33	0	0	58
% Heavy Vehicles	1.2	3.3	0	0	0	4.9	1	0	0	0	0	0	2.2	17.4	0	0	5.6

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	11	30	0	0	41	0	26	15	0	41	0	0	0	0	0	21	21	0	0	42	124
08:15 AM	10	54	0	0	64	0	46	**21**	0	67	0	0	0	0	0	**49**	24	0	0	73	204
08:30 AM	20	**58**	**3**	0	**81**	0	33	19	0	52	0	0	0	0	0	40	**39**	0	0	79	212
08:45 AM	**27**	38	2	0	67	0	**51**	20	0	**71**	0	0	0	0	0	42	39	0	0	**81**	**219**
Total Volume	68	180	5	0	253	0	156	75	0	231	0	0	0	0	0	152	123	0	0	275	759
% App. Total	26.9	71.1	2	0		0	67.5	32.5	0		0	0	0	0		55.3	44.7	0	0		
PHF	.630	.776	.417	.000	.781	.000	.765	.893	.000	.813	.000	.000	.000	.000	.000	.776	.788	.000	.000	.849	.866
Cars	68	177	5	0	250	0	150	74	0	224	0	0	0	0	0	150	106	0	0	256	730
% Cars	100	98.3	100	0	98.8	0	96.2	98.7	0	97.0	0	0	0	0	0	98.7	86.2	0	0	93.1	96.2
Heavy Vehicles	0	3	0	0	3	0	6	1	0	7	0	0	0	0	0	2	17	0	0	19	29
% Heavy Vehicles	0	1.7	0	0	1.2	0	3.8	1.3	0	3.0	0	0	0	0	0	1.3	13.8	0	0	6.9	3.8

N/S: Clifford Street
E/W: Dorrance Street
City, State: Providence, RI
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Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	2	9	0	0	0	9	0	0	0	0	0	0	3	7	0	0	30
07:15 AM	7	14	0	0	0	12	5	0	0	0	0	0	3	15	0	0	56
07:30 AM	4	20	0	0	0	17	6	0	0	0	0	0	12	13	0	0	72
07:45 AM	3	16	0	0	0	26	10	0	0	0	0	0	12	16	0	0	83
Total	16	59	0	0	0	64	21	0	0	0	0	0	30	51	0	0	241
08:00 AM	11	30	0	0	0	25	15	0	0	0	0	0	20	19	0	0	120
08:15 AM	10	54	0	0	0	45	21	0	0	0	0	0	48	17	0	0	195
08:30 AM	20	57	3	0	0	32	18	0	0	0	0	0	40	34	0	0	204
08:45 AM	27	36	2	0	0	48	20	0	0	0	0	0	42	36	0	0	211
Total	68	177	5	0	0	150	74	0	0	0	0	0	150	106	0	0	730
Grand Total	84	236	5	0	0	214	95	0	0	0	0	0	180	157	0	0	971
Apprch %	25.8	72.6	1.5	0	0	69.3	30.7	0	0	0	0	0	53.4	46.6	0	0	
Total %	8.7	24.3	0.5	0	0	22	9.8	0	0	0	0	0	18.5	16.2	0	0	

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	11	30	0	0	41	0	25	15	0	40	0	0	0	0	0	20	19	0	0	39	120
08:15 AM	10	54	0	0	64	0	45	**21**	0	66	0	0	0	0	0	**48**	17	0	0	65	195
08:30 AM	20	**57**	**3**	0	**80**	0	32	18	0	50	0	0	0	0	0	40	34	0	0	74	204
08:45 AM	**27**	36	2	0	65	0	**48**	20	0	**68**	0	0	0	0	0	42	**36**	0	0	**78**	**211**
Total Volume	68	177	5	0	250	0	150	74	0	224	0	0	0	0	0	150	106	0	0	256	730
% App. Total	27.2	70.8	2	0		0	67	33	0		0	0	0	0		58.6	41.4	0	0		
PHF	.630	.776	.417	.000	.781	.000	.781	.881	.000	.824	.000	.000	.000	.000	.000	.781	.736	.000	.000	.821	.865

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Groups Printed- Heavy Vehicles

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	0	0	0	0	3	0	0	0	0	0	0	0	5	0	0	9
07:15 AM	0	2	0	0	0	1	0	0	0	0	0	0	0	2	0	0	5
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	6
07:45 AM	0	3	0	0	0	1	0	0	0	0	0	0	1	4	0	0	9
Total	1	5	0	0	0	5	0	0	0	0	0	0	2	16	0	0	29
08:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0	4
08:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	1	7	0	0	9
08:30 AM	0	1	0	0	0	1	1	0	0	0	0	0	0	5	0	0	8
08:45 AM	0	2	0	0	0	3	0	0	0	0	0	0	0	3	0	0	8
Total	0	3	0	0	0	6	1	0	0	0	0	0	2	17	0	0	29
Grand Total	1	8	0	0	0	11	1	0	0	0	0	0	4	33	0	0	58
Apprch %	11.1	88.9	0	0	0	91.7	8.3	0	0	0	0	0	10.8	89.2	0	0	
Total %	1.7	13.8	0	0	0	19	1.7	0	0	0	0	0	6.9	56.9	0	0	

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	**3**	0	0	**3**	0	**1**	0	0	1	0	0	0	0	0	**1**	4	0	0	5	**9**
08:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	2	0	0	3	4
08:15 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	**7**	0	0	**8**	9
08:30 AM	0	1	0	0	1	0	1	**1**	0	**2**	0	0	0	0	0	0	5	0	0	5	8
Total Volume	0	4	0	0	4	0	4	1	0	5	0	0	0	0	0	3	18	0	0	21	30
% App. Total	0	100	0	0		0	80	20	0		0	0	0	0		14.3	85.7	0	0		
PHF	.000	.333	.000	.000	.333	.000	1.00	.250	.000	.625	.000	.000	.000	.000	.000	.750	.643	.000	.000	.656	.833

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File Name : 154800 B
Site Code : 83460.14
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Groups Printed- Peds and Bicycles

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
07:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1	1	5
07:30 AM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	2
07:45 AM	0	0	0	0	2	0	1	0	0	0	0	0	0	1	0	0	0	0	1	0	5
Total	0	0	0	0	2	0	2	0	1	0	0	0	0	1	2	0	1	0	3	1	13
08:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	2	1	5
08:15 AM	0	0	0	0	2	0	0	1	0	1	0	0	0	2	1	0	0	0	1	8	16
08:30 AM	0	0	0	0	0	0	0	0	1	2	0	0	0	9	0	0	1	0	0	2	15
08:45 AM	0	1	0	2	2	0	0	0	1	0	0	0	0	26	2	0	1	0	1	6	42
Total	0	1	0	2	4	0	1	1	2	3	0	0	0	37	4	0	2	0	4	17	78
Grand Total	0	1	0	2	6	0	3	1	3	3	0	0	0	38	6	0	3	0	7	18	91
Apprch %	0	11.1	0	22.2	66.7	0	30	10	30	30	0	0	0	86.4	13.6	0	10.7	0	25	64.3	
Total %	0	1.1	0	2.2	6.6	0	3.3	1.1	3.3	3.3	0	0	0	41.8	6.6	0	3.3	0	7.7	19.8	

	Clifford Street From North						Dorrance Street From East						Clifford Street From South						Dorrance Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	0	0	0	0	**1**	0	0	0	1	0	0	0	0	1	1	0	0	0	**2**	1	3	5
08:15 AM	0	0	0	0	**2**	2	0	0	**1**	0	1	2	0	0	0	2	1	3	0	0	0	1	**8**	**9**	16
08:30 AM	0	0	0	0	0	0	0	0	0	**1**	**2**	**3**	0	0	0	9	0	9	0	**1**	0	0	2	3	15
08:45 AM	0	**1**	0	**2**	2	**5**	0	0	0	1	0	1	0	0	0	**26**	**2**	**28**	0	1	0	1	6	8	**42**
Total Volume	0	1	0	2	4	7	0	1	1	2	3	7	0	0	0	37	4	41	0	2	0	4	17	23	78
% App. Total	0	14.3	0	28.6	57.1		0	14.3	14.3	28.6	42.9		0	0	0	90.2	9.8		0	8.7	0	17.4	73.9		
PHF	.000	.250	.000	.250	.500	.350	.000	.250	.250	.500	.375	.583	.000	.000	.000	.356	.500	.366	.000	.500	.000	.500	.531	.639	.464

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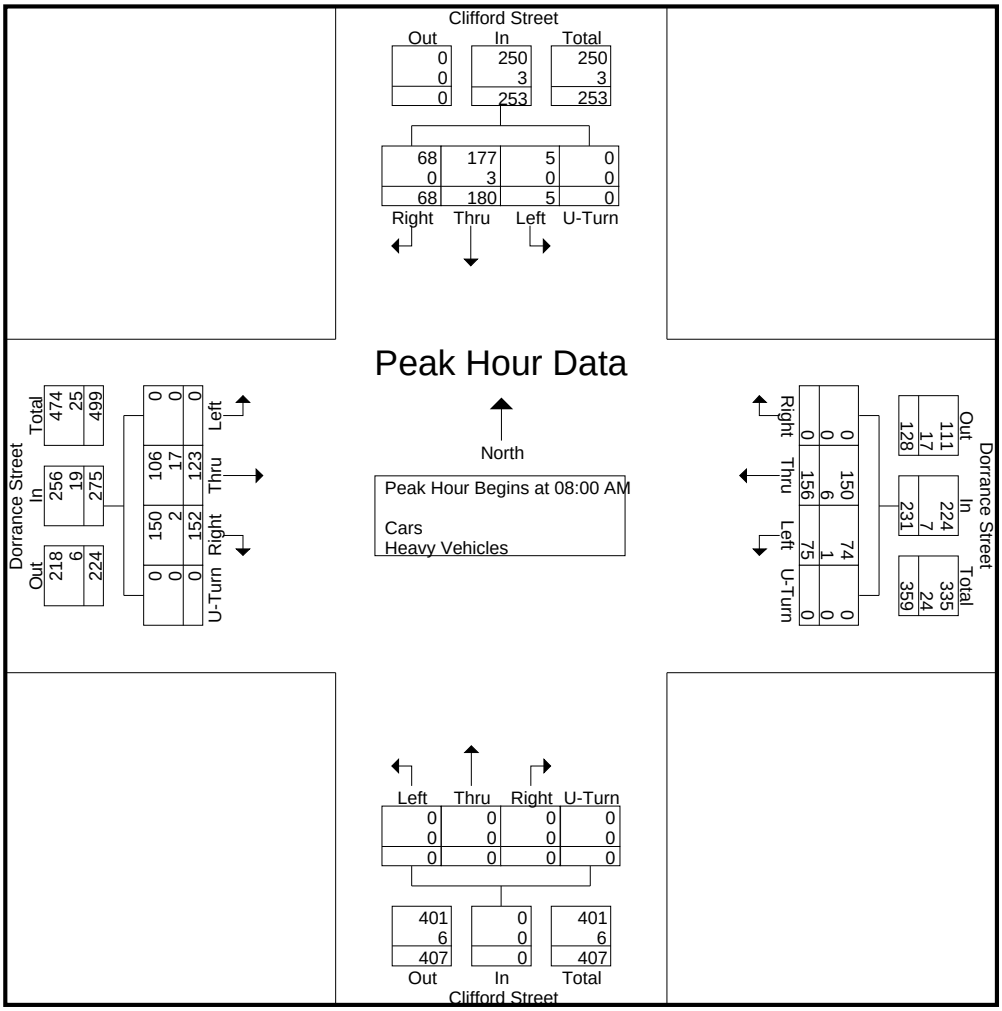
	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	11	30	0	0	41	0	26	15	0	41	0	0	0	0	0	21	21	0	0	42	124
08:15 AM	10	54	0	0	64	0	46	**21**	0	67	0	0	0	0	0	**49**	24	0	0	73	204
08:30 AM	20	**58**	**3**	0	**81**	0	33	19	0	52	0	0	0	0	0	40	**39**	0	0	79	212
08:45 AM	**27**	38	2	0	67	0	**51**	20	0	**71**	0	0	0	0	0	42	39	0	0	**81**	**219**
Total Volume	68	180	5	0	253	0	156	75	0	231	0	0	0	0	0	152	123	0	0	275	759
% App. Total	26.9	71.1	2	0		0	67.5	32.5	0		0	0	0	0		55.3	44.7	0	0		
PHF	.630	.776	.417	.000	.781	.000	.765	.893	.000	.813	.000	.000	.000	.000	.000	.776	.788	.000	.000	.849	.866
Cars	68	177	5	0	250	0	150	74	0	224	0	0	0	0	0	150	106	0	0	256	730
% Cars	100	98.3	100	0	98.8	0	96.2	98.7	0	97.0	0	0	0	0	0	98.7	86.2	0	0	93.1	96.2
Heavy Vehicles	0	3	0	0	3	0	6	1	0	7	0	0	0	0	0	2	17	0	0	19	29
% Heavy Vehicles	0	1.7	0	0	1.2	0	3.8	1.3	0	3.0	0	0	0	0	0	1.3	13.8	0	0	6.9	3.8



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Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	2	29	1	0	0	27	4	0	0	0	0	0	24	60	0	0	147
04:15 PM	4	22	0	0	0	21	3	0	0	0	0	0	21	55	0	0	126
04:30 PM	2	46	0	0	0	24	3	0	0	0	0	0	30	58	0	0	163
04:45 PM	5	42	0	0	0	32	4	0	0	0	0	0	22	41	0	0	146
Total	13	139	1	0	0	104	14	0	0	0	0	0	97	214	0	0	582
05:00 PM	5	51	4	0	0	29	0	0	0	0	0	0	25	60	0	0	174
05:15 PM	4	59	1	0	0	21	2	0	0	0	0	0	15	54	0	0	156
05:30 PM	4	40	2	0	0	19	3	0	0	0	0	0	14	55	0	0	137
05:45 PM	6	38	2	0	0	25	6	0	0	0	0	0	17	31	0	0	125
Total	19	188	9	0	0	94	11	0	0	0	0	0	71	200	0	0	592
Grand Total	32	327	10	0	0	198	25	0	0	0	0	0	168	414	0	0	1174
Apprch %	8.7	88.6	2.7	0	0	88.8	11.2	0	0	0	0	0	28.9	71.1	0	0	
Total %	2.7	27.9	0.9	0	0	16.9	2.1	0	0	0	0	0	14.3	35.3	0	0	
Cars	32	319	10	0	0	189	25	0	0	0	0	0	167	380	0	0	1122
% Cars	100	97.6	100	0	0	95.5	100	0	0	0	0	0	99.4	91.8	0	0	95.6
Heavy Vehicles	0	8	0	0	0	9	0	0	0	0	0	0	1	34	0	0	52
% Heavy Vehicles	0	2.4	0	0	0	4.5	0	0	0	0	0	0	0.6	8.2	0	0	4.4

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	46	0	0	48	0	24	3	0	27	0	0	0	0	0	**30**	58	0	0	**88**	163
04:45 PM	**5**	42	0	0	47	0	**32**	**4**	0	**36**	0	0	0	0	0	22	41	0	0	63	146
05:00 PM	5	51	**4**	0	60	0	29	0	0	29	0	0	0	0	0	25	**60**	0	0	85	**174**
05:15 PM	4	**59**	1	0	**64**	0	21	2	0	23	0	0	0	0	0	15	54	0	0	69	156
Total Volume	16	198	5	0	219	0	106	9	0	115	0	0	0	0	0	92	213	0	0	305	639
% App. Total	7.3	90.4	2.3	0		0	92.2	7.8	0		0	0	0	0		30.2	69.8	0	0		
PHF	.800	.839	.313	.000	.855	.000	.828	.563	.000	.799	.000	.000	.000	.000	.000	.767	.888	.000	.000	.866	.918
Cars	16	194	5	0	215	0	101	9	0	110	0	0	0	0	0	92	198	0	0	290	615
% Cars	100	98.0	100	0	98.2	0	95.3	100	0	95.7	0	0	0	0	0	100	93.0	0	0	95.1	96.2
Heavy Vehicles	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	0	15	0	0	15	24
% Heavy Vehicles	0	2.0	0	0	1.8	0	4.7	0	0	4.3	0	0	0	0	0	0	7.0	0	0	4.9	3.8

N/S: Clifford Street
E/W: Dorrance Street
City, State: Providence, RI
Client: VHB/ K. Caouette

PRECISION DATA INDUSTRIES, LLC
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File Name : 154800 BB
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	2	27	1	0	0	25	4	0	0	0	0	0	24	55	0	0	138
04:15 PM	4	22	0	0	0	21	3	0	0	0	0	0	20	50	0	0	120
04:30 PM	2	44	0	0	0	22	3	0	0	0	0	0	30	52	0	0	153
04:45 PM	5	41	0	0	0	32	4	0	0	0	0	0	22	39	0	0	143
Total	13	134	1	0	0	100	14	0	0	0	0	0	96	196	0	0	554
05:00 PM	5	51	4	0	0	27	0	0	0	0	0	0	25	56	0	0	168
05:15 PM	4	58	1	0	0	20	2	0	0	0	0	0	15	51	0	0	151
05:30 PM	4	38	2	0	0	19	3	0	0	0	0	0	14	52	0	0	132
05:45 PM	6	38	2	0	0	23	6	0	0	0	0	0	17	25	0	0	117
Total	19	185	9	0	0	89	11	0	0	0	0	0	71	184	0	0	568
Grand Total	32	319	10	0	0	189	25	0	0	0	0	0	167	380	0	0	1122
Apprch %	8.9	88.4	2.8	0	0	88.3	11.7	0	0	0	0	0	30.5	69.5	0	0	
Total %	2.9	28.4	0.9	0	0	16.8	2.2	0	0	0	0	0	14.9	33.9	0	0	

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	44	0	0	46	0	22	3	0	25	0	0	0	0	0	**30**	52	0	0	**82**	153
04:45 PM	**5**	41	0	0	46	0	**32**	**4**	0	**36**	0	0	0	0	0	22	39	0	0	61	143
05:00 PM	5	51	**4**	0	60	0	27	0	0	27	0	0	0	0	0	25	**56**	0	0	81	**168**
05:15 PM	4	**58**	1	0	**63**	0	20	2	0	22	0	0	0	0	0	15	51	0	0	66	151
Total Volume	16	194	5	0	215	0	101	9	0	110	0	0	0	0	0	92	198	0	0	290	615
% App. Total	7.4	90.2	2.3	0		0	91.8	8.2	0		0	0	0	0		31.7	68.3	0	0		
PHF	.800	.836	.313	.000	.853	.000	.789	.563	.000	.764	.000	.000	.000	.000	.000	.767	.884	.000	.000	.884	.915

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N/S: Clifford Street
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City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 BB
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Heavy Vehicles

	Clifford Street From North				Dorrance Street From East				Clifford Street From South				Dorrance Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	5	0	0	9
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	6
04:30 PM	0	2	0	0	0	2	0	0	0	0	0	0	0	6	0	0	10
04:45 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	3
Total	0	5	0	0	0	4	0	0	0	0	0	0	1	18	0	0	28
05:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	4	0	0	6
05:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	3	0	0	5
05:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5
05:45 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	6	0	0	8
Total	0	3	0	0	0	5	0	0	0	0	0	0	0	16	0	0	24
Grand Total	0	8	0	0	0	9	0	0	0	0	0	0	1	34	0	0	52
Apprch %	0	100	0	0	0	100	0	0	0	0	0	0	2.9	97.1	0	0	
Total %	0	15.4	0	0	0	17.3	0	0	0	0	0	0	1.9	65.4	0	0	

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	**2**	0	0	**2**	0	**2**	0	0	**2**	0	0	0	0	0	0	5	0	0	5	9
04:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	5	0	0	**6**	6
04:30 PM	0	2	0	0	2	0	2	0	0	2	0	0	0	0	0	0	**6**	0	0	6	**10**
04:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	3
Total Volume	0	5	0	0	5	0	4	0	0	4	0	0	0	0	0	1	18	0	0	19	28
% App. Total	0	100	0	0		0	100	0	0		0	0	0	0		5.3	94.7	0	0		
PHF	.000	.625	.000	.000	.625	.000	.500	.000	.000	.500	.000	.000	.000	.000	.000	.250	.750	.000	.000	.792	.700

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City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 BB
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Peds and Bicycles

	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	2	0	0	1	0	0	0	0	0	0	3	5	0	0	0	1	2	14
04:15 PM	0	0	0	1	2	0	0	0	1	0	0	0	0	1	9	0	0	0	1	2	17
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	1	9
04:45 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	1	2	0	0	0	0	0	5
Total	0	0	0	3	2	0	2	0	2	0	0	0	0	6	23	0	0	0	2	5	45
05:00 PM	0	0	0	1	1	0	0	0	0	1	0	0	0	3	4	0	0	0	0	0	10
05:15 PM	0	0	0	0	3	0	0	0	0	3	0	0	0	3	2	0	0	0	0	1	12
05:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	4
05:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	3
Total	0	0	0	2	5	0	0	0	0	4	0	0	0	9	6	0	0	0	2	1	29
Grand Total	0	0	0	5	7	0	2	0	2	4	0	0	0	15	29	0	0	0	4	6	74
Apprch %	0	0	0	41.7	58.3	0	25	0	25	50	0	0	0	34.1	65.9	0	0	0	40	60	
Total %	0	0	0	6.8	9.5	0	2.7	0	2.7	5.4	0	0	0	20.3	39.2	0	0	0	5.4	8.1	

	Clifford Street From North						Dorrance Street From East						Clifford Street From South						Dorrance Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	0	0	**2**	0	2	0	**1**	0	0	0	1	0	0	0	**3**	5	8	0	0	0	**1**	**2**	**3**	14
04:15 PM	0	0	0	1	**2**	**3**	0	0	0	**1**	0	1	0	0	0	1	**9**	**10**	0	0	0	1	2	3	**17**
04:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	8	0	0	0	0	1	1	9
04:45 PM	0	0	0	0	0	0	0	1	0	1	0	**2**	0	0	0	1	2	3	0	0	0	0	0	0	5
Total Volume	0	0	0	3	2	5	0	2	0	2	0	4	0	0	0	6	23	29	0	0	0	2	5	7	45
% App. Total	0	0	0	60	40		0	50	0	50	0		0	0	0	20.7	79.3		0	0	0	28.6	71.4		
PHF	.000	.000	.000	.375	.250	.417	.000	.500	.000	.500	.000	.500	.000	.000	.000	.500	.639	.725	.000	.000	.000	.500	.625	.583	.662

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File Name : 154800 BB
Site Code : 83460.14
Start Date : 11/17/2015
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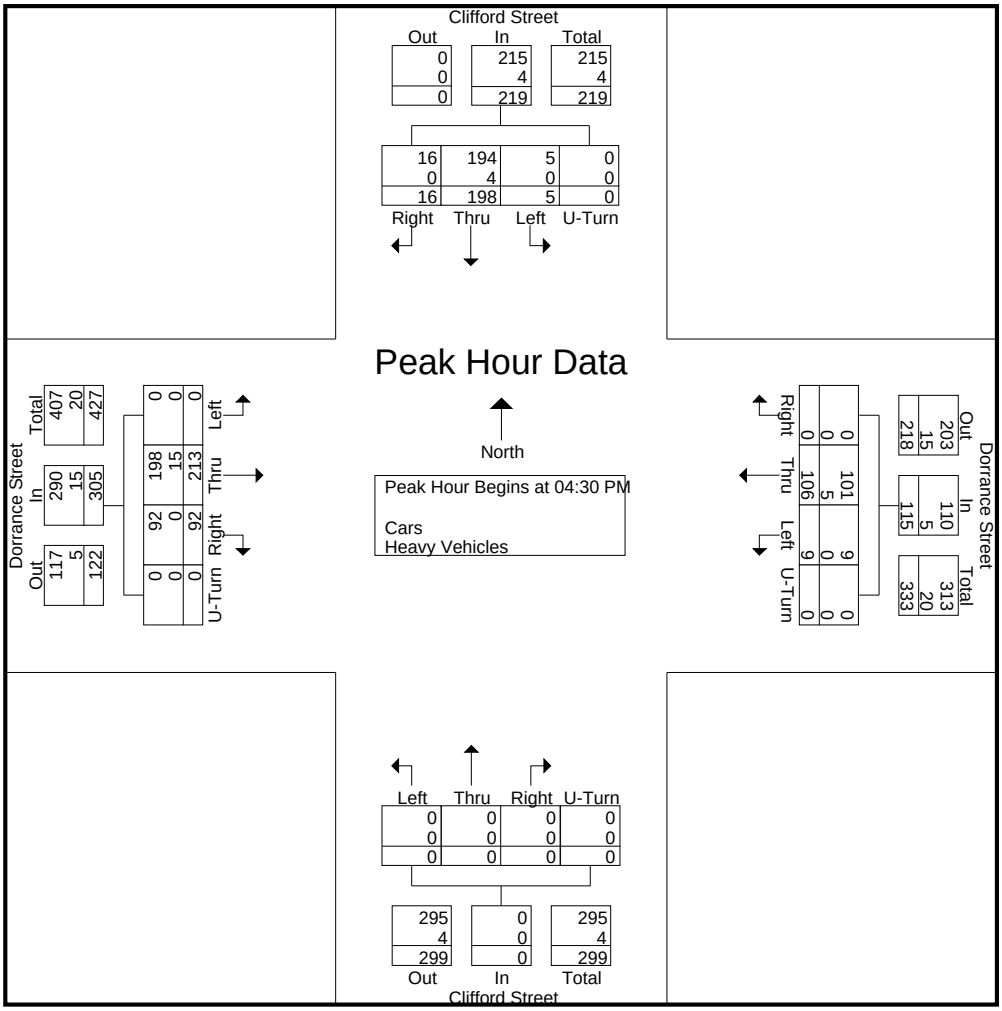
	Clifford Street From North					Dorrance Street From East					Clifford Street From South					Dorrance Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	2	46	0	0	48	0	24	3	0	27	0	0	0	0	0	**30**	58	0	0	**88**	163
04:45 PM	**5**	42	0	0	47	0	**32**	**4**	0	**36**	0	0	0	0	0	22	41	0	0	63	146
05:00 PM	5	51	**4**	0	60	0	29	0	0	29	0	0	0	0	0	25	**60**	0	0	85	**174**
05:15 PM	4	**59**	1	0	**64**	0	21	2	0	23	0	0	0	0	0	15	54	0	0	69	156
Total Volume	16	198	5	0	219	0	106	9	0	115	0	0	0	0	0	92	213	0	0	305	639
% App. Total	7.3	90.4	2.3	0		0	92.2	7.8	0		0	0	0	0		30.2	69.8	0	0		
PHF	.800	.839	.313	.000	.855	.000	.828	.563	.000	.799	.000	.000	.000	.000	.000	.767	.888	.000	.000	.866	.918
Cars	16	194	5	0	215	0	101	9	0	110	0	0	0	0	0	92	198	0	0	290	615
% Cars	100	98.0	100	0	98.2	0	95.3	100	0	95.7	0	0	0	0	0	100	93.0	0	0	95.1	96.2
Heavy Vehicles	0	4	0	0	4	0	5	0	0	5	0	0	0	0	0	0	15	0	0	15	24
% Heavy Vehicles	0	2.0	0	0	1.8	0	4.7	0	0	4.3	0	0	0	0	0	0	7.0	0	0	4.9	3.8



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E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 C
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	5	7	0	0	2	7	14	0	0	0	0	0	35
07:15 AM	0	0	0	0	2	16	0	0	1	10	12	0	0	0	0	0	41
07:30 AM	0	0	0	0	6	31	0	0	1	19	8	0	0	0	0	0	65
07:45 AM	0	0	0	0	7	26	0	0	3	18	12	0	0	0	0	0	66
Total	0	0	0	0	20	80	0	0	7	54	46	0	0	0	0	0	207
08:00 AM	1	0	0	0	5	47	0	0	3	32	26	0	0	0	0	0	114
08:15 AM	1	0	0	0	22	60	0	0	3	26	25	0	0	0	0	0	137
08:30 AM	0	0	0	0	25	53	0	0	5	47	22	0	0	0	0	0	152
08:45 AM	0	0	0	0	39	43	0	0	3	38	38	0	0	0	0	0	161
Total	2	0	0	0	91	203	0	0	14	143	111	0	0	0	0	0	564
Grand Total	2	0	0	0	111	283	0	0	21	197	157	0	0	0	0	0	771
Apprch %	100	0	0	0	28.2	71.8	0	0	5.6	52.5	41.9	0	0	0	0	0	
Total %	0.3	0	0	0	14.4	36.7	0	0	2.7	25.6	20.4	0	0	0	0	0	
Cars	2	0	0	0	110	280	0	0	21	196	136	0	0	0	0	0	745
% Cars	100	0	0	0	99.1	98.9	0	0	100	99.5	86.6	0	0	0	0	0	96.6
Heavy Vehicles	0	0	0	0	1	3	0	0	0	1	21	0	0	0	0	0	26
% Heavy Vehicles	0	0	0	0	0.9	1.1	0	0	0	0.5	13.4	0	0	0	0	0	3.4

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**1**	0	0	0	**1**	5	47	0	0	52	3	32	26	0	61	0	0	0	0	0	114
08:15 AM	1	0	0	0	1	22	**60**	0	0	**82**	3	26	25	0	54	0	0	0	0	0	137
08:30 AM	0	0	0	0	0	25	53	0	0	78	**5**	**47**	22	0	74	0	0	0	0	0	152
08:45 AM	0	0	0	0	0	**39**	43	0	0	82	3	38	**38**	0	**79**	0	0	0	0	0	**161**
Total Volume	2	0	0	0	2	91	203	0	0	294	14	143	111	0	268	0	0	0	0	0	564
% App. Total	100	0	0	0		31	69	0	0		5.2	53.4	41.4	0		0	0	0	0		
PHF	.500	.000	.000	.000	.500	.583	.846	.000	.000	.896	.700	.761	.730	.000	.848	.000	.000	.000	.000	.000	.876
Cars	2	0	0	0	2	91	203	0	0	294	14	142	99	0	255	0	0	0	0	0	551
% Cars	100	0	0	0	100	100	100	0	0	100	100	99.3	89.2	0	95.1	0	0	0	0	0	97.7
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	1	12	0	13	0	0	0	0	0	13
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0.7	10.8	0	4.9	0	0	0	0	0	2.3

N/S: Friendship Street
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Groups Printed- Cars

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	4	7	0	0	2	7	12	0	0	0	0	0	32
07:15 AM	0	0	0	0	2	15	0	0	1	10	11	0	0	0	0	0	39
07:30 AM	0	0	0	0	6	30	0	0	1	19	5	0	0	0	0	0	61
07:45 AM	0	0	0	0	7	25	0	0	3	18	9	0	0	0	0	0	62
Total	0	0	0	0	19	77	0	0	7	54	37	0	0	0	0	0	194
08:00 AM	1	0	0	0	5	47	0	0	3	31	22	0	0	0	0	0	109
08:15 AM	1	0	0	0	22	60	0	0	3	26	23	0	0	0	0	0	135
08:30 AM	0	0	0	0	25	53	0	0	5	47	18	0	0	0	0	0	148
08:45 AM	0	0	0	0	39	43	0	0	3	38	36	0	0	0	0	0	159
Total	2	0	0	0	91	203	0	0	14	142	99	0	0	0	0	0	551
Grand Total	2	0	0	0	110	280	0	0	21	196	136	0	0	0	0	0	745
Apprch %	100	0	0	0	28.2	71.8	0	0	5.9	55.5	38.5	0	0	0	0	0	
Total %	0.3	0	0	0	14.8	37.6	0	0	2.8	26.3	18.3	0	0	0	0	0	

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**1**	0	0	0	**1**	5	47	0	0	52	3	31	22	0	56	0	0	0	0	0	109
08:15 AM	1	0	0	0	1	22	**60**	0	0	**82**	3	26	23	0	52	0	0	0	0	0	135
08:30 AM	0	0	0	0	0	25	53	0	0	78	**5**	**47**	18	0	70	0	0	0	0	0	148
08:45 AM	0	0	0	0	0	**39**	43	0	0	82	3	38	**36**	0	**77**	0	0	0	0	0	**159**
Total Volume	2	0	0	0	2	91	203	0	0	294	14	142	99	0	255	0	0	0	0	0	551
% App. Total	100	0	0	0		31	69	0	0		5.5	55.7	38.8	0		0	0	0	0		
PHF	.500	.000	.000	.000	.500	.583	.846	.000	.000	.896	.700	.755	.688	.000	.828	.000	.000	.000	.000	.000	.866

N/S: Friendship Street
E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

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File Name : 154800 C
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Heavy Vehicles

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	0	3
07:15 AM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	4
07:45 AM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	4
Total	0	0	0	0	1	3	0	0	0	0	9	0	0	0	0	0	13
08:00 AM	0	0	0	0	0	0	0	0	0	1	4	0	0	0	0	0	5
08:15 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
08:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	4
08:45 AM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	0	1	12	0	0	0	0	0	13
Grand Total	0	0	0	0	1	3	0	0	0	1	21	0	0	0	0	0	26
Apprch %	0	0	0	0	25	75	0	0	0	4.5	95.5	0	0	0	0	0	
Total %	0	0	0	0	3.8	11.5	0	0	0	3.8	80.8	0	0	0	0	0	

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	0	**1**	0	0	**1**	0	0	1	0	1	0	0	0	0	0	2
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	0	0	0	0	0	4
07:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	0	0	0	0	0	4
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	**1**	**4**	0	**5**	0	0	0	0	0	**5**
Total Volume	0	0	0	0	0	0	3	0	0	3	0	1	11	0	12	0	0	0	0	0	15
% App. Total	0	0	0	0		0	100	0	0		0	8.3	91.7	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.000	.250	.688	.000	.600	.000	.000	.000	.000	.000	.750

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E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 C
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	4	0	6
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
07:30 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
07:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	6	2	10
Total	0	0	0	0	0	0	1	0	0	2	0	1	0	1	1	0	0	0	12	2	20
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7
08:15 AM	0	0	0	3	2	0	0	0	0	3	0	0	0	1	2	0	0	0	17	0	28
08:30 AM	0	0	0	3	0	0	0	0	0	1	1	0	0	0	1	0	0	0	11	1	18
08:45 AM	0	0	0	3	0	0	1	0	0	9	0	0	0	0	2	0	0	0	12	2	29
Total	0	0	0	9	2	0	1	0	0	13	1	0	0	1	5	0	0	0	47	3	82
Grand Total	0	0	0	9	2	0	2	0	0	15	1	1	0	2	6	0	0	0	59	5	102
Apprch %	0	0	0	81.8	18.2	0	11.8	0	0	88.2	10	10	0	20	60	0	0	0	92.2	7.8	
Total %	0	0	0	8.8	2	0	2	0	0	14.7	1	1	0	2	5.9	0	0	0	57.8	4.9	

	Friendship Street From North						Richmond Street From East						Friendship Street From South						Richmond Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	7
08:15 AM	0	0	0	**3**	**2**	**5**	0	0	0	0	3	3	0	0	0	**1**	**2**	**3**	0	0	0	**17**	0	**17**	28
08:30 AM	0	0	0	3	0	3	0	0	0	0	1	1	**1**	0	0	0	1	2	0	0	0	11	1	12	18
08:45 AM	0	0	0	3	0	3	0	**1**	0	0	**9**	**10**	0	0	0	0	2	2	0	0	0	12	**2**	14	**29**
Total Volume	0	0	0	9	2	11	0	1	0	0	13	14	1	0	0	1	5	7	0	0	0	47	3	50	82
% App. Total	0	0	0	81.8	18.2		0	7.1	0	0	92.9		14.3	0	0	14.3	71.4		0	0	0	94	6		
PHF	.000	.000	.000	.750	.250	.550	.000	.250	.000	.000	.361	.350	.250	.000	.000	.250	.625	.583	.000	.000	.000	.691	.375	.735	.707

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N/S: Friendship Street
E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 C
Site Code : 83460.14
Start Date : 11/17/2015
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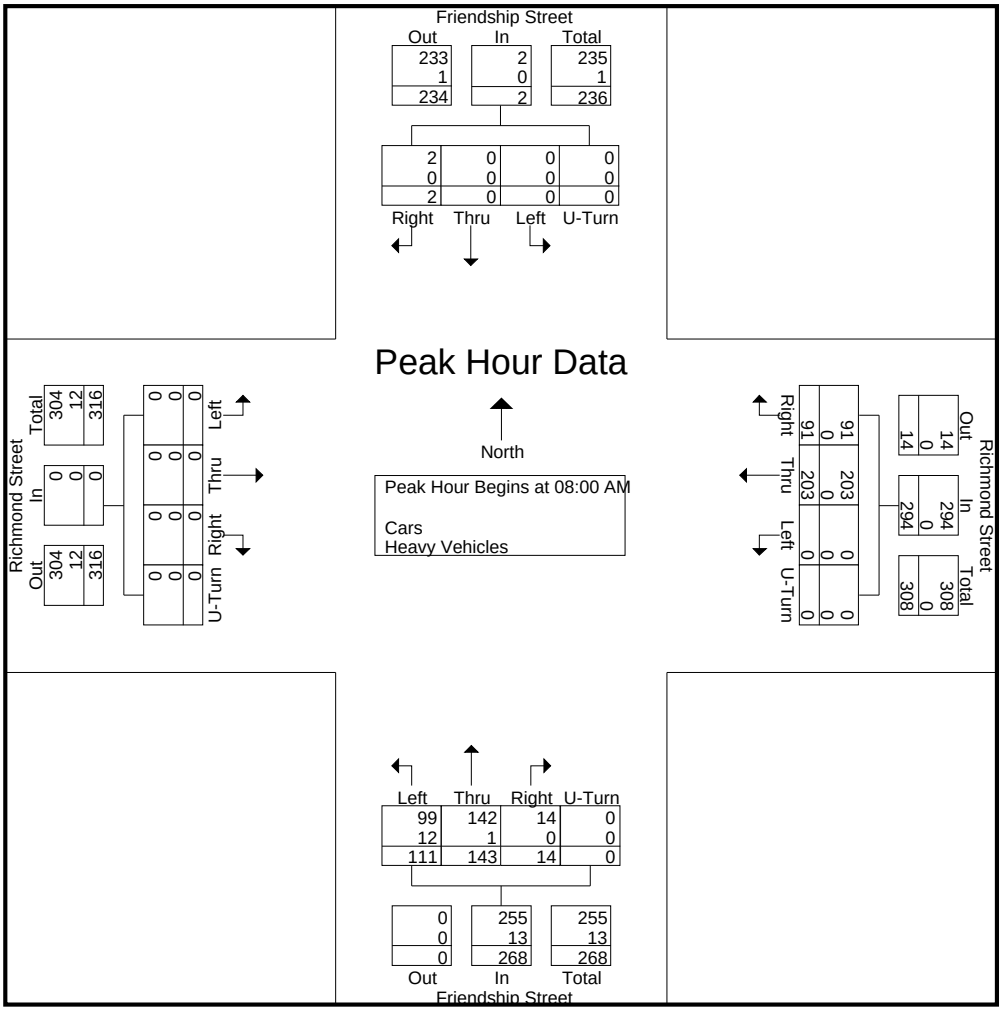
	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	**1**	0	0	0	**1**	5	47	0	0	52	3	32	26	0	61	0	0	0	0	0	114
08:15 AM	1	0	0	0	1	22	**60**	0	0	**82**	3	26	25	0	54	0	0	0	0	0	137
08:30 AM	0	0	0	0	0	25	53	0	0	78	**5**	**47**	22	0	74	0	0	0	0	0	152
08:45 AM	0	0	0	0	0	**39**	43	0	0	82	3	38	**38**	0	**79**	0	0	0	0	0	**161**
Total Volume	2	0	0	0	2	91	203	0	0	294	14	143	111	0	268	0	0	0	0	0	564
% App. Total	100	0	0	0		31	69	0	0		5.2	53.4	41.4	0		0	0	0	0		
PHF	.500	.000	.000	.000	.500	.583	.846	.000	.000	.896	.700	.761	.730	.000	.848	.000	.000	.000	.000	.000	.876
Cars	2	0	0	0	2	91	203	0	0	294	14	142	99	0	255	0	0	0	0	0	551
% Cars	100	0	0	0	100	100	100	0	0	100	100	99.3	89.2	0	95.1	0	0	0	0	0	97.7
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	1	12	0	13	0	0	0	0	0	13
% Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	0	0.7	10.8	0	4.9	0	0	0	0	0	2.3



N/S: Friendship Street
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City, State: Providence, RI
Client: VHB/ K. Caouette

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File Name : 154800 CC
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	17	26	0	0	7	25	11	0	0	0	0	0	86
04:15 PM	0	0	0	0	17	41	0	0	4	25	8	0	0	0	0	0	95
04:30 PM	0	0	0	0	32	53	0	0	4	34	13	0	0	0	0	0	136
04:45 PM	0	0	0	0	11	32	0	0	2	21	11	0	0	0	0	0	77
Total	0	0	0	0	77	152	0	0	17	105	43	0	0	0	0	0	394
05:00 PM	0	0	0	0	15	28	0	0	4	27	12	0	0	0	0	0	86
05:15 PM	0	0	0	0	18	30	0	0	1	19	18	0	0	0	0	0	86
05:30 PM	0	0	0	0	9	35	0	0	2	19	17	0	0	0	0	0	82
05:45 PM	0	0	0	0	11	24	0	0	4	20	23	0	0	0	0	0	82
Total	0	0	0	0	53	117	0	0	11	85	70	0	0	0	0	0	336
Grand Total	0	0	0	0	130	269	0	0	28	190	113	0	0	0	0	0	730
Apprch %	0	0	0	0	32.6	67.4	0	0	8.5	57.4	34.1	0	0	0	0	0	
Total %	0	0	0	0	17.8	36.8	0	0	3.8	26	15.5	0	0	0	0	0	
Cars	0	0	0	0	127	262	0	0	28	187	97	0	0	0	0	0	701
% Cars	0	0	0	0	97.7	97.4	0	0	100	98.4	85.8	0	0	0	0	0	96
Heavy Vehicles	0	0	0	0	3	7	0	0	0	3	16	0	0	0	0	0	29
% Heavy Vehicles	0	0	0	0	2.3	2.6	0	0	0	1.6	14.2	0	0	0	0	0	4

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	17	26	0	0	43	**7**	25	11	0	43	0	0	0	0	0	86
04:15 PM	0	0	0	0	0	17	41	0	0	58	4	25	8	0	37	0	0	0	0	0	95
04:30 PM	0	0	0	0	0	**32**	**53**	0	0	**85**	4	**34**	**13**	0	**51**	0	0	0	0	0	**136**
04:45 PM	0	0	0	0	0	11	32	0	0	43	2	21	11	0	34	0	0	0	0	0	77
Total Volume	0	0	0	0	0	77	152	0	0	229	17	105	43	0	165	0	0	0	0	0	394
% App. Total	0	0	0	0		33.6	66.4	0	0		10.3	63.6	26.1	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.602	.717	.000	.000	.674	.607	.772	.827	.000	.809	.000	.000	.000	.000	.000	.724
Cars	0	0	0	0	0	75	147	0	0	222	17	104	30	0	151	0	0	0	0	0	373
% Cars	0	0	0	0	0	97.4	96.7	0	0	96.9	100	99.0	69.8	0	91.5	0	0	0	0	0	94.7
Heavy Vehicles	0	0	0	0	0	2	5	0	0	7	0	1	13	0	14	0	0	0	0	0	21
% Heavy Vehicles	0	0	0	0	0	2.6	3.3	0	0	3.1	0	1.0	30.2	0	8.5	0	0	0	0	0	5.3

N/S: Friendship Street
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Groups Printed- Cars

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	15	26	0	0	7	25	7	0	0	0	0	0	80
04:15 PM	0	0	0	0	17	40	0	0	4	25	5	0	0	0	0	0	91
04:30 PM	0	0	0	0	32	51	0	0	4	34	10	0	0	0	0	0	131
04:45 PM	0	0	0	0	11	30	0	0	2	20	8	0	0	0	0	0	71
Total	0	0	0	0	75	147	0	0	17	104	30	0	0	0	0	0	373
05:00 PM	0	0	0	0	15	27	0	0	4	25	11	0	0	0	0	0	82
05:15 PM	0	0	0	0	17	30	0	0	1	19	17	0	0	0	0	0	84
05:30 PM	0	0	0	0	9	34	0	0	2	19	16	0	0	0	0	0	80
05:45 PM	0	0	0	0	11	24	0	0	4	20	23	0	0	0	0	0	82
Total	0	0	0	0	52	115	0	0	11	83	67	0	0	0	0	0	328
Grand Total	0	0	0	0	127	262	0	0	28	187	97	0	0	0	0	0	701
Apprch %	0	0	0	0	32.6	67.4	0	0	9	59.9	31.1	0	0	0	0	0	
Total %	0	0	0	0	18.1	37.4	0	0	4	26.7	13.8	0	0	0	0	0	

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	0	0	0	0	0	17	40	0	0	57	**4**	25	5	0	34	0	0	0	0	0	91
04:30 PM	0	0	0	0	0	**32**	**51**	0	0	**83**	4	**34**	10	0	**48**	0	0	0	0	0	**131**
04:45 PM	0	0	0	0	0	11	30	0	0	41	2	20	8	0	30	0	0	0	0	0	71
05:00 PM	0	0	0	0	0	15	27	0	0	42	4	25	**11**	0	40	0	0	0	0	0	82
Total Volume	0	0	0	0	0	75	148	0	0	223	14	104	34	0	152	0	0	0	0	0	375
% App. Total	0	0	0	0		33.6	66.4	0	0		9.2	68.4	22.4	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.586	.725	.000	.000	.672	.875	.765	.773	.000	.792	.000	.000	.000	.000	.000	.716

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Groups Printed- Heavy Vehicles

	Friendship Street From North				Richmond Street From East				Friendship Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	0	0	0	0	2	0	0	0	0	0	4	0	0	0	0	0	6
04:15 PM	0	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	4
04:30 PM	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	0	5
04:45 PM	0	0	0	0	0	2	0	0	0	1	3	0	0	0	0	0	6
Total	0	0	0	0	2	5	0	0	0	1	13	0	0	0	0	0	21
05:00 PM	0	0	0	0	0	1	0	0	0	2	1	0	0	0	0	0	4
05:15 PM	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2
05:30 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	2
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	2	0	0	0	2	3	0	0	0	0	0	8
Grand Total	0	0	0	0	3	7	0	0	0	3	16	0	0	0	0	0	29
Apprch %	0	0	0	0	30	70	0	0	0	15.8	84.2	0	0	0	0	0	
Total %	0	0	0	0	10.3	24.1	0	0	0	10.3	55.2	0	0	0	0	0	

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	**2**	0	0	0	**2**	0	0	**4**	0	**4**	0	0	0	0	0	**6**
04:15 PM	0	0	0	0	0	0	1	0	0	1	0	0	3	0	3	0	0	0	0	0	4
04:30 PM	0	0	0	0	0	0	**2**	0	0	2	0	0	3	0	3	0	0	0	0	0	5
04:45 PM	0	0	0	0	0	0	2	0	0	2	0	**1**	3	0	4	0	0	0	0	0	6
Total Volume	0	0	0	0	0	2	5	0	0	7	0	1	13	0	14	0	0	0	0	0	21
% App. Total	0	0	0	0		28.6	71.4	0	0		0	7.1	92.9	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.250	.625	.000	.000	.875	.000	.250	.813	.000	.875	.000	.000	.000	.000	.000	.875

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N/S: Friendship Street
E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 CC
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	2	0	1	2	0	0	0	0	0	0	0	0	2	3	0	0	0	0	25	35
04:15 PM	0	0	0	2	4	0	0	0	0	0	0	0	0	2	2	0	0	0	3	17	30
04:30 PM	0	0	0	2	2	0	0	0	3	0	0	0	0	3	2	0	0	0	1	10	23
04:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	3	6
Total	0	2	0	5	8	0	2	0	3	0	0	0	0	7	8	0	0	0	4	55	94
05:00 PM	0	0	0	1	4	0	0	0	0	1	0	0	0	3	2	0	0	0	2	5	18
05:15 PM	0	0	0	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	14
05:30 PM	0	0	0	1	4	0	0	0	2	0	0	1	0	5	1	0	0	0	6	3	23
05:45 PM	0	0	0	1	4	0	0	0	3	0	0	0	0	0	0	0	0	0	3	2	13
Total	0	0	0	6	22	0	0	0	5	1	0	1	0	8	3	0	0	0	12	10	68
Grand Total	0	2	0	11	30	0	2	0	8	1	0	1	0	15	11	0	0	0	16	65	162
Apprch %	0	4.7	0	25.6	69.8	0	18.2	0	72.7	9.1	0	3.7	0	55.6	40.7	0	0	0	19.8	80.2	
Total %	0	1.2	0	6.8	18.5	0	1.2	0	4.9	0.6	0	0.6	0	9.3	6.8	0	0	0	9.9	40.1	

	Friendship Street From North						Richmond Street From East						Friendship Street From South						Richmond Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:00 PM																									
04:00 PM	0	**2**	0	1	2	5	0	0	0	0	0	0	0	0	0	2	**3**	**5**	0	0	0	0	**25**	**25**	**35**
04:15 PM	0	0	0	**2**	**4**	**6**	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0	**3**	17	20	30
04:30 PM	0	0	0	2	2	4	0	0	0	**3**	0	**3**	0	0	0	**3**	2	5	0	0	0	1	10	11	23
04:45 PM	0	0	0	0	0	0	0	**2**	0	0	0	2	0	0	0	0	1	1	0	0	0	0	3	3	6
Total Volume	0	2	0	5	8	15	0	2	0	3	0	5	0	0	0	7	8	15	0	0	0	4	55	59	94
% App. Total	0	13.3	0	33.3	53.3		0	40	0	60	0		0	0	0	46.7	53.3		0	0	0	6.8	93.2		
PHF	.000	.250	.000	.625	.500	.625	.000	.250	.000	.250	.000	.417	.000	.000	.000	.583	.667	.750	.000	.000	.000	.333	.550	.590	.671

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File Name : 154800 CC
Site Code : 83460.14
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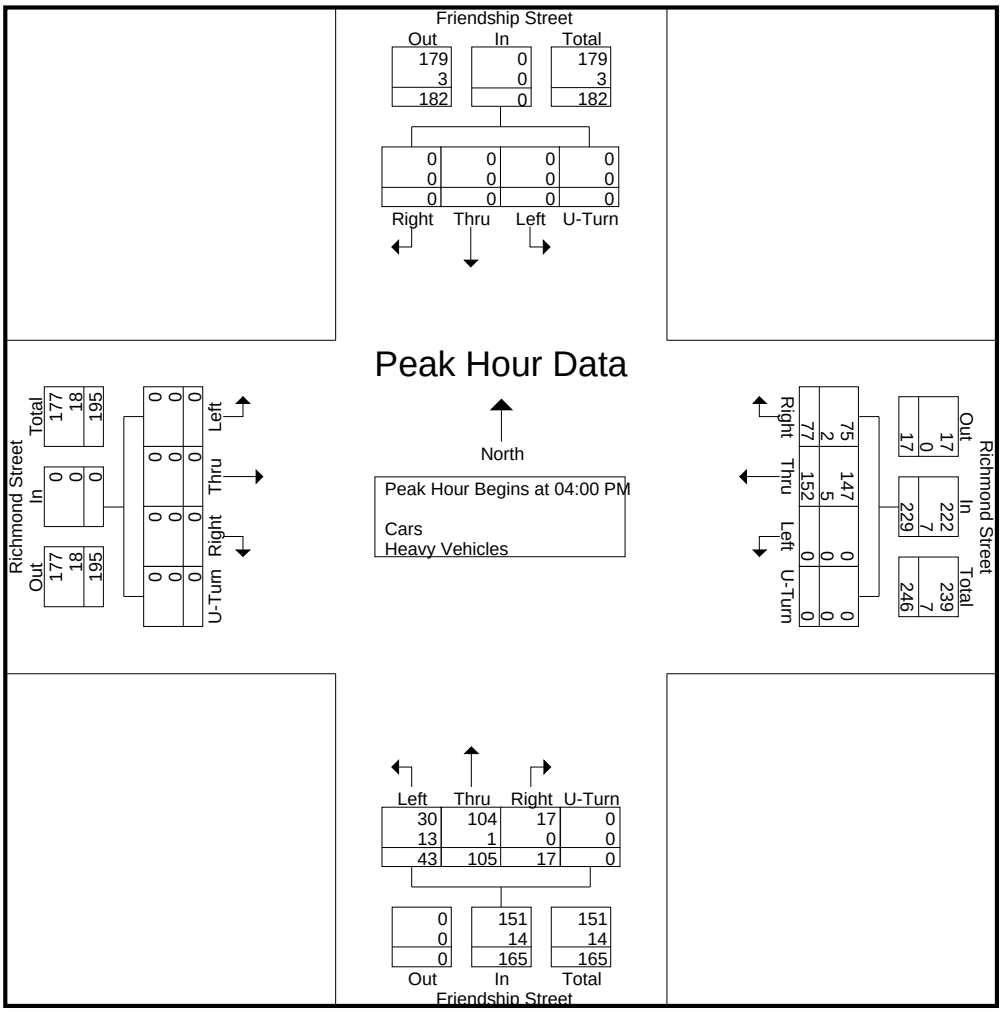
	Friendship Street From North					Richmond Street From East					Friendship Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	0	0	0	0	0	17	26	0	0	43	**7**	25	11	0	43	0	0	0	0	0	86
04:15 PM	0	0	0	0	0	17	41	0	0	58	4	25	8	0	37	0	0	0	0	0	95
04:30 PM	0	0	0	0	0	**32**	**53**	0	0	**85**	4	**34**	**13**	0	**51**	0	0	0	0	0	**136**
04:45 PM	0	0	0	0	0	11	32	0	0	43	2	21	11	0	34	0	0	0	0	0	77
Total Volume	0	0	0	0	0	77	152	0	0	229	17	105	43	0	165	0	0	0	0	0	394
% App. Total	0	0	0	0		33.6	66.4	0	0		10.3	63.6	26.1	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.602	.717	.000	.000	.674	.607	.772	.827	.000	.809	.000	.000	.000	.000	.000	.724
Cars	0	0	0	0	0	75	147	0	0	222	17	104	30	0	151	0	0	0	0	0	373
% Cars	0	0	0	0	0	97.4	96.7	0	0	96.9	100	99.0	69.8	0	91.5	0	0	0	0	0	94.7
Heavy Vehicles	0	0	0	0	0	2	5	0	0	7	0	1	13	0	14	0	0	0	0	0	21
% Heavy Vehicles	0	0	0	0	0	2.6	3.3	0	0	3.1	0	1.0	30.2	0	8.5	0	0	0	0	0	5.3



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Client: VHB/ K. Caouette

File Name : 154800 D
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	9	1	0	0	11	1	0	0	0	0	0	1	1	0	0	25
07:15 AM	4	8	0	0	0	17	0	0	0	0	0	0	0	1	0	0	30
07:30 AM	5	14	1	0	0	31	2	0	0	0	0	0	0	1	0	0	54
07:45 AM	9	17	2	0	0	28	2	0	0	0	0	0	1	2	0	0	61
Total	19	48	4	0	0	87	5	0	0	0	0	0	2	5	0	0	170
08:00 AM	15	14	2	0	0	41	1	0	0	0	0	0	2	1	0	0	76
08:15 AM	33	30	1	0	0	50	1	0	0	0	0	0	0	3	0	0	118
08:30 AM	26	32	1	0	0	54	3	0	0	0	0	0	1	3	0	0	120
08:45 AM	38	30	4	0	0	44	6	0	0	0	0	0	0	3	0	0	125
Total	112	106	8	0	0	189	11	0	0	0	0	0	3	10	0	0	439
Grand Total	131	154	12	0	0	276	16	0	0	0	0	0	5	15	0	0	609
Apprch %	44.1	51.9	4	0	0	94.5	5.5	0	0	0	0	0	25	75	0	0	
Total %	21.5	25.3	2	0	0	45.3	2.6	0	0	0	0	0	0.8	2.5	0	0	
Cars	129	146	10	0	0	273	14	0	0	0	0	0	5	15	0	0	592
% Cars	98.5	94.8	83.3	0	0	98.9	87.5	0	0	0	0	0	100	100	0	0	97.2
Heavy Vehicles	2	8	2	0	0	3	2	0	0	0	0	0	0	0	0	0	17
% Heavy Vehicles	1.5	5.2	16.7	0	0	1.1	12.5	0	0	0	0	0	0	0	0	0	2.8

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	15	14	2	0	31	0	41	1	0	42	0	0	0	0	0	**2**	1	0	0	3	76
08:15 AM	33	30	1	0	64	0	50	1	0	51	0	0	0	0	0	0	**3**	0	0	3	118
08:30 AM	26	**32**	1	0	59	0	**54**	3	0	**57**	0	0	0	0	0	1	3	0	0	**4**	120
08:45 AM	**38**	30	**4**	0	**72**	0	44	**6**	0	50	0	0	0	0	0	0	3	0	0	3	**125**
Total Volume	112	106	8	0	226	0	189	11	0	200	0	0	0	0	0	3	10	0	0	13	439
% App. Total	49.6	46.9	3.5	0		0	94.5	5.5	0		0	0	0	0		23.1	76.9	0	0		
PHF	.737	.828	.500	.000	.785	.000	.875	.458	.000	.877	.000	.000	.000	.000	.000	.375	.833	.000	.000	.813	.878
Cars	112	103	8	0	223	0	189	10	0	199	0	0	0	0	0	3	10	0	0	13	435
% Cars	100	97.2	100	0	98.7	0	100	90.9	0	99.5	0	0	0	0	0	100	100	0	0	100	99.1
Heavy Vehicles	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	4
% Heavy Vehicles	0	2.8	0	0	1.3	0	0	9.1	0	0.5	0	0	0	0	0	0	0	0	0	0	0.9

N/S: Clifford Street
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Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	8	0	0	0	10	1	0	0	0	0	0	1	1	0	0	22
07:15 AM	3	7	0	0	0	17	0	0	0	0	0	0	0	1	0	0	28
07:30 AM	5	13	1	0	0	30	1	0	0	0	0	0	0	1	0	0	51
07:45 AM	8	15	1	0	0	27	2	0	0	0	0	0	1	2	0	0	56
Total	17	43	2	0	0	84	4	0	0	0	0	0	2	5	0	0	157
08:00 AM	15	13	2	0	0	41	1	0	0	0	0	0	2	1	0	0	75
08:15 AM	33	29	1	0	0	50	1	0	0	0	0	0	0	3	0	0	117
08:30 AM	26	31	1	0	0	54	2	0	0	0	0	0	1	3	0	0	118
08:45 AM	38	30	4	0	0	44	6	0	0	0	0	0	0	3	0	0	125
Total	112	103	8	0	0	189	10	0	0	0	0	0	3	10	0	0	435
Grand Total	129	146	10	0	0	273	14	0	0	0	0	0	5	15	0	0	592
Apprch %	45.3	51.2	3.5	0	0	95.1	4.9	0	0	0	0	0	25	75	0	0	
Total %	21.8	24.7	1.7	0	0	46.1	2.4	0	0	0	0	0	0.8	2.5	0	0	

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	15	13	2	0	30	0	41	1	0	42	0	0	0	0	0	**2**	1	0	0	3	75
08:15 AM	33	29	1	0	63	0	50	1	0	51	0	0	0	0	0	0	**3**	0	0	3	117
08:30 AM	26	**31**	1	0	58	0	**54**	2	0	**56**	0	0	0	0	0	1	3	0	0	**4**	118
08:45 AM	**38**	30	**4**	0	**72**	0	44	**6**	0	50	0	0	0	0	0	0	3	0	0	3	**125**
Total Volume	112	103	8	0	223	0	189	10	0	199	0	0	0	0	0	3	10	0	0	13	435
% App. Total	50.2	46.2	3.6	0		0	95	5	0		0	0	0	0		23.1	76.9	0	0		
PHF	.737	.831	.500	.000	.774	.000	.875	.417	.000	.888	.000	.000	.000	.000	.000	.375	.833	.000	.000	.813	.870

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Groups Printed- Heavy Vehicles

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
07:45 AM	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	5
Total	2	5	2	0	0	3	1	0	0	0	0	0	0	0	0	0	13
08:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
08:30 AM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
08:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4
Grand Total	2	8	2	0	0	3	2	0	0	0	0	0	0	0	0	0	17
Apprch %	16.7	66.7	16.7	0	0	60	40	0	0	0	0	0	0	0	0	0	
Total %	11.8	47.1	11.8	0	0	17.6	11.8	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	1	**1**	0	2	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	0	3
07:15 AM	**1**	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
07:30 AM	0	1	0	0	1	0	1	**1**	0	**2**	0	0	0	0	0	0	0	0	0	0	3
07:45 AM	1	**2**	1	0	**4**	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	**5**
Total Volume	2	5	2	0	9	0	3	1	0	4	0	0	0	0	0	0	0	0	0	0	13
% App. Total	22.2	55.6	22.2	0		0	75	25	0		0	0	0	0		0	0	0	0		
PHF	.500	.625	.500	.000	.563	.000	.750	.250	.000	.500	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.650

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Groups Printed- Peds and Bicycles

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	2
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	5
07:45 AM	0	0	0	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0	7
Total	0	0	0	4	1	0	1	0	3	0	0	0	0	0	1	0	0	0	4	0	14
08:00 AM	0	0	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	5
08:15 AM	0	1	0	1	5	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	10
08:30 AM	0	1	0	4	5	0	0	0	2	1	0	0	0	0	1	0	1	0	3	2	20
08:45 AM	0	1	0	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0	10
Total	0	3	0	8	14	0	0	0	5	3	0	0	0	0	2	0	1	0	6	3	45
Grand Total	0	3	0	12	15	0	1	0	8	3	0	0	0	0	3	0	1	0	10	3	59
Apprch %	0	10	0	40	50	0	8.3	0	66.7	25	0	0	0	0	100	0	7.1	0	71.4	21.4	
Total %	0	5.1	0	20.3	25.4	0	1.7	0	13.6	5.1	0	0	0	0	5.1	0	1.7	0	16.9	5.1	

	Clifford Street From North						Richmond Street From East						Clifford Street From South						Richmond Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 08:00 AM																									
08:00 AM	0	0	0	1	2	3	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	5
08:15 AM	0	**1**	0	1	**5**	7	0	0	0	0	**2**	2	0	0	0	0	**1**	**1**	0	0	0	0	0	0	10
08:30 AM	0	1	0	**4**	5	**10**	0	0	0	**2**	1	**3**	0	0	0	0	1	1	0	**1**	0	**3**	**2**	**6**	**20**
08:45 AM	0	1	0	2	2	5	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	3	0	3	10
Total Volume	0	3	0	8	14	25	0	0	0	5	3	8	0	0	0	0	2	2	0	1	0	6	3	10	45
% App. Total	0	12	0	32	56		0	0	0	62.5	37.5		0	0	0	0	100		0	10	0	60	30		
PHF	.000	.750	.000	.500	.700	.625	.000	.000	.000	.625	.375	.667	.000	.000	.000	.000	.500	.500	.000	.250	.000	.500	.375	.417	.563

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N/S: Clifford Street
E/W: Richmond Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 D
Site Code : 83460.14
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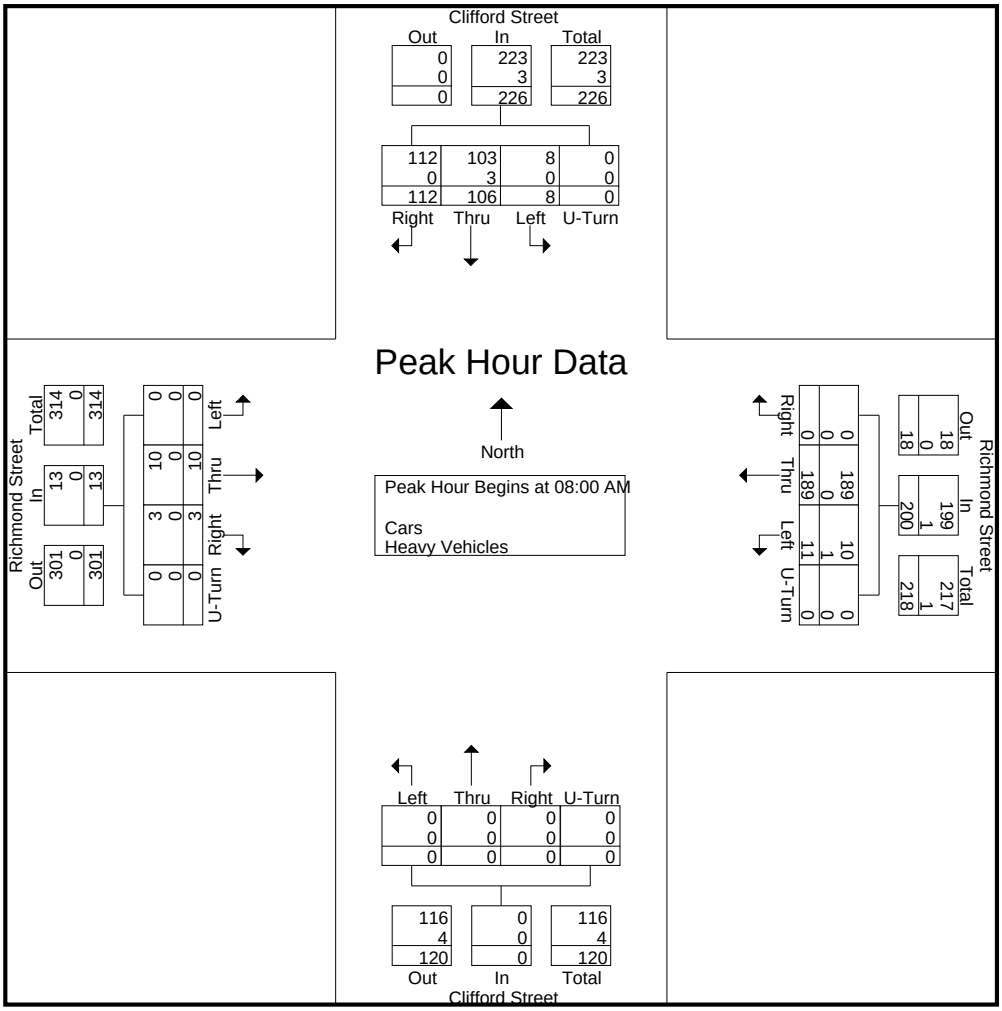
	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	15	14	2	0	31	0	41	1	0	42	0	0	0	0	0	**2**	1	0	0	3	76
08:15 AM	33	30	1	0	64	0	50	1	0	51	0	0	0	0	0	0	**3**	0	0	3	118
08:30 AM	26	**32**	1	0	59	0	**54**	3	0	**57**	0	0	0	0	0	1	3	0	0	**4**	120
08:45 AM	**38**	30	**4**	0	**72**	0	44	**6**	0	50	0	0	0	0	0	0	3	0	0	3	**125**
Total Volume	112	106	8	0	226	0	189	11	0	200	0	0	0	0	0	3	10	0	0	13	439
% App. Total	49.6	46.9	3.5	0		0	94.5	5.5	0		0	0	0	0		23.1	76.9	0	0		
PHF	.737	.828	.500	.000	.785	.000	.875	.458	.000	.877	.000	.000	.000	.000	.000	.375	.833	.000	.000	.813	.878
Cars	112	103	8	0	223	0	189	10	0	199	0	0	0	0	0	3	10	0	0	13	435
% Cars	100	97.2	100	0	98.7	0	100	90.9	0	99.5	0	0	0	0	0	100	100	0	0	100	99.1
Heavy Vehicles	0	3	0	0	3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	4
% Heavy Vehicles	0	2.8	0	0	1.3	0	0	9.1	0	0.5	0	0	0	0	0	0	0	0	0	0	0.9



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File Name : 154800 DD
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	15	47	5	0	0	31	10	0	0	0	0	0	3	4	0	0	115
04:15 PM	18	53	8	0	0	39	7	0	0	0	0	0	2	3	0	0	130
04:30 PM	36	111	16	0	0	48	14	0	0	0	0	0	2	0	0	0	227
04:45 PM	7	69	5	0	0	37	11	0	0	0	0	0	0	2	0	0	131
Total	76	280	34	0	0	155	42	0	0	0	0	0	7	9	0	0	603
05:00 PM	6	80	2	0	0	37	9	0	0	0	0	0	0	4	0	0	138
05:15 PM	11	59	2	0	0	41	11	0	0	0	0	0	0	1	0	0	125
05:30 PM	6	54	1	0	0	36	10	0	0	0	0	0	1	1	0	0	109
05:45 PM	4	43	3	0	0	31	5	0	0	0	0	0	1	3	0	0	90
Total	27	236	8	0	0	145	35	0	0	0	0	0	2	9	0	0	462
Grand Total	103	516	42	0	0	300	77	0	0	0	0	0	9	18	0	0	1065
Apprch %	15.6	78.1	6.4	0	0	79.6	20.4	0	0	0	0	0	33.3	66.7	0	0	
Total %	9.7	48.5	3.9	0	0	28.2	7.2	0	0	0	0	0	0.8	1.7	0	0	
Cars	102	510	42	0	0	294	70	0	0	0	0	0	9	18	0	0	1045
% Cars	99	98.8	100	0	0	98	90.9	0	0	0	0	0	100	100	0	0	98.1
Heavy Vehicles	1	6	0	0	0	6	7	0	0	0	0	0	0	0	0	0	20
% Heavy Vehicles	1	1.2	0	0	0	2	9.1	0	0	0	0	0	0	0	0	0	1.9

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	18	53	8	0	79	0	39	7	0	46	0	0	0	0	0	**2**	3	0	0	**5**	130
04:30 PM	**36**	**111**	**16**	0	**163**	0	**48**	**14**	0	**62**	0	0	0	0	0	2	0	0	0	2	**227**
04:45 PM	7	69	5	0	81	0	37	11	0	48	0	0	0	0	0	0	2	0	0	2	131
05:00 PM	6	80	2	0	88	0	37	9	0	46	0	0	0	0	0	0	**4**	0	0	4	138
Total Volume	67	313	31	0	411	0	161	41	0	202	0	0	0	0	0	4	9	0	0	13	626
% App. Total	16.3	76.2	7.5	0		0	79.7	20.3	0		0	0	0	0		30.8	69.2	0	0		
PHF	.465	.705	.484	.000	.630	.000	.839	.732	.000	.815	.000	.000	.000	.000	.000	.500	.563	.000	.000	.650	.689
Cars	67	310	31	0	408	0	157	38	0	195	0	0	0	0	0	4	9	0	0	13	616
% Cars	100	99.0	100	0	99.3	0	97.5	92.7	0	96.5	0	0	0	0	0	100	100	0	0	100	98.4
Heavy Vehicles	0	3	0	0	3	0	4	3	0	7	0	0	0	0	0	0	0	0	0	0	10
% Heavy Vehicles	0	1.0	0	0	0.7	0	2.5	7.3	0	3.5	0	0	0	0	0	0	0	0	0	0	1.6

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Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	14	47	5	0	0	30	9	0	0	0	0	0	3	4	0	0	112
04:15 PM	18	52	8	0	0	38	6	0	0	0	0	0	2	3	0	0	127
04:30 PM	36	110	16	0	0	46	14	0	0	0	0	0	2	0	0	0	224
04:45 PM	7	68	5	0	0	36	11	0	0	0	0	0	0	2	0	0	129
Total	75	277	34	0	0	150	40	0	0	0	0	0	7	9	0	0	592
05:00 PM	6	80	2	0	0	37	7	0	0	0	0	0	0	4	0	0	136
05:15 PM	11	58	2	0	0	41	11	0	0	0	0	0	0	1	0	0	124
05:30 PM	6	52	1	0	0	35	9	0	0	0	0	0	1	1	0	0	105
05:45 PM	4	43	3	0	0	31	3	0	0	0	0	0	1	3	0	0	88
Total	27	233	8	0	0	144	30	0	0	0	0	0	2	9	0	0	453
Grand Total	102	510	42	0	0	294	70	0	0	0	0	0	9	18	0	0	1045
Apprch %	15.6	78	6.4	0	0	80.8	19.2	0	0	0	0	0	33.3	66.7	0	0	
Total %	9.8	48.8	4	0	0	28.1	6.7	0	0	0	0	0	0.9	1.7	0	0	

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	18	52	8	0	78	0	38	6	0	44	0	0	0	0	0	**2**	3	0	0	**5**	127
04:30 PM	**36**	**110**	**16**	0	**162**	0	**46**	**14**	0	**60**	0	0	0	0	0	2	0	0	0	2	**224**
04:45 PM	7	68	5	0	80	0	36	11	0	47	0	0	0	0	0	0	2	0	0	2	129
05:00 PM	6	80	2	0	88	0	37	7	0	44	0	0	0	0	0	0	**4**	0	0	4	136
Total Volume	67	310	31	0	408	0	157	38	0	195	0	0	0	0	0	4	9	0	0	13	616
% App. Total	16.4	76	7.6	0		0	80.5	19.5	0		0	0	0	0		30.8	69.2	0	0		
PHF	.465	.705	.484	.000	.630	.000	.853	.679	.000	.813	.000	.000	.000	.000	.000	.500	.563	.000	.000	.650	.688

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File Name : 154800 DD
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Groups Printed- Heavy Vehicles

	Clifford Street From North				Richmond Street From East				Clifford Street From South				Richmond Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
04:15 PM	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total	1	3	0	0	0	5	2	0	0	0	0	0	0	0	0	0	11
05:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
05:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
05:30 PM	0	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	4
05:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2
Total	0	3	0	0	0	1	5	0	0	0	0	0	0	0	0	0	9
Grand Total	1	6	0	0	0	6	7	0	0	0	0	0	0	0	0	0	20
Apprch %	14.3	85.7	0	0	0	46.2	53.8	0	0	0	0	0	0	0	0	0	
Total %	5	30	0	0	0	30	35	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**1**	0	0	0	**1**	0	1	**1**	0	**2**	0	0	0	0	0	0	0	0	0	0	**3**
04:15 PM	0	**1**	0	0	1	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	3
04:30 PM	0	1	0	0	1	0	**2**	0	0	2	0	0	0	0	0	0	0	0	0	0	3
04:45 PM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Total Volume	1	3	0	0	4	0	5	2	0	7	0	0	0	0	0	0	0	0	0	0	11
% App. Total	25	75	0	0		0	71.4	28.6	0		0	0	0	0		0	0	0	0		
PHF	.250	.750	.000	.000	1.00	.000	.625	.500	.000	.875	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.917

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Groups Printed- Peds and Bicycles

	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
04:15 PM	0	0	0	1	1	0	0	0	1	0	0	0	0	3	1	0	0	0	1	1	9
04:30 PM	0	0	0	2	1	0	0	0	1	1	0	0	0	2	2	0	0	0	0	0	9
04:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1	1	0	0	0	0	4
Total	0	0	0	4	3	0	2	0	2	1	0	0	0	6	4	1	0	0	1	1	25
05:00 PM	0	0	0	1	3	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	6
05:15 PM	0	0	1	0	5	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	9
05:30 PM	0	0	0	0	3	0	0	0	1	0	0	0	0	2	1	0	0	0	0	0	7
05:45 PM	0	0	0	1	4	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	8
Total	0	0	1	2	15	0	0	0	1	3	0	0	0	5	2	0	0	0	0	1	30
Grand Total	0	0	1	6	18	0	2	0	3	4	0	0	0	11	6	1	0	0	1	2	55
Apprch %	0	0	4	24	72	0	22.2	0	33.3	44.4	0	0	0	64.7	35.3	25	0	0	25	50	
Total %	0	0	1.8	10.9	32.7	0	3.6	0	5.5	7.3	0	0	0	20	10.9	1.8	0	0	1.8	3.6	

	Clifford Street From North						Richmond Street From East						Clifford Street From South						Richmond Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 05:00 PM																									
05:00 PM	0	0	0	**1**	3	4	0	0	0	0	0	0	0	0	0	**2**	0	2	0	0	0	0	0	0	6
05:15 PM	0	0	**1**	0	**5**	**6**	0	0	0	0	**3**	**3**	0	0	0	0	0	0	0	0	0	0	0	0	**9**
05:30 PM	0	0	0	0	3	3	0	0	0	**1**	0	1	0	0	0	2	**1**	**3**	0	0	0	0	0	0	7
05:45 PM	0	0	0	1	4	5	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	**1**	**1**	8
Total Volume	0	0	1	2	15	18	0	0	0	1	3	4	0	0	0	5	2	7	0	0	0	0	1	1	30
% App. Total	0	0	5.6	11.1	83.3		0	0	0	25	75		0	0	0	71.4	28.6		0	0	0	0	100		
PHF	.000	.000	.250	.500	.750	.750	.000	.000	.000	.250	.250	.333	.000	.000	.000	.625	.500	.583	.000	.000	.000	.000	.250	.250	.833

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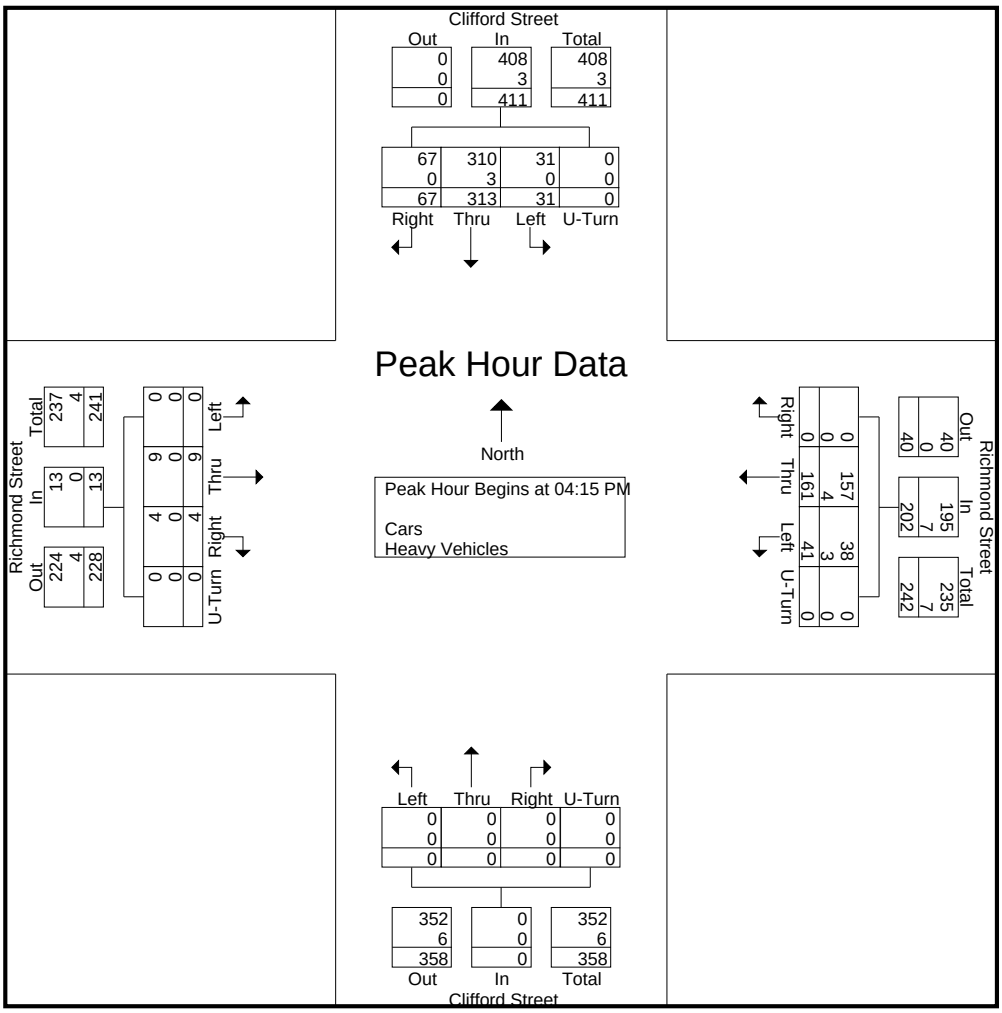
	Clifford Street From North					Richmond Street From East					Clifford Street From South					Richmond Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:15 PM																					
04:15 PM	18	53	8	0	79	0	39	7	0	46	0	0	0	0	0	**2**	3	0	0	**5**	130
04:30 PM	**36**	**111**	**16**	0	**163**	0	**48**	**14**	0	**62**	0	0	0	0	0	2	0	0	0	2	**227**
04:45 PM	7	69	5	0	81	0	37	11	0	48	0	0	0	0	0	0	2	0	0	2	131
05:00 PM	6	80	2	0	88	0	37	9	0	46	0	0	0	0	0	0	**4**	0	0	4	138
Total Volume	67	313	31	0	411	0	161	41	0	202	0	0	0	0	0	4	9	0	0	13	626
% App. Total	16.3	76.2	7.5	0		0	79.7	20.3	0		0	0	0	0		30.8	69.2	0	0		
PHF	.465	.705	.484	.000	.630	.000	.839	.732	.000	.815	.000	.000	.000	.000	.000	.500	.563	.000	.000	.650	.689
Cars	67	310	31	0	408	0	157	38	0	195	0	0	0	0	0	4	9	0	0	13	616
% Cars	100	99.0	100	0	99.3	0	97.5	92.7	0	96.5	0	0	0	0	0	100	100	0	0	100	98.4
Heavy Vehicles	0	3	0	0	3	0	4	3	0	7	0	0	0	0	0	0	0	0	0	0	10
% Heavy Vehicles	0	1.0	0	0	0.7	0	2.5	7.3	0	3.5	0	0	0	0	0	0	0	0	0	0	1.6



N/S: Clifford St/ Friendship St Bridge
E/W: East Franklin Street
City, State: Providence, RI
Client: VHB/ K. Caouette

PRECISION DATA INDUSTRIES, LLC
P.O. Box 301 Berlin, MA 01503
Office: 508.481.3999 Fax: 508.545.1234
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File Name : 154800 E
Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	5	6	0	0	0	112	98	0	0	0	0	0	0	0	0	0	221
07:15 AM	2	8	0	0	0	120	90	0	0	0	0	0	0	0	0	0	220
07:30 AM	7	18	0	0	0	104	91	0	0	0	0	0	0	0	0	0	220
07:45 AM	7	15	0	0	0	128	94	0	0	0	0	0	0	0	0	0	244
Total	21	47	0	0	0	464	373	0	0	0	0	0	0	0	0	0	905
08:00 AM	4	13	0	0	0	208	108	0	0	0	0	0	0	0	0	0	333
08:15 AM	6	27	0	0	0	223	87	0	0	0	0	0	0	0	0	0	343
08:30 AM	6	23	0	0	0	213	81	0	0	0	0	0	0	0	0	0	323
08:45 AM	4	25	0	0	0	186	84	0	0	0	0	0	0	0	0	0	299
Total	20	88	0	0	0	830	360	0	0	0	0	0	0	0	0	0	1298
Grand Total	41	135	0	0	0	1294	733	0	0	0	0	0	0	0	0	0	2203
Apprch %	23.3	76.7	0	0	0	63.8	36.2	0	0	0	0	0	0	0	0	0	
Total %	1.9	6.1	0	0	0	58.7	33.3	0	0	0	0	0	0	0	0	0	
Cars	34	105	0	0	0	1245	694	0	0	0	0	0	0	0	0	0	2078
% Cars	82.9	77.8	0	0	0	96.2	94.7	0	0	0	0	0	0	0	0	0	94.3
Heavy Vehicles	7	30	0	0	0	49	39	0	0	0	0	0	0	0	0	0	125
% Heavy Vehicles	17.1	22.2	0	0	0	3.8	5.3	0	0	0	0	0	0	0	0	0	5.7

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	4	13	0	0	17	0	208	**108**	0	**316**	0	0	0	0	0	0	0	0	0	0	333
08:15 AM	**6**	**27**	0	0	**33**	0	**223**	87	0	310	0	0	0	0	0	0	0	0	0	0	**343**
08:30 AM	6	23	0	0	29	0	213	81	0	294	0	0	0	0	0	0	0	0	0	0	323
08:45 AM	4	25	0	0	29	0	186	84	0	270	0	0	0	0	0	0	0	0	0	0	299
Total Volume	20	88	0	0	108	0	830	360	0	1190	0	0	0	0	0	0	0	0	0	0	1298
% App. Total	18.5	81.5	0	0		0	69.7	30.3	0		0	0	0	0		0	0	0	0		
PHF	.833	.815	.000	.000	.818	.000	.930	.833	.000	.941	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.946
Cars	18	72	0	0	90	0	801	338	0	1139	0	0	0	0	0	0	0	0	0	0	1229
% Cars	90.0	81.8	0	0	83.3	0	96.5	93.9	0	95.7	0	0	0	0	0	0	0	0	0	0	94.7
Heavy Vehicles	2	16	0	0	18	0	29	22	0	51	0	0	0	0	0	0	0	0	0	0	69
% Heavy Vehicles	10.0	18.2	0	0	16.7	0	3.5	6.1	0	4.3	0	0	0	0	0	0	0	0	0	0	5.3

N/S: Clifford St/ Friendship St Bridge
E/W: East Franklin Street
City, State: Providence, RI
Client: VHB/ K. Caouette

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File Name : 154800 E
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Cars

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	4	5	0	0	0	105	93	0	0	0	0	0	0	0	0	0	207
07:15 AM	2	5	0	0	0	113	86	0	0	0	0	0	0	0	0	0	206
07:30 AM	5	13	0	0	0	101	87	0	0	0	0	0	0	0	0	0	206
07:45 AM	5	10	0	0	0	125	90	0	0	0	0	0	0	0	0	0	230
Total	16	33	0	0	0	444	356	0	0	0	0	0	0	0	0	0	849
08:00 AM	4	10	0	0	0	204	100	0	0	0	0	0	0	0	0	0	318
08:15 AM	6	21	0	0	0	219	82	0	0	0	0	0	0	0	0	0	328
08:30 AM	4	18	0	0	0	205	78	0	0	0	0	0	0	0	0	0	305
08:45 AM	4	23	0	0	0	173	78	0	0	0	0	0	0	0	0	0	278
Total	18	72	0	0	0	801	338	0	0	0	0	0	0	0	0	0	1229
Grand Total	34	105	0	0	0	1245	694	0	0	0	0	0	0	0	0	0	2078
Apprch %	24.5	75.5	0	0	0	64.2	35.8	0	0	0	0	0	0	0	0	0	
Total %	1.6	5.1	0	0	0	59.9	33.4	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	4	10	0	0	14	0	204	**100**	0	**304**	0	0	0	0	0	0	0	0	0	0	318
08:15 AM	**6**	21	0	0	**27**	0	**219**	82	0	301	0	0	0	0	0	0	0	0	0	0	**328**
08:30 AM	4	18	0	0	22	0	205	78	0	283	0	0	0	0	0	0	0	0	0	0	305
08:45 AM	4	**23**	0	0	27	0	173	78	0	251	0	0	0	0	0	0	0	0	0	0	278
Total Volume	18	72	0	0	90	0	801	338	0	1139	0	0	0	0	0	0	0	0	0	0	1229
% App. Total	20	80	0	0		0	70.3	29.7	0		0	0	0	0		0	0	0	0		
PHF	.750	.783	.000	.000	.833	.000	.914	.845	.000	.937	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.937

N/S: Clifford St/ Friendship St Bridge
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Page No : 1

Groups Printed- Heavy Vehicles

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
07:00 AM	1	1	0	0	0	7	5	0	0	0	0	0	0	0	0	0	14
07:15 AM	0	3	0	0	0	7	4	0	0	0	0	0	0	0	0	0	14
07:30 AM	2	5	0	0	0	3	4	0	0	0	0	0	0	0	0	0	14
07:45 AM	2	5	0	0	0	3	4	0	0	0	0	0	0	0	0	0	14
Total	5	14	0	0	0	20	17	0	0	0	0	0	0	0	0	0	56
08:00 AM	0	3	0	0	0	4	8	0	0	0	0	0	0	0	0	0	15
08:15 AM	0	6	0	0	0	4	5	0	0	0	0	0	0	0	0	0	15
08:30 AM	2	5	0	0	0	8	3	0	0	0	0	0	0	0	0	0	18
08:45 AM	0	2	0	0	0	13	6	0	0	0	0	0	0	0	0	0	21
Total	2	16	0	0	0	29	22	0	0	0	0	0	0	0	0	0	69
Grand Total	7	30	0	0	0	49	39	0	0	0	0	0	0	0	0	0	125
Apprch %	18.9	81.1	0	0	0	55.7	44.3	0	0	0	0	0	0	0	0	0	
Total %	5.6	24	0	0	0	39.2	31.2	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	0	3	0	0	3	0	4	**8**	0	12	0	0	0	0	0	0	0	0	0	0	15
08:15 AM	0	**6**	0	0	6	0	4	5	0	9	0	0	0	0	0	0	0	0	0	0	15
08:30 AM	**2**	5	0	0	**7**	0	8	3	0	11	0	0	0	0	0	0	0	0	0	0	18
08:45 AM	0	2	0	0	2	0	**13**	6	0	**19**	0	0	0	0	0	0	0	0	0	0	**21**
Total Volume	2	16	0	0	18	0	29	22	0	51	0	0	0	0	0	0	0	0	0	0	69
% App. Total	11.1	88.9	0	0		0	56.9	43.1	0		0	0	0	0		0	0	0	0		
PHF	.250	.667	.000	.000	.643	.000	.558	.688	.000	.671	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.821

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E/W: East Franklin Street
City, State: Providence, RI
Client: VHB/ K. Caouette

File Name : 154800 E
Site Code : 83460.14
Start Date : 11/17/2015
Page No : 1

Groups Printed- Peds and Bicycles

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
07:00 AM	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	4
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	2	6
07:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
Total	0	0	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	14
08:00 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	3
08:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	10
08:30 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	5
08:45 AM	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	2	0	4
Total	0	1	0	5	2	0	0	0	0	1	0	0	0	0	0	0	0	0	13	0	22
Grand Total	0	1	0	9	4	0	0	0	0	1	0	0	0	0	0	0	0	0	19	2	36
Apprch %	0	7.1	0	64.3	28.6	0	0	0	0	100	0	0	0	0	0	0	0	0	90.5	9.5	
Total %	0	2.8	0	25	11.1	0	0	0	0	2.8	0	0	0	0	0	0	0	0	52.8	5.6	

	Clifford Street From North						East Franklin Street From East						Friendship Street Bridge From South						East Franklin Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 07:30 AM																									
07:30 AM	0	0	0	0	**1**	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	**2**	5	6
07:45 AM	0	0	0	**2**	0	**2**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	4
08:00 AM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	3
08:15 AM	0	**1**	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**8**	0	**8**	**10**
Total Volume	0	1	0	4	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	2	16	23
% App. Total	0	14.3	0	57.1	28.6		0	0	0	0	0		0	0	0	0	0		0	0	0	87.5	12.5		
PHF	.000	.250	.000	.500	.500	.875	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.438	.250	.500	.575

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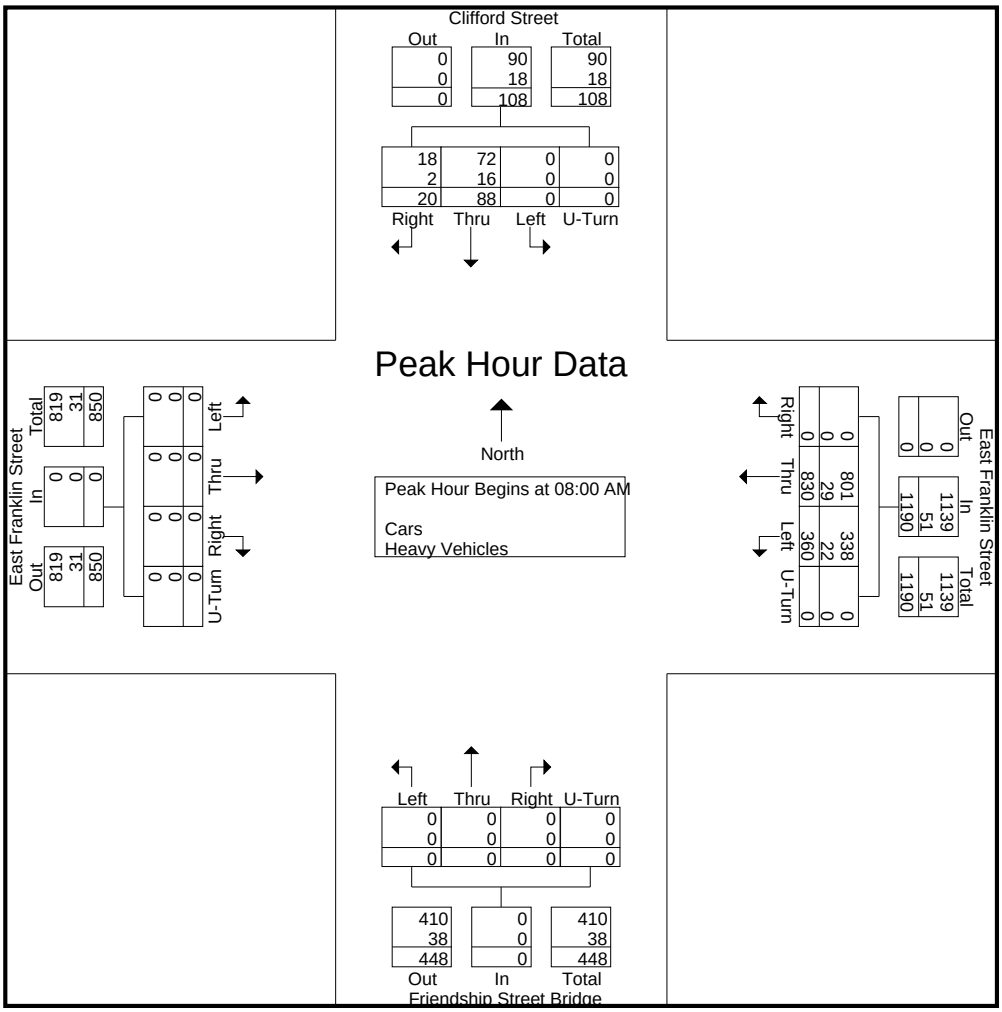
	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00 AM																					
08:00 AM	4	13	0	0	17	0	208	**108**	0	**316**	0	0	0	0	0	0	0	0	0	0	333
08:15 AM	**6**	**27**	0	0	**33**	0	**223**	87	0	310	0	0	0	0	0	0	0	0	0	0	**343**
08:30 AM	6	23	0	0	29	0	213	81	0	294	0	0	0	0	0	0	0	0	0	0	323
08:45 AM	4	25	0	0	29	0	186	84	0	270	0	0	0	0	0	0	0	0	0	0	299
Total Volume	20	88	0	0	108	0	830	360	0	1190	0	0	0	0	0	0	0	0	0	0	1298
% App. Total	18.5	81.5	0	0		0	69.7	30.3	0		0	0	0	0		0	0	0	0		
PHF	.833	.815	.000	.000	.818	.000	.930	.833	.000	.941	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.946
Cars	18	72	0	0	90	0	801	338	0	1139	0	0	0	0	0	0	0	0	0	0	1229
% Cars	90.0	81.8	0	0	83.3	0	96.5	93.9	0	95.7	0	0	0	0	0	0	0	0	0	0	94.7
Heavy Vehicles	2	16	0	0	18	0	29	22	0	51	0	0	0	0	0	0	0	0	0	0	69
% Heavy Vehicles	10.0	18.2	0	0	16.7	0	3.5	6.1	0	4.3	0	0	0	0	0	0	0	0	0	0	5.3



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Groups Printed- Cars - Heavy Vehicles

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	22	71	0	0	0	106	115	0	0	0	0	0	0	0	0	0	314
04:15 PM	23	67	0	0	0	114	113	0	0	0	0	0	0	0	0	0	317
04:30 PM	38	139	0	0	0	126	133	0	0	0	0	0	0	0	0	0	436
04:45 PM	18	87	0	0	0	117	123	0	0	0	0	0	0	0	0	0	345
Total	101	364	0	0	0	463	484	0	0	0	0	0	0	0	0	0	1412
05:00 PM	21	112	0	0	0	132	124	0	0	0	0	0	0	0	0	0	389
05:15 PM	25	84	0	0	0	153	131	0	0	0	0	0	0	0	0	0	393
05:30 PM	23	56	0	0	0	146	100	0	0	0	0	0	0	0	0	0	325
05:45 PM	12	53	0	0	0	145	94	0	0	0	0	0	0	0	0	0	304
Total	81	305	0	0	0	576	449	0	0	0	0	0	0	0	0	0	1411
Grand Total	182	669	0	0	0	1039	933	0	0	0	0	0	0	0	0	0	2823
Apprch %	21.4	78.6	0	0	0	52.7	47.3	0	0	0	0	0	0	0	0	0	
Total %	6.4	23.7	0	0	0	36.8	33	0	0	0	0	0	0	0	0	0	
Cars	166	653	0	0	0	1021	912	0	0	0	0	0	0	0	0	0	2752
% Cars	91.2	97.6	0	0	0	98.3	97.7	0	0	0	0	0	0	0	0	0	97.5
Heavy Vehicles	16	16	0	0	0	18	21	0	0	0	0	0	0	0	0	0	71
% Heavy Vehicles	8.8	2.4	0	0	0	1.7	2.3	0	0	0	0	0	0	0	0	0	2.5

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**38**	**139**	0	0	**177**	0	126	**133**	0	259	0	0	0	0	0	0	0	0	0	0	**436**
04:45 PM	18	87	0	0	105	0	117	123	0	240	0	0	0	0	0	0	0	0	0	0	345
05:00 PM	21	112	0	0	133	0	132	124	0	256	0	0	0	0	0	0	0	0	0	0	389
05:15 PM	25	84	0	0	109	0	**153**	131	0	**284**	0	0	0	0	0	0	0	0	0	0	393
Total Volume	102	422	0	0	524	0	528	511	0	1039	0	0	0	0	0	0	0	0	0	0	1563
% App. Total	19.5	80.5	0	0		0	50.8	49.2	0		0	0	0	0		0	0	0	0		
PHF	.671	.759	.000	.000	.740	.000	.863	.961	.000	.915	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.896
Cars	96	416	0	0	512	0	518	502	0	1020	0	0	0	0	0	0	0	0	0	0	1532
% Cars	94.1	98.6	0	0	97.7	0	98.1	98.2	0	98.2	0	0	0	0	0	0	0	0	0	0	98.0
Heavy Vehicles	6	6	0	0	12	0	10	9	0	19	0	0	0	0	0	0	0	0	0	0	31
% Heavy Vehicles	5.9	1.4	0	0	2.3	0	1.9	1.8	0	1.8	0	0	0	0	0	0	0	0	0	0	2.0

N/S: Clifford St/ Friendship St Bridge
E/W: East Franklin Street
City, State: Providence, RI
Client: VHB/ K. Caouette

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Site Code : 83460.14
Start Date : 11/17/2015
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Groups Printed- Cars

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	19	66	0	0	0	106	110	0	0	0	0	0	0	0	0	0	301
04:15 PM	21	64	0	0	0	112	111	0	0	0	0	0	0	0	0	0	308
04:30 PM	38	136	0	0	0	121	131	0	0	0	0	0	0	0	0	0	426
04:45 PM	16	85	0	0	0	114	121	0	0	0	0	0	0	0	0	0	336
Total	94	351	0	0	0	453	473	0	0	0	0	0	0	0	0	0	1371
05:00 PM	20	111	0	0	0	131	121	0	0	0	0	0	0	0	0	0	383
05:15 PM	22	84	0	0	0	152	129	0	0	0	0	0	0	0	0	0	387
05:30 PM	20	54	0	0	0	142	97	0	0	0	0	0	0	0	0	0	313
05:45 PM	10	53	0	0	0	143	92	0	0	0	0	0	0	0	0	0	298
Total	72	302	0	0	0	568	439	0	0	0	0	0	0	0	0	0	1381
Grand Total	166	653	0	0	0	1021	912	0	0	0	0	0	0	0	0	0	2752
Apprch %	20.3	79.7	0	0	0	52.8	47.2	0	0	0	0	0	0	0	0	0	
Total %	6	23.7	0	0	0	37.1	33.1	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**38**	**136**	0	0	**174**	0	121	**131**	0	252	0	0	0	0	0	0	0	0	0	0	**426**
04:45 PM	16	85	0	0	101	0	114	121	0	235	0	0	0	0	0	0	0	0	0	0	336
05:00 PM	20	111	0	0	131	0	131	121	0	252	0	0	0	0	0	0	0	0	0	0	383
05:15 PM	22	84	0	0	106	0	**152**	129	0	**281**	0	0	0	0	0	0	0	0	0	0	387
Total Volume	96	416	0	0	512	0	518	502	0	1020	0	0	0	0	0	0	0	0	0	0	1532
% App. Total	18.8	81.2	0	0		0	50.8	49.2	0		0	0	0	0		0	0	0	0		
PHF	.632	.765	.000	.000	.736	.000	.852	.958	.000	.907	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.899

N/S: Clifford St/ Friendship St Bridge
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Groups Printed- Heavy Vehicles

	Clifford Street From North				East Franklin Street From East				Friendship Street Bridge From South				East Franklin Street From West				
Start Time	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Right	Thru	Left	U-Turn	Int. Total
04:00 PM	3	5	0	0	0	0	5	0	0	0	0	0	0	0	0	0	13
04:15 PM	2	3	0	0	0	2	2	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	3	0	0	0	5	2	0	0	0	0	0	0	0	0	0	10
04:45 PM	2	2	0	0	0	3	2	0	0	0	0	0	0	0	0	0	9
Total	7	13	0	0	0	10	11	0	0	0	0	0	0	0	0	0	41
05:00 PM	1	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0	6
05:15 PM	3	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	6
05:30 PM	3	2	0	0	0	4	3	0	0	0	0	0	0	0	0	0	12
05:45 PM	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	6
Total	9	3	0	0	0	8	10	0	0	0	0	0	0	0	0	0	30
Grand Total	16	16	0	0	0	18	21	0	0	0	0	0	0	0	0	0	71
Apprch %	50	50	0	0	0	46.2	53.8	0	0	0	0	0	0	0	0	0	
Total %	22.5	22.5	0	0	0	25.4	29.6	0	0	0	0	0	0	0	0	0	

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:00 PM																					
04:00 PM	**3**	**5**	0	0	**8**	0	0	**5**	0	5	0	0	0	0	0	0	0	0	0	0	**13**
04:15 PM	2	3	0	0	5	0	2	2	0	4	0	0	0	0	0	0	0	0	0	0	9
04:30 PM	0	3	0	0	3	0	**5**	2	0	**7**	0	0	0	0	0	0	0	0	0	0	10
04:45 PM	2	2	0	0	4	0	3	2	0	5	0	0	0	0	0	0	0	0	0	0	9
Total Volume	7	13	0	0	20	0	10	11	0	21	0	0	0	0	0	0	0	0	0	0	41
% App. Total	35	65	0	0		0	47.6	52.4	0		0	0	0	0		0	0	0	0		
PHF	.583	.650	.000	.000	.625	.000	.500	.550	.000	.750	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.788

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Groups Printed- Peds and Bicycles

	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	Peds EB	Peds WB	Right	Thru	Left	Peds SB	Peds NB	Right	Thru	Left	Peds WB	Peds EB	Right	Thru	Left	Peds NB	Peds SB	Int. Total
04:00 PM	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	11
04:15 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
04:30 PM	0	0	0	0	0	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	0	0	0	0	0
Total	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	6	12
05:00 PM	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	6
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	3
05:30 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	5
05:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	14
Grand Total	0	0	0	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	3	12	26
Apprch %	0	0	0	36.4	63.6	0	0	0	0	0	0	0	0	0	0	0	0	0	20	80	
Total %	0	0	0	15.4	26.9	0	0	0	0	0	0	0	0	0	0	0	0	0	11.5	46.2	

	Clifford Street From North						East Franklin Street From East						Friendship Street Bridge From South						East Franklin Street From West						
Start Time	Right	Thru	Left	Peds EB	Peds WB	App. Total	Right	Thru	Left	Peds SB	Peds NB	App. Total	Right	Thru	Left	Peds WB	Peds EB	App. Total	Right	Thru	Left	Peds NB	Peds SB	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																									
Peak Hour for Entire Intersection Begins at 04:45 PM																									
04:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	**4**	**4**	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**	1	2	**6**
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	**3**	3
05:30 PM	0	0	0	**1**	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**3**	3	5
Total Volume	0	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6	8	14
% App. Total	0	0	0	16.7	83.3		0	0	0	0	0		0	0	0	0	0		0	0	0	25	75		
PHF	.000	.000	.000	.250	.313	.375	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.500	.500	.667	.583

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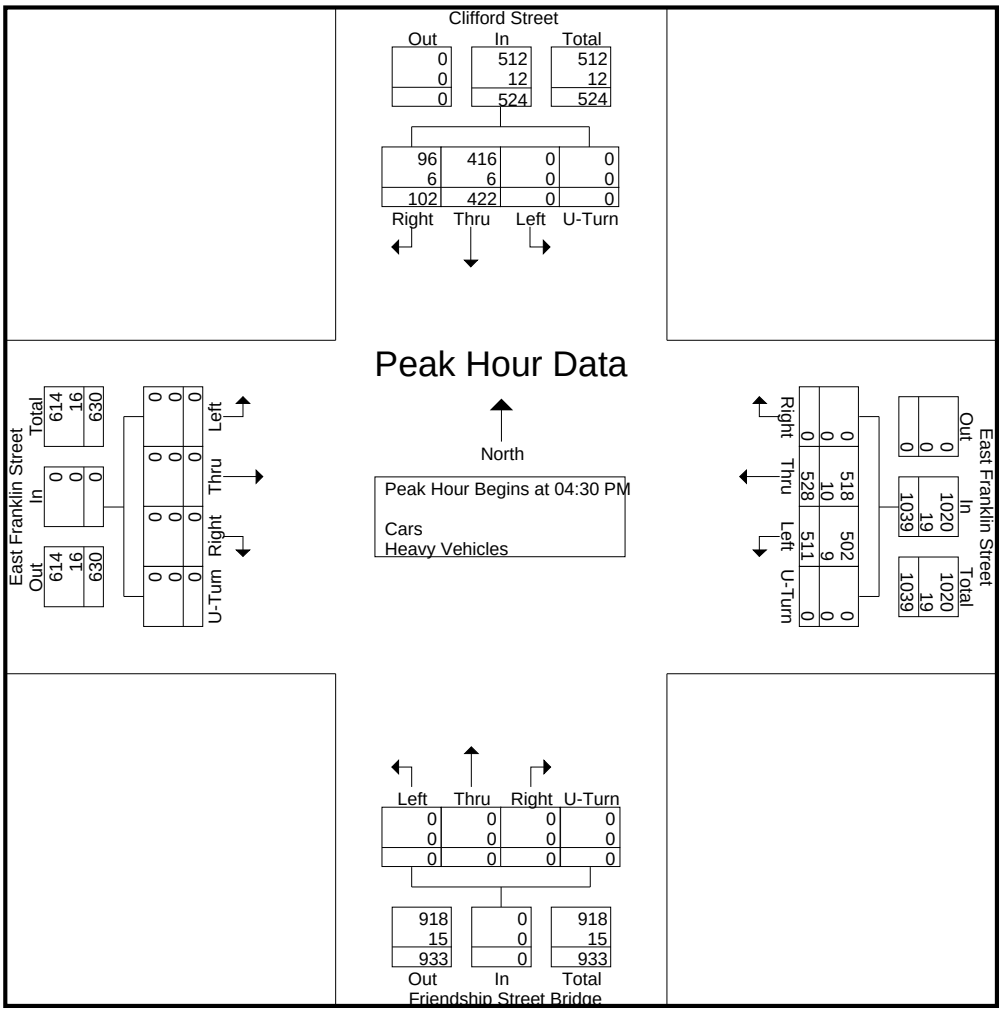
	Clifford Street From North					East Franklin Street From East					Friendship Street Bridge From South					East Franklin Street From West					
Start Time	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Right	Thru	Left	U-Turn	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	**38**	**139**	0	0	**177**	0	126	**133**	0	259	0	0	0	0	0	0	0	0	0	0	**436**
04:45 PM	18	87	0	0	105	0	117	123	0	240	0	0	0	0	0	0	0	0	0	0	345
05:00 PM	21	112	0	0	133	0	132	124	0	256	0	0	0	0	0	0	0	0	0	0	389
05:15 PM	25	84	0	0	109	0	**153**	131	0	**284**	0	0	0	0	0	0	0	0	0	0	393
Total Volume	102	422	0	0	524	0	528	511	0	1039	0	0	0	0	0	0	0	0	0	0	1563
% App. Total	19.5	80.5	0	0		0	50.8	49.2	0		0	0	0	0		0	0	0	0		
PHF	.671	.759	.000	.000	.740	.000	.863	.961	.000	.915	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.896
Cars	96	416	0	0	512	0	518	502	0	1020	0	0	0	0	0	0	0	0	0	0	1532
% Cars	94.1	98.6	0	0	97.7	0	98.1	98.2	0	98.2	0	0	0	0	0	0	0	0	0	0	98.0
Heavy Vehicles	6	6	0	0	12	0	10	9	0	19	0	0	0	0	0	0	0	0	0	0	31
% Heavy Vehicles	5.9	1.4	0	0	2.3	0	1.9	1.8	0	1.8	0	0	0	0	0	0	0	0	0	0	2.0



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Capacity Analysis

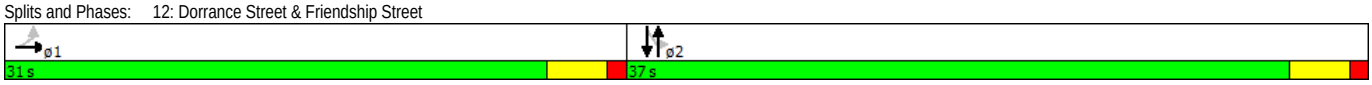
Signalized Capacity Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	70	115	0	0	0	0	145	30	20	195	0
Future Volume (vph)	50	70	115	0	0	0	0	145	30	20	195	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			170			235			251	
Travel Time (s)		18.3			3.9			5.3			5.7	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	280	0	0	0	0	0	265	0	0	262	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	31.0	31.0						37.0		37.0	37.0	
Total Split (%)	45.6%	45.6%						54.4%		54.4%	54.4%	
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.0						4.0			4.0	
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.34						0.37			0.41	
Control Delay		6.9						7.9			9.1	
Queue Delay		0.0						0.0			0.0	
Total Delay		6.9						8.0			9.1	
Queue Length 50th (ft)		17						24			26	
Queue Length 95th (ft)		59						41			59	
Internal Link Dist (ft)		725			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1604						1764			1616	
Starvation Cap Reductn		0						47			30	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.17						0.15			0.17	

Intersection Summary

Area Type: Other
Cycle Length: 68
Actuated Cycle Length: 26.3
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Dorrance Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	70	115	0	0	0	0	145	30	20	195	0
Future Volume (vph)	50	70	115	0	0	0	0	145	30	20	195	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.93						0.98			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1721						1802			1719	
Flt Permitted		0.99						1.00			0.96	
Satd. Flow (perm)		1721						1802			1651	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Adj. Flow (vph)	60	83	137	0	0	0	0	220	45	24	238	0
RTOR Reduction (vph)	0	59	0	0	0	0	0	13	0	0	0	0
Lane Group Flow (vph)	0	221	0	0	0	0	0	252	0	0	262	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		7.6						10.3			10.3	
Effective Green, g (s)		7.6						10.3			10.3	
Actuated g/C Ratio		0.29						0.40			0.40	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		505						716			656	
v/s Ratio Prot								0.14				
v/s Ratio Perm		0.13									c0.16	
v/c Ratio		0.44						0.35			0.40	
Uniform Delay, d1		7.4						5.5			5.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.4						0.2			0.3	
Delay (s)		7.8						5.7			5.8	
Level of Service		A						A			A	
Approach Delay (s)		7.8			0.0			5.7			5.8	
Approach LOS		A			A			A			A	

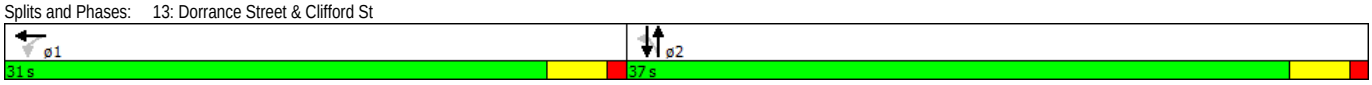
Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	25.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	180	70	75	160	0	0	125	155
Future Volume (vph)	0	0	0	5	180	70	75	160	0	0	125	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		756			178			222			235	
Travel Time (s)		17.2			4.0			5.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	327	0	0	291	0	0	329	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)				31.0	31.0		37.0	37.0			37.0	
Total Split (%)				45.6%	45.6%		54.4%	54.4%			54.4%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.48			0.52			0.47	
Control Delay					11.0			11.7			7.1	
Queue Delay					0.0			0.0			0.0	
Total Delay					11.0			11.7			7.1	
Queue Length 50th (ft)					34			30			19	
Queue Length 95th (ft)					90			82			65	
Internal Link Dist (ft)		676			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1545			1373			1535	
Starvation Cap Reductn					0			64			64	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.21			0.22			0.22	

Intersection Summary

Area Type: Other
Cycle Length: 68
Actuated Cycle Length: 32.6
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Dorrance Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	180	70	75	160	0	0	125	155
Future Volume (vph)	0	0	0	5	180	70	75	160	0	0	125	155
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.96			1.00			0.93	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					1810			1816			1643	
Flt Permitted					1.00			0.80			1.00	
Satd. Flow (perm)					1810			1478			1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	6	231	90	93	198	0	0	147	182
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	0	0	79	0
Lane Group Flow (vph)	0	0	0	0	306	0	0	291	0	0	250	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					11.9			12.2			12.2	
Effective Green, g (s)					11.9			12.2			12.2	
Actuated g/C Ratio					0.37			0.38			0.38	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					670			561			624	
v/s Ratio Prot											0.15	
v/s Ratio Perm					0.17			c0.20				
v/c Ratio					0.46			0.52			0.40	
Uniform Delay, d1					7.7			7.7			7.3	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.3			0.6			0.3	
Delay (s)					8.0			8.2			7.6	
Level of Service					A			A			A	
Approach Delay (s)		0.0			8.0			8.2			7.6	
Approach LOS		A			A			A			A	

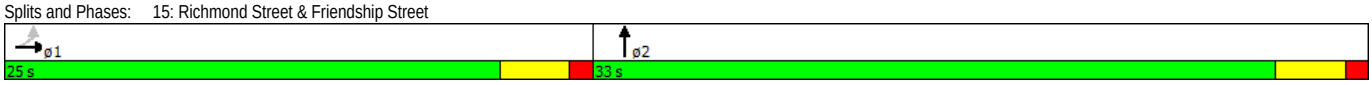
Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	32.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	145	15	0	0	0	0	205	95	0	0	0
Future Volume (vph)	115	145	15	0	0	0	0	205	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			805			257			215	
Travel Time (s)		11.4			18.3			5.8			4.9	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	324	0	0	0	0	0	334	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	25.0	25.0						33.0				
Total Split (%)	43.1%	43.1%						56.9%				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.24						0.53				
Control Delay		4.2						9.2				
Queue Delay		0.0						0.0				
Total Delay		4.2						9.2				
Queue Length 50th (ft)		7						27				
Queue Length 95th (ft)		21						57				
Internal Link Dist (ft)		422			725			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2652						1805				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.12						0.19				

Intersection Summary

Area Type: Other
Cycle Length: 58
Actuated Cycle Length: 26.9
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Richmond Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	145	15	0	0	0	0	205	95	0	0	0
Future Volume (vph)	115	145	15	0	0	0	0	205	95	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.96				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		3340						1819				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		3340						1819				
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	135	171	18	0	0	0	0	228	106	0	0	0
RTOR Reduction (vph)	0	91	0	0	0	0	0	39	0	0	0	0
Lane Group Flow (vph)	0	233	0	0	0	0	0	295	0	0	0	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		10.1						8.8				
Effective Green, g (s)		10.1						8.8				
Actuated g/C Ratio		0.38						0.33				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1254						595				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.07										
v/c Ratio		0.19						0.50				
Uniform Delay, d1		5.6						7.3				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.0						0.4				
Delay (s)		5.7						7.7				
Level of Service		A						A				
Approach Delay (s)		5.7			0.0			7.7			0.0	
Approach LOS		A			A			A			A	

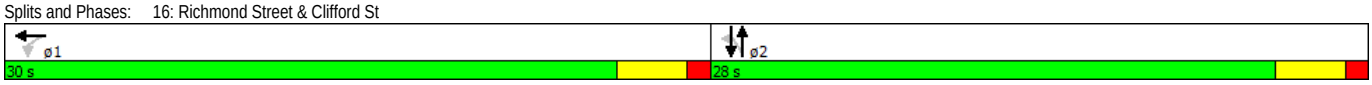
Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	26.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	10	110	115	10	190	0	0	10	5
Future Volume (vph)	0	0	0	10	110	115	10	190	0	0	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			756			449			257	
Travel Time (s)		11.2			17.2			10.2			5.8	
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	301	0	0	227	0	0	18	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)				30.0	30.0		28.0	28.0			28.0	
Total Split (%)				51.7%	51.7%		48.3%	48.3%			48.3%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.20			0.43			0.03	
Control Delay					3.5			10.1			5.3	
Queue Delay					0.0			0.0			0.0	
Total Delay					3.5			10.1			5.3	
Queue Length 50th (ft)					5			22			1	
Queue Length 95th (ft)					14			43			5	
Internal Link Dist (ft)		411			676			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					3031			1585			1549	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.10			0.14			0.01	

Intersection Summary

Area Type: Other
Cycle Length: 58
Actuated Cycle Length: 28.9
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Richmond Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	10	110	115	10	190	0	0	10	5
Future Volume (vph)	0	0	0	10	110	115	10	190	0	0	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					0.93			1.00			0.95	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					3305			1877			1814	
Flt Permitted					1.00			0.99			1.00	
Satd. Flow (perm)					3305			1858			1814	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	13	141	147	11	216	0	0	12	6
RTOR Reduction (vph)	0	0	0	0	83	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	0	0	0	218	0	0	227	0	0	14	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					12.5			8.2			8.2	
Effective Green, g (s)					12.5			8.2			8.2	
Actuated g/C Ratio					0.44			0.29			0.29	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1439			530			518	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.07			c0.12				
v/c Ratio					0.15			0.43			0.03	
Uniform Delay, d1					4.9			8.3			7.4	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.0			0.4			0.0	
Delay (s)					4.9			8.7			7.4	
Level of Service					A			A			A	
Approach Delay (s)		0.0			4.9			8.7			7.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	28.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	90	20	360	830	0	0	0	0
Future Volume (vph)	0	0	0	0	90	20	360	830	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	134	0	383	883	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)					21.0		54.0	54.0				
Total Split (%)					28.0%		72.0%	72.0%				
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.0		5.0	5.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.39		0.26	0.31				
Control Delay					28.7		0.7	2.4				
Queue Delay					0.0		0.0	0.0				
Total Delay					28.7		0.7	2.4				
Queue Length 50th (ft)					25		0	25				
Queue Length 95th (ft)					44		m13	m81				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					700		1476	2804				
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	0.31				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 506: Clifford St & East Franklin Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	90	20	360	830	0	0	0	0
Future Volume (vph)	0	0	0	0	90	20	360	830	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.97		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3194		1736	3471				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3194		1736	3471				
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	110	24	383	883	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	22	0	84	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	112	0	299	883	0	0	0	0
Confl. Peds. (#/hr)							2					
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					6.4		58.6	58.6				
Effective Green, g (s)					6.4		58.6	58.6				
Actuated g/C Ratio					0.09		0.78	0.78				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					272		1356	2712				
v/s Ratio Prot					c0.04		0.17	c0.25				
v/s Ratio Perm												
v/c Ratio					0.41		0.22	0.33				
Uniform Delay, d1					32.5		2.2	2.4				
Progression Factor					1.00		0.89	0.81				
Incremental Delay, d2					0.7		0.3	0.3				
Delay (s)					33.2		2.2	2.2				
Level of Service					C		A	A				
Approach Delay (s)		0.0			33.2			2.2			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	425	105	515	530	0	0	0	0
Future Volume (vph)	0	0	0	0	425	105	515	530	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	716	0	566	582	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)					21.0		54.0	54.0				
Total Split (%)					28.0%		72.0%	72.0%				
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.0		5.0	5.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.94		0.49	0.25				
Control Delay					50.4		5.7	4.5				
Queue Delay					0.0		0.0	0.0				
Total Delay					50.4		5.7	4.5				
Queue Length 50th (ft)					165		85	41				
Queue Length 95th (ft)					177		m98	m46				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					761		1166	2312				
Starvation Cap Reductn					0		0	0				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.94		0.49	0.25				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clifford St & East Franklin Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	0	425	105	515	530	0	0	0	0
Future Volume (vph)	0	0	0	0	425	105	515	530	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.97		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3434		1770	3539				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3434		1770	3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	574	142	566	582	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	29	0	10	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	687	0	556	582	0	0	0	0
Confl. Peds. (#/hr)							2					
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					16.0		49.0	49.0				
Effective Green, g (s)					16.0		49.0	49.0				
Actuated g/C Ratio					0.21		0.65	0.65				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					732		1156	2312				
v/s Ratio Prot					c0.20		c0.31	0.16				
v/s Ratio Perm												
v/c Ratio					0.94		0.48	0.25				
Uniform Delay, d1					29.0		6.6	5.4				
Progression Factor					1.00		0.75	0.79				
Incremental Delay, d2					19.5		0.8	0.1				
Delay (s)					48.5		5.8	4.4				
Level of Service					D		A	A				
Approach Delay (s)		0.0			48.5			5.1			0.0	
Approach LOS		A			D			A			A	

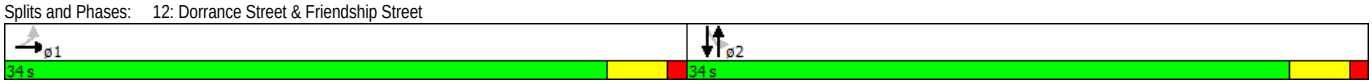
Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	110	80	0	0	0	0	115	15	25	215	0
Future Volume (vph)	55	110	80	0	0	0	0	115	15	25	215	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			170			235			251	
Travel Time (s)		18.3			3.9			5.3			5.7	
Peak Hour Factor	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	350	0	0	0	0	0	151	0	0	252	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	34.0	34.0						34.0		34.0	34.0	
Total Split (%)	50.0%	50.0%						50.0%		50.0%	50.0%	
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.0						4.0			4.0	
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.48						0.25			0.45	
Control Delay		9.0						8.1			10.9	
Queue Delay		0.0						0.0			0.0	
Total Delay		9.0						8.1			10.9	
Queue Length 50th (ft)		28						13			25	
Queue Length 95th (ft)		62						42			76	
Internal Link Dist (ft)		725			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1694						1713			1620	
Starvation Cap Reductn		0						41			27	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.21						0.09			0.16	

Intersection Summary

Area Type: Other
Cycle Length: 68
Actuated Cycle Length: 29.2
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Dorrance Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	110	80	0	0	0	0	115	15	25	215	0
Future Volume (vph)	55	110	80	0	0	0	0	115	15	25	215	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		1778						1799			1767	
Flt Permitted		0.99						1.00			0.96	
Satd. Flow (perm)		1778						1799			1702	
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	79	157	114	0	0	0	0	134	17	26	226	0
RTOR Reduction (vph)	0	28	0	0	0	0	0	8	0	0	0	0
Lane Group Flow (vph)	0	322	0	0	0	0	0	143	0	0	252	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		11.5						9.5			9.5	
Effective Green, g (s)		11.5						9.5			9.5	
Actuated g/C Ratio		0.40						0.33			0.33	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		705						589			557	
v/s Ratio Prot								0.08				
v/s Ratio Perm		0.18									c0.15	
v/c Ratio		0.46						0.24			0.45	
Uniform Delay, d1		6.4						7.1			7.7	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.3						0.1			0.4	
Delay (s)		6.8						7.3			8.1	
Level of Service		A						A			A	
Approach Delay (s)		6.8			0.0			7.3			8.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	29.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	200	20	10	110	0	0	215	95
Future Volume (vph)	0	0	0	5	200	20	10	110	0	0	215	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		756			178			222			235	
Travel Time (s)		17.2			4.0			5.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	262	0	0	151	0	0	356	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)				29.0	29.0		39.0	39.0			39.0	
Total Split (%)				42.6%	42.6%		57.4%	57.4%			57.4%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.39			0.24			0.54	
Control Delay					10.0			7.5			9.8	
Queue Delay					0.0			0.0			0.0	
Total Delay					10.0			7.5			9.8	
Queue Length 50th (ft)					24			14			31	
Queue Length 95th (ft)					80			36			81	
Internal Link Dist (ft)		676			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1571			1703			1693	
Starvation Cap Reductn					0			95			55	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.17			0.09			0.22	

Intersection Summary

Area Type: Other
Cycle Length: 68
Actuated Cycle Length: 30
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Dorrance Street & Clifford St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	5	200	20	10	110	0	0	215	95
Future Volume (vph)	0	0	0	5	200	20	10	110	0	0	215	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					1839			1819			1735	
Flt Permitted					1.00			0.96			1.00	
Satd. Flow (perm)					1839			1747			1735	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	6	233	23	12	138	0	0	247	109
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	30	0
Lane Group Flow (vph)	0	0	0	0	257	0	0	151	0	0	326	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					10.9			10.9			10.9	
Effective Green, g (s)					10.9			10.9			10.9	
Actuated g/C Ratio					0.37			0.37			0.37	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					672			639			634	
v/s Ratio Prot											c0.19	
v/s Ratio Perm					0.14			0.09				
v/c Ratio					0.38			0.24			0.51	
Uniform Delay, d1					7.0			6.6			7.4	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.2			0.1			0.5	
Delay (s)					7.2			6.7			7.9	
Level of Service					A			A			A	
Approach Delay (s)		0.0			7.2			6.7			7.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	29.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	105	10	0	0	0	0	145	80	0	0	0
Future Volume (vph)	55	105	10	0	0	0	0	145	80	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			805			257			215	
Travel Time (s)		11.4			18.3			5.8			4.9	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	210	0	0	0	0	0	352	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	24.0	24.0						34.0				
Total Split (%)	41.4%	41.4%						58.6%				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.17						0.55				
Control Delay		4.9						9.2				
Queue Delay		0.0						0.0				
Total Delay		4.9						9.2				
Queue Length 50th (ft)		5						28				
Queue Length 95th (ft)		17						36				
Internal Link Dist (ft)		422			725			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2552						1737				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.08						0.20				

Intersection Summary

Area Type: Other
Cycle Length: 58
Actuated Cycle Length: 27.4
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Richmond Street & Friendship Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	105	10	0	0	0	0	145	80	0	0	0
Future Volume (vph)	55	105	10	0	0	0	0	145	80	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.95				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		3292						1756				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		3292						1756				
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Adj. Flow (vph)	68	130	12	0	0	0	0	227	125	0	0	0
RTOR Reduction (vph)	0	50	0	0	0	0	0	47	0	0	0	0
Lane Group Flow (vph)	0	160	0	0	0	0	0	305	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		10.1						9.2				
Effective Green, g (s)		10.1						9.2				
Actuated g/C Ratio		0.37						0.34				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1217						591				
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.05										
v/c Ratio		0.13						0.52				
Uniform Delay, d1		5.7						7.3				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.0						0.5				
Delay (s)		5.7						7.8				
Level of Service		A						A				
Approach Delay (s)		5.7			0.0			7.8			0.0	
Approach LOS		A			A			A			A	

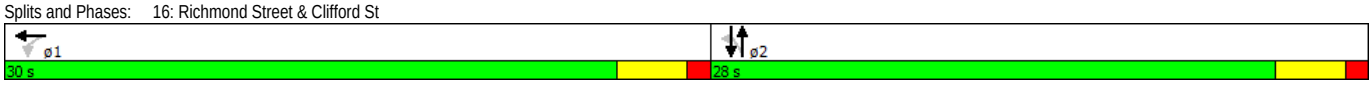
Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	27.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	25	320	60	45	165	0	0	10	5
Future Volume (vph)	0	0	0	25	320	60	45	165	0	0	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			756			449			257	
Travel Time (s)		11.2			17.2			10.2			5.8	
Peak Hour Factor	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	653	0	0	250	0	0	27	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)				30.0	30.0		28.0	28.0			28.0	
Total Split (%)				51.7%	51.7%		48.3%	48.3%			48.3%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.42			0.48			0.05	
Control Delay					7.1			12.2			6.6	
Queue Delay					0.0			0.0			0.0	
Total Delay					7.1			12.2			6.6	
Queue Length 50th (ft)					29			25			2	
Queue Length 95th (ft)					43			72			7	
Internal Link Dist (ft)		411			676			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					2913			1341			1404	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.22			0.19			0.02	

Intersection Summary

Area Type: Other
Cycle Length: 58
Actuated Cycle Length: 31.8
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Richmond Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	25	320	60	45	165	0	0	10	5
Future Volume (vph)	0	0	0	25	320	60	45	165	0	0	10	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					0.98			1.00			0.95	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3484			1843			1814	
Flt Permitted					1.00			0.93			1.00	
Satd. Flow (perm)					3484			1734			1814	
Peak-hour factor, PHF	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Adj. Flow (vph)	0	0	0	40	516	97	54	196	0	0	18	9
RTOR Reduction (vph)	0	0	0	0	24	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	0	0	0	629	0	0	250	0	0	21	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					14.1			9.5			9.5	
Effective Green, g (s)					14.1			9.5			9.5	
Actuated g/C Ratio					0.45			0.30			0.30	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1554			521			545	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.18			c0.14				
v/c Ratio					0.40			0.48			0.04	
Uniform Delay, d1					5.9			9.0			7.8	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.1			0.5			0.0	
Delay (s)					6.0			9.5			7.8	
Level of Service					A			A			A	
Approach Delay (s)		0.0			6.0			9.5			7.8	
Approach LOS		A			A			A			A	

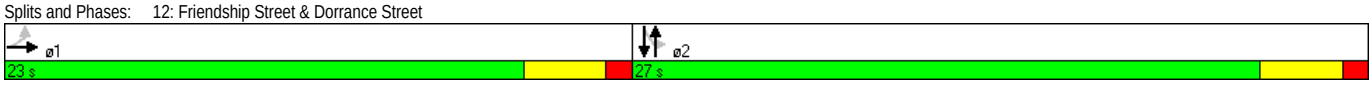
Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	31.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	72	117	0	0	0	0	149	28	17	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			170			235			251	
Travel Time (s)		18.3			3.9			5.3			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	282	0	0	0	0	0	268	0	0	262	0
Turn Type	Perm									Perm		
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	23.0	23.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	27.0	27.0	0.0
Total Split (%)	46.0%	46.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.0%	0.0%	54.0%	54.0%	0.0%
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.35						0.38			0.42	
Control Delay		6.4						7.9			9.1	
Queue Delay		0.0						0.0			0.0	
Total Delay		6.4						7.9			9.1	
Queue Length 50th (ft)		15						23			26	
Queue Length 95th (ft)		56						40			59	
Internal Link Dist (ft)		725			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1267						1497			1374	
Starvation Cap Reductn		0						54			38	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.22						0.19			0.20	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 26.8
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Friendship Street & Dorrance Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	72	117	0	0	0	0	149	28	17	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.93						0.98			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1721						1806			1720	
Flt Permitted		0.99						1.00			0.96	
Satd. Flow (perm)		1721						1806			1661	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Adj. Flow (vph)	57	86	139	0	0	0	0	226	42	21	241	0
RTOR Reduction (vph)	0	79	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	203	0	0	0	0	0	253	0	0	262	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Turn Type	Perm									Perm		
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		7.7						10.2			10.2	
Effective Green, g (s)		7.7						10.2			10.2	
Actuated g/C Ratio		0.30						0.39			0.39	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		512						711			654	
v/s Ratio Prot								0.14				
v/s Ratio Perm		0.12									c0.16	
v/c Ratio		0.40						0.36			0.40	
Uniform Delay, d1		7.2						5.5			5.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.3						0.2			0.3	
Delay (s)		7.6						5.7			5.9	
Level of Service		A						A			A	
Approach Delay (s)		7.6			0.0			5.7			5.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	25.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

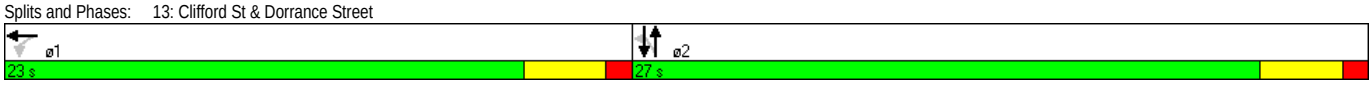
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	185	70	77	160	0	0	126	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		756			178			222			235	
Travel Time (s)		17.2			4.0			5.0			5.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	333	0	0	293	0	0	332	0
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)	0.0	0.0	0.0	23.0	23.0	0.0	27.0	27.0	0.0	0.0	27.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	46.0%	46.0%	0.0%	54.0%	54.0%	0.0%	0.0%	54.0%	0.0%
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.48			0.54			0.47	
Control Delay					10.5			12.3			6.4	
Queue Delay					0.0			0.0			0.0	
Total Delay					10.5			12.3			6.4	
Queue Length 50th (ft)					32			31			15	
Queue Length 95th (ft)					90			87			60	
Internal Link Dist (ft)		676			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1138			1100			1273	
Starvation Cap Reductn					0			64			65	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.29			0.28			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 32.5
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Clifford St & Dorrance Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	185	70	77	160	0	0	126	156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.96			1.00			0.93	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					1811			1815			1643	
Flt Permitted					1.00			0.80			1.00	
Satd. Flow (perm)					1811			1468			1643	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	6	237	90	95	198	0	0	148	184
RTOR Reduction (vph)	0	0	0	0	27	0	0	0	0	0	104	0
Lane Group Flow (vph)	0	0	0	0	306	0	0	293	0	0	228	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					12.1			12.0			12.0	
Effective Green, g (s)					12.1			12.0			12.0	
Actuated g/C Ratio					0.38			0.37			0.37	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					683			549			614	
v/s Ratio Prot											0.14	
v/s Ratio Perm					0.17			c0.20				
v/c Ratio					0.45			0.53			0.37	
Uniform Delay, d1					7.5			7.9			7.3	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.3			0.7			0.2	
Delay (s)					7.8			8.6			7.6	
Level of Service					A			A			A	
Approach Delay (s)		0.0			7.8			8.6			7.6	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	32.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.1%	ICU Level of Service	A
Analysis Period (min)	15		

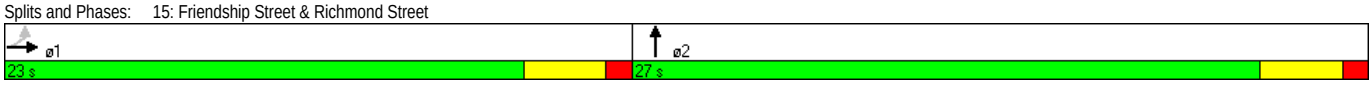
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	147	14	0	0	0	0	208	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			805			257			215	
Travel Time (s)		11.4			18.3			5.8			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	323	0	0	0	0	0	334	0	0	0	0
Turn Type	Perm											
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	23.0	23.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	0.0	0.0	0.0
Total Split (%)	46.0%	46.0%	0.0%	0.0%	0.0%	0.0%	0.0%	54.0%	0.0%	0.0%	0.0%	0.0%
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.24						0.53				
Control Delay		4.3						9.1				
Queue Delay		0.0						0.0				
Total Delay		4.3						9.1				
Queue Length 50th (ft)		7						27				
Queue Length 95th (ft)		23						57				
Internal Link Dist (ft)		422			725			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2369						1540				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.14						0.22				

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 27.5
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Friendship Street & Richmond Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	147	14	0	0	0	0	208	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.96				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		3343						1821				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		3343						1821				
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	134	173	16	0	0	0	0	231	103	0	0	0
RTOR Reduction (vph)	0	90	0	0	0	0	0	40	0	0	0	0
Lane Group Flow (vph)	0	233	0	0	0	0	0	294	0	0	0	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Perm											
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		10.5						9.0				
Effective Green, g (s)		10.5						9.0				
Actuated g/C Ratio		0.38						0.33				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1276						596				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.07										
v/c Ratio		0.18						0.49				
Uniform Delay, d1		5.6						7.4				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.0						0.4				
Delay (s)		5.7						7.8				
Level of Service		A						A				
Approach Delay (s)		5.7			0.0			7.8			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	27.5	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	8	109	115	11	194	0	0	10	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			756			449			257	
Travel Time (s)		11.2			17.2			10.2			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	297	0	0	232	0	0	16	0
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)	0.0	0.0	0.0	22.0	22.0	0.0	28.0	28.0	0.0	0.0	28.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	44.0%	44.0%	0.0%	56.0%	56.0%	0.0%	0.0%	56.0%	0.0%
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.17			0.42			0.03	
Control Delay					3.4			9.7			5.5	
Queue Delay					0.0			0.0			0.0	
Total Delay					3.4			9.7			5.5	
Queue Length 50th (ft)					5			22			1	
Queue Length 95th (ft)					14			44			5	
Internal Link Dist (ft)		411			676			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					2501			1655			1639	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.12			0.14			0.01	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 27
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Clifford St & Richmond Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	8	109	115	11	194	0	0	10	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					0.93			1.00			0.97	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					3303			1876			1836	
Flt Permitted					1.00			0.98			1.00	
Satd. Flow (perm)					3303			1852			1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	10	140	147	12	220	0	0	12	4
RTOR Reduction (vph)	0	0	0	0	79	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	218	0	0	232	0	0	13	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					12.8			6.9			6.9	
Effective Green, g (s)					12.8			6.9			6.9	
Actuated g/C Ratio					0.46			0.25			0.25	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1526			461			457	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.07			c0.13				
v/c Ratio					0.14			0.50			0.03	
Uniform Delay, d1					4.3			8.9			7.9	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.0			0.6			0.0	
Delay (s)					4.3			9.5			7.9	
Level of Service					A			A			A	
Approach Delay (s)		0.0			4.3			9.5			7.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	27.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	90	21	369	851	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	136	0	393	905	0	0	0	0
Turn Type							Split					
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)	0.0	0.0	0.0	0.0	21.0	0.0	54.0	54.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	28.0%	0.0%	72.0%	72.0%	0.0%	0.0%	0.0%	0.0%
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.39		0.27	0.32				
Control Delay					28.4		0.7	2.4				
Queue Delay					0.0		0.0	0.0				
Total Delay					28.4		0.7	2.4				
Queue Length 50th (ft)					25		0	26				
Queue Length 95th (ft)					44		m14	m83				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					700		1478	2805				
Starvation Cap Reductn					0		0	0				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.19		0.27	0.32				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 506: Clifford St & East Franklin Street

ø1	ø2
21 s	54 s

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	90	21	369	851	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.97		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3188		1736	3471				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3188		1736	3471				
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	110	26	393	905	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	24	0	86	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	112	0	307	905	0	0	0	0
Confl. Peds. (#/hr)							2					
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Turn Type							Split					
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					6.4		58.6	58.6				
Effective Green, g (s)					6.4		58.6	58.6				
Actuated g/C Ratio					0.09		0.78	0.78				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					272		1356	2712				
v/s Ratio Prot					c0.04		0.18	c0.26				
v/s Ratio Perm												
v/c Ratio					0.41		0.23	0.33				
Uniform Delay, d1					32.5		2.2	2.4				
Progression Factor					1.00		0.89	0.81				
Incremental Delay, d2					0.7		0.3	0.3				
Delay (s)					33.2		2.3	2.3				
Level of Service					C		A	A				
Approach Delay (s)		0.0			33.2			2.3			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	5.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	433	105	524	541	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	727	0	576	595	0	0	0	0
Turn Type							Split					
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)	0.0	0.0	0.0	0.0	21.0	0.0	54.0	54.0	0.0	0.0	0.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	0.0%	28.0%	0.0%	72.0%	72.0%	0.0%	0.0%	0.0%	0.0%
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	5.0	4.0	5.0	5.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.95		0.49	0.26				
Control Delay					52.8		5.8	4.5				
Queue Delay					0.0		0.0	0.0				
Total Delay					52.8		5.8	4.5				
Queue Length 50th (ft)					168		89	42				
Queue Length 95th (ft)					#182		m100	m46				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					762		1165	2312				
Starvation Cap Reductn					0		0	0				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.95		0.49	0.26				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 56 (75%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clifford St & East Franklin Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	433	105	524	541	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.97		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3436		1770	3539				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3436		1770	3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	585	142	576	595	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	9	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	699	0	567	595	0	0	0	0
Confl. Peds. (#/hr)							2					
Turn Type							Split					
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					16.0		49.0	49.0				
Effective Green, g (s)					16.0		49.0	49.0				
Actuated g/C Ratio					0.21		0.65	0.65				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					733		1156	2312				
v/s Ratio Prot					c0.20		c0.32	0.17				
v/s Ratio Perm												
v/c Ratio					0.95		0.49	0.26				
Uniform Delay, d1					29.1		6.6	5.4				
Progression Factor					1.00		0.77	0.80				
Incremental Delay, d2					22.3		0.8	0.1				
Delay (s)					51.4		5.9	4.5				
Level of Service					D		A	A				
Approach Delay (s)		0.0			51.4			5.2			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	22.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

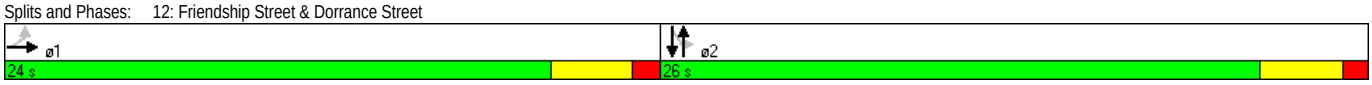
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	113	80	0	0	0	0	116	15	26	219	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		805			170			235			251	
Travel Time (s)		18.3			3.9			5.3			5.7	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	355	0	0	0	0	0	152	0	0	258	0
Turn Type	Perm									Perm		
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	24.0	24.0	0.0	0.0	0.0	0.0	0.0	26.0	0.0	26.0	26.0	0.0
Total Split (%)	48.0%	48.0%	0.0%	0.0%	0.0%	0.0%	0.0%	52.0%	0.0%	52.0%	52.0%	0.0%
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.46						0.24			0.45	
Control Delay		8.6						7.9			10.7	
Queue Delay		0.0						0.0			0.0	
Total Delay		8.6						7.9			10.7	
Queue Length 50th (ft)		27						12			25	
Queue Length 95th (ft)		66						44			82	
Internal Link Dist (ft)		725			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1315						1413			1325	
Starvation Cap Reductn		0						0			40	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.27						0.11			0.20	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 28.9
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Friendship Street & Dorrance Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	113	80	0	0	0	0	116	15	26	219	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.96						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		1780						1799			1766	
Flt Permitted		0.99						1.00			0.95	
Satd. Flow (perm)		1780						1799			1693	
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	80	161	114	0	0	0	0	135	17	27	231	0
RTOR Reduction (vph)	0	33	0	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	322	0	0	0	0	0	141	0	0	258	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Turn Type	Perm									Perm		
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		12.0						8.1			8.1	
Effective Green, g (s)		12.0						8.1			8.1	
Actuated g/C Ratio		0.43						0.29			0.29	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		760						519			488	
v/s Ratio Prot								0.08				
v/s Ratio Perm		0.18									c0.15	
v/c Ratio		0.42						0.27			0.53	
Uniform Delay, d1		5.6						7.7			8.4	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.3						0.2			0.7	
Delay (s)		5.9						7.9			9.1	
Level of Service		A						A			A	
Approach Delay (s)		5.9			0.0			7.9			9.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	28.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
Analysis Period (min)	15		

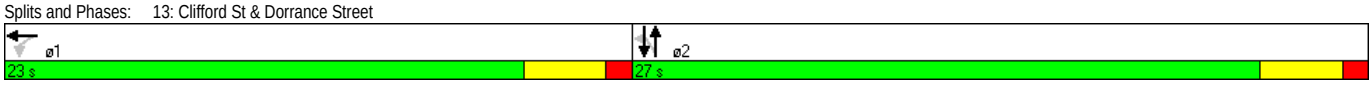
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	203	16	9	109	0	0	218	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		756			178			222			235	
Travel Time (s)		17.2			4.0			5.0			5.3	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	261	0	0	147	0	0	359	0
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)	0.0	0.0	0.0	23.0	23.0	0.0	27.0	27.0	0.0	0.0	27.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	46.0%	46.0%	0.0%	54.0%	54.0%	0.0%	0.0%	54.0%	0.0%
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.38			0.24			0.55	
Control Delay					9.7			7.6			9.9	
Queue Delay					0.0			0.0			0.0	
Total Delay					9.7			7.6			9.9	
Queue Length 50th (ft)					23			13			31	
Queue Length 95th (ft)					78			35			81	
Internal Link Dist (ft)		676			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1221			1405			1400	
Starvation Cap Reductn					0			0			53	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.21			0.10			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 29.7
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Clifford St & Dorrance Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	203	16	9	109	0	0	218	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					1842			1820			1736	
Flt Permitted					1.00			0.96			1.00	
Satd. Flow (perm)					1842			1756			1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	6	236	19	11	136	0	0	251	108
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	37	0
Lane Group Flow (vph)	0	0	0	0	255	0	0	147	0	0	322	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					11.0			10.4			10.4	
Effective Green, g (s)					11.0			10.4			10.4	
Actuated g/C Ratio					0.37			0.35			0.35	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					689			621			614	
v/s Ratio Prot											c0.19	
v/s Ratio Perm					0.14			0.08				
v/c Ratio					0.37			0.24			0.52	
Uniform Delay, d1					6.7			6.7			7.5	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.2			0.1			0.6	
Delay (s)					6.9			6.8			8.1	
Level of Service					A			A			A	
Approach Delay (s)		0.0			6.9			6.8			8.1	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	29.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	104	11	0	0	0	0	147	78	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			805			257			215	
Travel Time (s)		11.4			18.3			5.8			4.9	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	210	0	0	0	0	0	352	0	0	0	0
Turn Type	Perm											
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	22.0	22.0	0.0	0.0	0.0	0.0	0.0	28.0	0.0	0.0	0.0	0.0
Total Split (%)	44.0%	44.0%	0.0%	0.0%	0.0%	0.0%	0.0%	56.0%	0.0%	0.0%	0.0%	0.0%
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.17						0.55				
Control Delay		4.9						9.1				
Queue Delay		0.0						0.0				
Total Delay		4.9						9.1				
Queue Length 50th (ft)		5						28				
Queue Length 95th (ft)		17						35				
Internal Link Dist (ft)		422			725			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2200						1558				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.10						0.23				

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 27.5
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Friendship Street & Richmond Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	104	11	0	0	0	0	147	78	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.95				
Flt Protected		0.98						1.00				
Satd. Flow (prot)		3287						1758				
Flt Permitted		0.98						1.00				
Satd. Flow (perm)		3287						1758				
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Adj. Flow (vph)	68	128	14	0	0	0	0	230	122	0	0	0
RTOR Reduction (vph)	0	51	0	0	0	0	0	48	0	0	0	0
Lane Group Flow (vph)	0	159	0	0	0	0	0	304	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Perm											
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		10.2						9.2				
Effective Green, g (s)		10.2						9.2				
Actuated g/C Ratio		0.37						0.34				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1224						590				
v/s Ratio Prot								c0.17				
v/s Ratio Perm		0.05										
v/c Ratio		0.13						0.51				
Uniform Delay, d1		5.7						7.3				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.0						0.5				
Delay (s)		5.7						7.8				
Level of Service		A						A				
Approach Delay (s)		5.7			0.0			7.8			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	27.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		

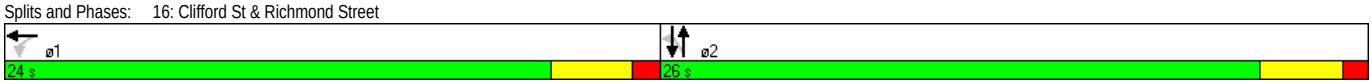
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	26	327	62	46	167	0	0	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			756			449			257	
Travel Time (s)		11.2			17.2			10.2			5.8	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	669	0	0	254	0	0	16	0
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)	0.0	0.0	0.0	24.0	24.0	0.0	26.0	26.0	0.0	0.0	26.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	48.0%	48.0%	0.0%	52.0%	52.0%	0.0%	0.0%	52.0%	0.0%
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.36			0.48			0.03	
Control Delay					6.6			11.9			6.9	
Queue Delay					0.0			0.0			0.0	
Total Delay					6.6			11.9			6.9	
Queue Length 50th (ft)					30			26			1	
Queue Length 95th (ft)					45			73			5	
Internal Link Dist (ft)		411			676			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					2566			1276			1355	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.26			0.20			0.01	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 30.5
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Clifford St & Richmond Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	26	327	62	46	167	0	0	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					0.98			1.00			0.97	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3483			1843			1836	
Flt Permitted					1.00			0.93			1.00	
Satd. Flow (perm)					3483			1728			1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Adj. Flow (vph)	0	0	0	42	527	100	55	199	0	0	12	4
RTOR Reduction (vph)	0	0	0	0	25	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	644	0	0	254	0	0	13	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type				Perm			Perm					
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					15.1			8.1			8.1	
Effective Green, g (s)					15.1			8.1			8.1	
Actuated g/C Ratio					0.48			0.26			0.26	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1686			449			477	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.18			c0.15				
v/c Ratio					0.38			0.57			0.03	
Uniform Delay, d1					5.1			10.0			8.6	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.1			1.3			0.0	
Delay (s)					5.2			11.3			8.6	
Level of Service					A			B			A	
Approach Delay (s)		0.0			5.2			11.3			8.6	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	31.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

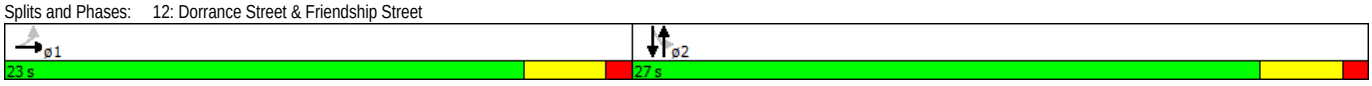
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	99	85	0	0	0	0	149	28	17	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		377			170			235			251	
Travel Time (s)		8.6			3.9			5.3			5.7	
Peak Hour Factor	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	276	0	0	0	0	0	268	0	0	262	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	23.0	23.0						27.0		27.0	27.0	
Total Split (%)	46.0%	46.0%						54.0%		54.0%	54.0%	
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.0						4.0			4.0	
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.35						0.38			0.42	
Control Delay		7.5						8.0			9.2	
Queue Delay		0.0						0.0			0.0	
Total Delay		7.5						8.0			9.2	
Queue Length 50th (ft)		19						23			26	
Queue Length 95th (ft)		64						42			61	
Internal Link Dist (ft)		297			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1272						1490			1367	
Starvation Cap Reductn		0						57			40	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.22						0.19			0.20	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 27
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Dorrance Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	48	99	85	0	0	0	0	149	28	17	198	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.95						0.98			1.00	
Flt Protected		0.99						1.00			1.00	
Satd. Flow (prot)		1753						1806			1720	
Flt Permitted		0.99						1.00			0.96	
Satd. Flow (perm)		1753						1806			1661	
Peak-hour factor, PHF	0.84	0.84	0.84	0.92	0.92	0.92	0.66	0.66	0.66	0.82	0.82	0.82
Adj. Flow (vph)	57	118	101	0	0	0	0	226	42	21	241	0
RTOR Reduction (vph)	0	47	0	0	0	0	0	15	0	0	0	0
Lane Group Flow (vph)	0	229	0	0	0	0	0	253	0	0	262	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	10%	10%	10%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		7.8						10.2			10.2	
Effective Green, g (s)		7.8						10.2			10.2	
Actuated g/C Ratio		0.30						0.39			0.39	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		525						708			651	
v/s Ratio Prot								0.14				
v/s Ratio Perm		0.13									c0.16	
v/c Ratio		0.44						0.36			0.40	
Uniform Delay, d1		7.3						5.6			5.7	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.4						0.2			0.3	
Delay (s)		7.7						5.8			6.0	
Level of Service		A						A			A	
Approach Delay (s)		7.7			0.0			5.8			6.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	26.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

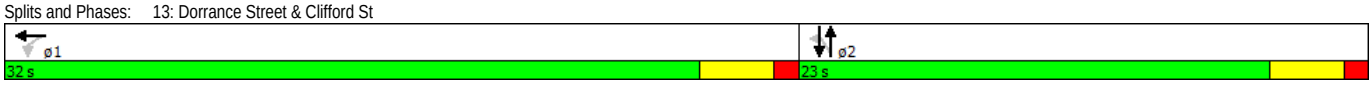
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	462	70	77	160	0	0	126	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		335			178			222			235	
Travel Time (s)		7.6			4.0			5.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	688	0	0	293	0	0	294	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)				32.0	32.0		23.0	23.0			23.0	
Total Split (%)				58.2%	58.2%		41.8%	41.8%			41.8%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.78			0.62			0.49	
Control Delay					16.6			20.1			11.8	
Queue Delay					0.0			0.2			0.1	
Total Delay					16.6			20.3			11.9	
Queue Length 50th (ft)					120			59			35	
Queue Length 95th (ft)					203			123			93	
Internal Link Dist (ft)		255			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1295			724			862	
Starvation Cap Reductn					0			81			72	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.53			0.46			0.37	

Intersection Summary

Area Type: Other
Cycle Length: 55
Actuated Cycle Length: 42.5
Natural Cycle: 55
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Dorrance Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	462	70	77	160	0	0	126	124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.98			1.00			0.93	
Flt Protected					1.00			0.98			1.00	
Satd. Flow (prot)					1847			1815			1657	
Flt Permitted					1.00			0.80			1.00	
Satd. Flow (perm)					1847			1479			1657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.81	0.81	0.81	0.85	0.85	0.85
Adj. Flow (vph)	0	0	0	6	592	90	95	198	0	0	148	146
RTOR Reduction (vph)	0	0	0	0	10	0	0	0	0	0	67	0
Lane Group Flow (vph)	0	0	0	0	678	0	0	293	0	0	227	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	3%	3%	3%	7%	7%	7%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					20.1			13.6			13.6	
Effective Green, g (s)					20.1			13.6			13.6	
Actuated g/C Ratio					0.48			0.33			0.33	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					890			482			540	
v/s Ratio Prot											0.14	
v/s Ratio Perm					0.37			c0.20				
v/c Ratio					0.76			0.61			0.42	
Uniform Delay, d1					8.8			11.8			11.0	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					3.7			1.8			0.3	
Delay (s)					12.5			13.6			11.3	
Level of Service					B			B			B	
Approach Delay (s)		0.0			12.5			13.6			11.3	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

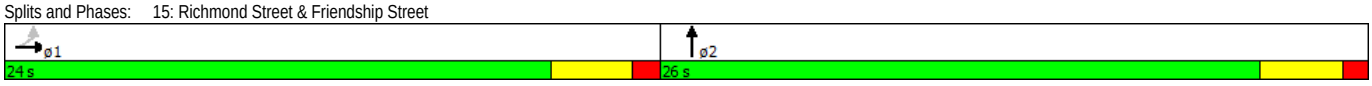
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	266	14	0	0	0	0	208	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			428			257			215	
Travel Time (s)		11.4			9.7			5.8			4.9	
Peak Hour Factor	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	463	0	0	0	0	0	334	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	24.0	24.0						26.0				
Total Split (%)	48.0%	48.0%						52.0%				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.33						0.53				
Control Delay		5.5						9.3				
Queue Delay		0.0						0.0				
Total Delay		5.5						9.3				
Queue Length 50th (ft)		13						27				
Queue Length 95th (ft)		38						65				
Internal Link Dist (ft)		422			348			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2466						1452				
Starvation Cap Reductn		0						7				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.19						0.23				

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 28.1
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Richmond Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	114	266	14	0	0	0	0	208	93	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.96				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		3371						1821				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		3371						1821				
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.90	0.90	0.90	0.92	0.92	0.92
Adj. Flow (vph)	134	313	16	0	0	0	0	231	103	0	0	0
RTOR Reduction (vph)	0	87	0	0	0	0	0	38	0	0	0	0
Lane Group Flow (vph)	0	376	0	0	0	0	0	296	0	0	0	0
Heavy Vehicles (%)	5%	5%	5%	2%	2%	2%	0%	0%	0%	2%	2%	2%
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		10.8						9.2				
Effective Green, g (s)		10.8						9.2				
Actuated g/C Ratio		0.39						0.33				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1300						598				
v/s Ratio Prot								c0.16				
v/s Ratio Perm		0.11										
v/c Ratio		0.29						0.49				
Uniform Delay, d1		5.9						7.5				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.1						0.4				
Delay (s)		6.0						8.0				
Level of Service		A						A				
Approach Delay (s)		6.0			0.0			8.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	28.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	34.4%	ICU Level of Service	A
Analysis Period (min)	15		

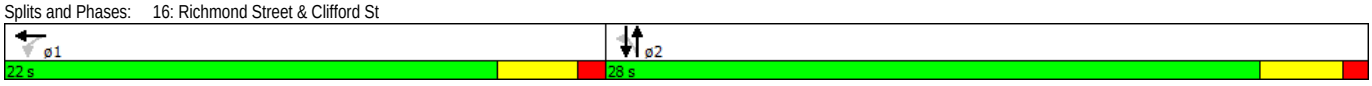
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	8	145	115	11	194	0	0	10	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			422			449			257	
Travel Time (s)		11.2			9.6			10.2			5.8	
Peak Hour Factor	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	343	0	0	232	0	0	16	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)				22.0	22.0		28.0	28.0			28.0	
Total Split (%)				44.0%	44.0%		56.0%	56.0%			56.0%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.20			0.42			0.03	
Control Delay					3.8			9.7			5.5	
Queue Delay					0.0			0.0			0.0	
Total Delay					3.8			9.7			5.5	
Queue Length 50th (ft)					7			22			1	
Queue Length 95th (ft)					17			44			5	
Internal Link Dist (ft)		411			342			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					2526			1652			1637	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.14			0.14			0.01	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 27
Natural Cycle: 40
Control Type: Actuated-Uncoordinated

Splits and Phases: 16: Richmond Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	8	145	115	11	194	0	0	10	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					0.94			1.00			0.97	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					3340			1876			1836	
Flt Permitted					1.00			0.98			1.00	
Satd. Flow (perm)					3340			1852			1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.78	0.78	0.78	0.88	0.88	0.88	0.81	0.81	0.81
Adj. Flow (vph)	0	0	0	10	186	147	12	220	0	0	12	4
RTOR Reduction (vph)	0	0	0	0	79	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	264	0	0	232	0	0	13	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	1%	1%	1%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					12.8			6.9			6.9	
Effective Green, g (s)					12.8			6.9			6.9	
Actuated g/C Ratio					0.46			0.25			0.25	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1543			461			457	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.08			c0.13				
v/c Ratio					0.17			0.50			0.03	
Uniform Delay, d1					4.4			8.9			7.9	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.0			0.6			0.0	
Delay (s)					4.4			9.5			7.9	
Level of Service					A			A			A	
Approach Delay (s)		0.0			4.4			9.5			7.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	27.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	102	44	369	970	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	178	0	393	1032	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)					18.0		57.0	57.0				
Total Split (%)					24.0%		76.0%	76.0%				
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.0		5.0	5.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.47		0.28	0.39				
Control Delay					25.5		0.7	3.0				
Queue Delay					0.0		0.0	0.0				
Total Delay					25.5		0.7	3.0				
Queue Length 50th (ft)					28		1	38				
Queue Length 95th (ft)					50		m5	m96				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					587		1414	2638				
Starvation Cap Reductn					0		0	0				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.30		0.28	0.39				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 48 (64%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 40
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 506: Clifford St & East Franklin Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	102	44	369	970	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.95		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3132		1736	3471				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3132		1736	3471				
Peak-hour factor, PHF	0.92	0.92	0.92	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	124	54	393	1032	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	48	0	94	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	130	0	299	1032	0	0	0	0
Confl. Peds. (#/hr)							2					
Heavy Vehicles (%)	2%	2%	2%	10%	10%	10%	4%	4%	4%	2%	2%	2%
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					8.0		57.0	57.0				
Effective Green, g (s)					8.0		57.0	57.0				
Actuated g/C Ratio					0.11		0.76	0.76				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					334		1319	2637				
v/s Ratio Prot					c0.04		0.17	c0.30				
v/s Ratio Perm												
v/c Ratio					0.39		0.23	0.39				
Uniform Delay, d1					31.2		2.6	3.1				
Progression Factor					1.00		0.61	0.78				
Incremental Delay, d2					0.5		0.4	0.4				
Delay (s)					31.7		1.9	2.8				
Level of Service					C		A	A				
Approach Delay (s)		0.0			31.7			2.5			0.0	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	5.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	512	253	524	560	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes	Yes		Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		469			1036			530			228	
Travel Time (s)		10.7			23.5			12.0			5.2	
Confl. Peds. (#/hr)							2					
Peak Hour Factor	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	1034	0	576	615	0	0	0	0
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Detector Phase					1		2	2				
Switch Phase												
Minimum Initial (s)					6.0		10.0	10.0				
Minimum Split (s)					11.0		21.0	21.0				
Total Split (s)					28.0		47.0	47.0				
Total Split (%)					37.3%		62.7%	62.7%				
Yellow Time (s)					3.0		3.0	3.0				
All-Red Time (s)					2.0		2.0	2.0				
Lost Time Adjust (s)					0.0		0.0	0.0				
Total Lost Time (s)					5.0		5.0	5.0				
Lead/Lag					Lead		Lag	Lag				
Lead-Lag Optimize?					Yes		Yes	Yes				
Recall Mode					None		C-Max	C-Max				
v/c Ratio					0.93		0.57	0.31				
Control Delay					38.8		10.3	8.6				
Queue Delay					0.0		0.0	0.0				
Total Delay					38.8		10.3	8.6				
Queue Length 50th (ft)					218		122	64				
Queue Length 95th (ft)					220		m147	m74				
Internal Link Dist (ft)		389			956			450			148	
Turn Bay Length (ft)												
Base Capacity (vph)					1112		1016	1985				
Starvation Cap Reductn					0		0	0				
Spillback Cap Reductn					0		0	0				
Storage Cap Reductn					0		0	0				
Reduced v/c Ratio					0.93		0.57	0.31				

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 52 (69%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: Clifford St & East Franklin Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	0	512	253	524	560	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					5.0		5.0	5.0				
Lane Util. Factor					0.95		1.00	0.95				
Frpb, ped/bikes					1.00		1.00	1.00				
Flpb, ped/bikes					1.00		1.00	1.00				
Frt					0.95		1.00	1.00				
Flt Protected					1.00		0.95	1.00				
Satd. Flow (prot)					3364		1770	3539				
Flt Permitted					1.00		0.95	1.00				
Satd. Flow (perm)					3364		1770	3539				
Peak-hour factor, PHF	0.92	0.92	0.92	0.74	0.74	0.74	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	0	692	342	576	615	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	81	0	23	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	953	0	553	615	0	0	0	0
Confl. Peds. (#/hr)							2					
Turn Type					NA		Split	NA				
Protected Phases					1		2	2				
Permitted Phases												
Actuated Green, G (s)					22.9		42.1	42.1				
Effective Green, g (s)					22.9		42.1	42.1				
Actuated g/C Ratio					0.31		0.56	0.56				
Clearance Time (s)					5.0		5.0	5.0				
Vehicle Extension (s)					2.4		2.4	2.4				
Lane Grp Cap (vph)					1027		993	1986				
v/s Ratio Prot					c0.28		c0.31	0.17				
v/s Ratio Perm												
v/c Ratio					0.93		0.56	0.31				
Uniform Delay, d1					25.2		10.5	8.7				
Progression Factor					1.00		0.90	0.94				
Incremental Delay, d2					13.7		1.4	0.2				
Delay (s)					39.0		10.8	8.5				
Level of Service					D		B	A				
Approach Delay (s)		0.0			39.0			9.6			0.0	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	281	80	0	0	0	0	116	15	26	219	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		377			170			235			251	
Travel Time (s)		8.6			3.9			5.3			5.7	
Peak Hour Factor	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	595	0	0	0	0	0	152	0	0	258	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Detector Phase	1	1						2		2	2	
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0		6.0	6.0	
Minimum Split (s)	21.0	21.0						21.0		21.0	21.0	
Total Split (s)	29.0	29.0						21.0		21.0	21.0	
Total Split (%)	58.0%	58.0%						42.0%		42.0%	42.0%	
Yellow Time (s)	3.0	3.0						3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0						1.0		1.0	1.0	
Lost Time Adjust (s)		0.0						0.0			0.0	
Total Lost Time (s)		4.0						4.0			4.0	
Lead/Lag	Lead	Lead						Lag		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes						Yes		Yes	Yes	
Recall Mode	None	None						None		None	None	
v/c Ratio		0.63						0.25			0.46	
Control Delay		10.7						11.0			14.1	
Queue Delay		0.0						0.0			0.0	
Total Delay		10.7						11.0			14.1	
Queue Length 50th (ft)		68						18			38	
Queue Length 95th (ft)		126						58			110	
Internal Link Dist (ft)		297			90			155			171	
Turn Bay Length (ft)												
Base Capacity (vph)		1369						1037			969	
Starvation Cap Reductn		0						0			35	
Spillback Cap Reductn		0						0			0	
Storage Cap Reductn		0						0			0	
Reduced v/c Ratio		0.43						0.15			0.28	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 33.6
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 12: Dorrance Street & Friendship Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	281	80	0	0	0	0	116	15	26	219	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		1.00						1.00			1.00	
Frt		0.97						0.98			1.00	
Flt Protected		0.99						1.00			0.99	
Satd. Flow (prot)		1820						1799			1766	
Flt Permitted		0.99						1.00			0.95	
Satd. Flow (perm)		1820						1799			1692	
Peak-hour factor, PHF	0.70	0.70	0.70	0.92	0.92	0.92	0.86	0.86	0.86	0.95	0.95	0.95
Adj. Flow (vph)	80	401	114	0	0	0	0	135	17	27	231	0
RTOR Reduction (vph)	0	17	0	0	0	0	0	11	0	0	0	0
Lane Group Flow (vph)	0	578	0	0	0	0	0	141	0	0	258	0
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		1						2			2	
Permitted Phases	1									2		
Actuated Green, G (s)		17.3						8.4			8.4	
Effective Green, g (s)		17.3						8.4			8.4	
Actuated g/C Ratio		0.51						0.25			0.25	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		2.4						2.4			2.4	
Lane Grp Cap (vph)		934						448			421	
v/s Ratio Prot								0.08				
v/s Ratio Perm		0.32									c0.15	
v/c Ratio		0.62						0.32			0.61	
Uniform Delay, d1		5.9						10.3			11.2	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.0						0.3			2.2	
Delay (s)		6.9						10.6			13.4	
Level of Service		A						B			B	
Approach Delay (s)		6.9			0.0			10.6			13.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	33.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

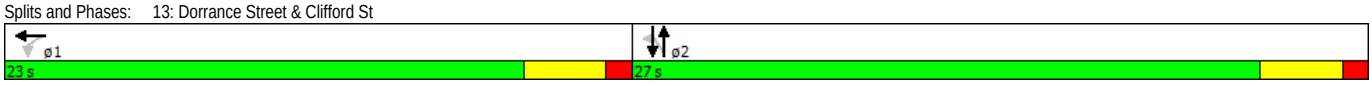
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	247	16	9	109	0	0	218	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		349			178			222			235	
Travel Time (s)		7.9			4.0			5.0			5.3	
Peak Hour Factor	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	312	0	0	147	0	0	359	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				21.0	21.0		21.0	21.0			21.0	
Total Split (s)				23.0	23.0		27.0	27.0			27.0	
Total Split (%)				46.0%	46.0%		54.0%	54.0%			54.0%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.45			0.24			0.56	
Control Delay					10.4			8.0			10.3	
Queue Delay					0.0			0.0			0.0	
Total Delay					10.4			8.0			10.3	
Queue Length 50th (ft)					30			13			31	
Queue Length 95th (ft)					97			39			90	
Internal Link Dist (ft)		269			98			142			155	
Turn Bay Length (ft)												
Base Capacity (vph)					1196			1375			1370	
Starvation Cap Reductn					0			0			58	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.26			0.11			0.27	

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 30.6
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 13: Dorrance Street & Clifford St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	5	247	16	9	109	0	0	218	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					1.00			1.00			1.00	
Frt					0.99			1.00			0.96	
Flt Protected					1.00			1.00			1.00	
Satd. Flow (prot)					1846			1820			1736	
Flt Permitted					1.00			0.96			1.00	
Satd. Flow (perm)					1846			1757			1736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.86	0.86	0.86	0.80	0.80	0.80	0.87	0.87	0.87
Adj. Flow (vph)	0	0	0	6	287	19	11	136	0	0	251	108
RTOR Reduction (vph)	0	0	0	0	5	0	0	0	0	0	37	0
Lane Group Flow (vph)	0	0	0	0	307	0	0	147	0	0	322	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	4%	4%	4%	5%	5%	5%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					11.6			10.7			10.7	
Effective Green, g (s)					11.6			10.7			10.7	
Actuated g/C Ratio					0.38			0.35			0.35	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					706			620			613	
v/s Ratio Prot											c0.19	
v/s Ratio Perm					0.17			0.08				
v/c Ratio					0.43			0.24			0.53	
Uniform Delay, d1					6.9			6.9			7.8	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.3			0.1			0.6	
Delay (s)					7.2			7.0			8.4	
Level of Service					A			A			A	
Approach Delay (s)		0.0			7.2			7.0			8.4	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	30.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.1%	ICU Level of Service	A
Analysis Period (min)	15		

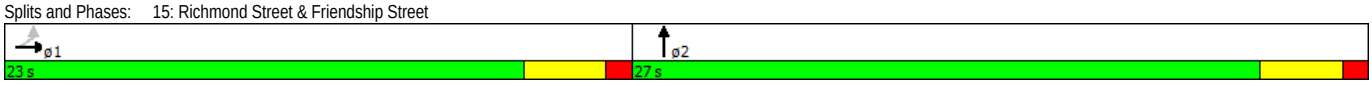
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	123	11	0	0	0	0	147	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red	Yes		Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		502			428			257			215	
Travel Time (s)		11.4			9.7			5.8			4.9	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	234	0	0	0	0	0	282	0	0	0	0
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Detector Phase	1	1						2				
Switch Phase												
Minimum Initial (s)	10.0	10.0						6.0				
Minimum Split (s)	21.0	21.0						21.0				
Total Split (s)	23.0	23.0						27.0				
Total Split (%)	46.0%	46.0%						54.0%				
Yellow Time (s)	3.0	3.0						3.0				
All-Red Time (s)	1.0	1.0						1.0				
Lost Time Adjust (s)		0.0						0.0				
Total Lost Time (s)		4.0						4.0				
Lead/Lag	Lead	Lead						Lag				
Lead-Lag Optimize?	Yes	Yes						Yes				
Recall Mode	Min	Min						None				
v/c Ratio		0.17						0.50				
Control Delay		4.5						9.7				
Queue Delay		0.0						0.0				
Total Delay		4.5						9.7				
Queue Length 50th (ft)		5						24				
Queue Length 95th (ft)		16						32				
Internal Link Dist (ft)		422			348			177			135	
Turn Bay Length (ft)												
Base Capacity (vph)		2265						1484				
Starvation Cap Reductn		0						0				
Spillback Cap Reductn		0						0				
Storage Cap Reductn		0						0				
Reduced v/c Ratio		0.10						0.19				

Intersection Summary

Area Type: Other
Cycle Length: 50
Actuated Cycle Length: 28.2
Natural Cycle: 45
Control Type: Actuated-Uncoordinated

Splits and Phases: 15: Richmond Street & Friendship Street



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	123	11	0	0	0	0	147	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0						4.0				
Lane Util. Factor		0.95						1.00				
Frt		0.99						0.98				
Flt Protected		0.99						1.00				
Satd. Flow (prot)		3296						1799				
Flt Permitted		0.99						1.00				
Satd. Flow (perm)		3296						1799				
Peak-hour factor, PHF	0.81	0.81	0.81	0.92	0.92	0.92	0.64	0.64	0.64	0.92	0.92	0.92
Adj. Flow (vph)	68	152	14	0	0	0	0	230	52	0	0	0
RTOR Reduction (vph)	0	48	0	0	0	0	0	21	0	0	0	0
Lane Group Flow (vph)	0	186	0	0	0	0	0	261	0	0	0	0
Heavy Vehicles (%)	7%	7%	7%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Turn Type	Perm	NA						NA				
Protected Phases		1						2				
Permitted Phases	1											
Actuated Green, G (s)		11.6						8.6				
Effective Green, g (s)		11.6						8.6				
Actuated g/C Ratio		0.41						0.30				
Clearance Time (s)		4.0						4.0				
Vehicle Extension (s)		2.4						2.4				
Lane Grp Cap (vph)		1355						548				
v/s Ratio Prot								c0.15				
v/s Ratio Perm		0.06										
v/c Ratio		0.14						0.48				
Uniform Delay, d1		5.2						8.0				
Progression Factor		1.00						1.00				
Incremental Delay, d2		0.0						0.4				
Delay (s)		5.2						8.4				
Level of Service		A						A				
Approach Delay (s)		5.2			0.0			8.4			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	28.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	26	554	17	46	167	0	0	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		491			408			449			257	
Travel Time (s)		11.2			9.3			10.2			5.8	
Peak Hour Factor	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	963	0	0	254	0	0	16	0
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Detector Phase				1	1		2	2			2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		6.0	6.0			6.0	
Minimum Split (s)				18.0	18.0		18.0	18.0			18.0	
Total Split (s)				27.0	27.0		23.0	23.0			23.0	
Total Split (%)				54.0%	54.0%		46.0%	46.0%			46.0%	
Yellow Time (s)				3.0	3.0		3.0	3.0			3.0	
All-Red Time (s)				1.0	1.0		1.0	1.0			1.0	
Lost Time Adjust (s)					0.0			0.0			0.0	
Total Lost Time (s)					4.0			4.0			4.0	
Lead/Lag				Lead	Lead		Lag	Lag			Lag	
Lead-Lag Optimize?				Yes	Yes		Yes	Yes			Yes	
Recall Mode				Min	Min		None	None			None	
v/c Ratio					0.54			0.53			0.03	
Control Delay					8.1			15.7			9.0	
Queue Delay					0.0			0.0			0.0	
Total Delay					8.1			15.7			9.0	
Queue Length 50th (ft)					56			36			1	
Queue Length 95th (ft)					74			92			7	
Internal Link Dist (ft)		411			328			369			177	
Turn Bay Length (ft)												
Base Capacity (vph)					2276			908			961	
Starvation Cap Reductn					0			0			0	
Spillback Cap Reductn					0			0			0	
Storage Cap Reductn					0			0			0	
Reduced v/c Ratio					0.42			0.28			0.02	

Intersection Summary	
Area Type:	Other
Cycle Length: 50	
Actuated Cycle Length: 37.3	
Natural Cycle: 40	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 16: Richmond Street & Clifford St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	26	554	17	46	167	0	0	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)					4.0			4.0			4.0	
Lane Util. Factor					0.95			1.00			1.00	
Frt					1.00			1.00			0.97	
Flt Protected					1.00			0.99			1.00	
Satd. Flow (prot)					3551			1843			1836	
Flt Permitted					1.00			0.93			1.00	
Satd. Flow (perm)					3551			1738			1836	
Peak-hour factor, PHF	0.92	0.92	0.92	0.62	0.62	0.62	0.84	0.84	0.84	0.56	0.56	0.56
Adj. Flow (vph)	0	0	0	42	894	27	55	199	0	0	12	4
RTOR Reduction (vph)	0	0	0	0	4	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	0	0	0	959	0	0	254	0	0	13	0
Heavy Vehicles (%)	2%	2%	2%	1%	1%	1%	2%	2%	2%	0%	0%	0%
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					1			2			2	
Permitted Phases				1			2					
Actuated Green, G (s)					18.8			10.3			10.3	
Effective Green, g (s)					18.8			10.3			10.3	
Actuated g/C Ratio					0.51			0.28			0.28	
Clearance Time (s)					4.0			4.0			4.0	
Vehicle Extension (s)					2.4			2.4			2.4	
Lane Grp Cap (vph)					1799			482			509	
v/s Ratio Prot											0.01	
v/s Ratio Perm					0.27			c0.15				
v/c Ratio					0.53			0.53			0.03	
Uniform Delay, d1					6.2			11.3			9.7	
Progression Factor					1.00			1.00			1.00	
Incremental Delay, d2					0.2			0.7			0.0	
Delay (s)					6.4			12.1			9.8	
Level of Service					A			B			A	
Approach Delay (s)		0.0			6.4			12.1			9.8	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	37.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	41.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Unsignalized Capacity Analysis

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	310	350	0	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	337	380	0	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		422	335			
pX, platoon unblocked						
vC, conflicting volume	717				527	359
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	717				527	359
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	94
cM capacity (veh/h)	879				481	638

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	225	493	39
Volume Left	0	0	0
Volume Right	0	380	39
cSH	1700	1700	638
Volume to Capacity	0.13	0.29	0.06
Queue Length 95th (ft)	0	0	5
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0		11.0
Approach LOS			B

Intersection Summary			
Average Delay		0.6	
Intersection Capacity Utilization		29.8%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	208	150	0	0	0	27
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	226	163	0	0	0	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	428			377		
pX, platoon unblocked			0.94		0.94	0.94
vC, conflicting volume			389		308	308
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			324		238	238
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	96
cM capacity (veh/h)			1167		709	757

Direction, Lane #	EB 1	NB 1
Volume Total	389	29
Volume Left	0	0
Volume Right	163	29
cSH	1700	757
Volume to Capacity	0.23	0.04
Queue Length 95th (ft)	0	3
Control Delay (s)	0.0	9.9
Lane LOS		A
Approach Delay (s)	0.0	9.9
Approach LOS		A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	307	44	0	287
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	334	48	0	312
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		408	349			
pX, platoon unblocked						
vC, conflicting volume	382				358	191
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	382				358	191
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	62
cM capacity (veh/h)	1174				614	819

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total	222	159	312
Volume Left	0	0	0
Volume Right	0	48	312
cSH	1700	1700	819
Volume to Capacity	0.13	0.09	0.38
Queue Length 95th (ft)	0	0	45
Control Delay (s)	0.0	0.0	12.1
Lane LOS			B
Approach Delay (s)	0.0		12.1
Approach LOS			B

Intersection Summary			
Average Delay	5.4		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	136	19	0	0	0	213
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	148	21	0	0	0	232
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	428			377		
pX, platoon unblocked						
vC, conflicting volume			168		158	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			168		158	158
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	74
cM capacity (veh/h)			1409		833	887

Direction, Lane #	EB 1	NB 1
Volume Total	168	232
Volume Left	0	0
Volume Right	21	232
cSH	1700	887
Volume to Capacity	0.10	0.26
Queue Length 95th (ft)	0	26
Control Delay (s)	0.0	10.5
Lane LOS		B
Approach Delay (s)	0.0	10.5
Approach LOS		B

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

KEOUGH
CONSTRUCTION MANAGEMENT

Rhode Island Convention Center Authority

The Garrahy Courthouse Parking Garage #GCG2018

Notice to Bidders # 1
March 8, 2018

The Bid Due Date originally scheduled for Wednesday, March 14, 2018 at 1:30 pm is being extended to Tuesday, March 20, 2018 at 1:30 pm.

Sealed Bids must be received at the office of:

The Rhode Island Convention Center Authority
Dunkin Donuts Center – Third Floor
One LaSalle Square
Providence, RI 02903
Attention James P. McCarvill, Executive Director

Please Note:
Addendum # 2 was issued this morning and is posted on the State of Rhode Island Website.

Addendum # 3 will be posted by the end of the day tomorrow, Friday, March 9, 2018.

SECTION 316613 - COMPACTED AGGREGATE PIERS AND GROUTED COMPACTED AGGREGATE PIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. All of the Contract Documents, including General and Supplementary Conditions and General Requirements, apply to the work of this Section.

B. Geotechnical Information:
Review logs of test borings and other pertinent data for the site. Exploration logs are provided in Appendix A and B and exploration locations are indicated on the drawings and are considered part of the specifications. Aforementioned data is for general information and is accurate only at the particular locations and times the subsurface explorations were made. It is the Contractor's responsibility to make interpretations and draw conclusions based on the character of materials to be encountered and the impact on the work specified herein, based on the Contractor's expert knowledge of the area and of foundation installation techniques. These reports are specifically not part of the contract documents, but are available to bidders for informational purposes.

1.2 SUMMARY

A. The work in this section will include the designing, furnishing and installing compacted aggregate piers (CAP) and Grouted Compacted Aggregate Piers (GCAP) to provide ground improvement to the lines and grades designated on the project foundation plans and as specified herein. CAP and GCAP elements shall be in columnar-type configuration and shall provide foundation support for the building foundations and slab. Aggregate piers shall consist of compacted aggregate, with or without grout, designed and installed in a manner that reinforces the ground, and supports all footings and floor slabs of the proposed new Garrahy Courthouse Parking Garage. It is anticipated that compacted aggregate piers may consist of either: Vibro Stone Columns, Rammed Aggregate Piers®, or Vibro Piers® or approved equal. Displacement AugercastGrout Columns (DAGC's) such as Controlled Modulus Columns® (CMC) or approved equal are also considered viable if similar performance of the ground improvement system can be demonstrated. Compacted aggregate piers shall be installed using a displacement method that does not generate spoils.

B. Coordinate work with that of all other trades or contracts affecting or affected by work of this Section. Cooperate with such trades to assure the steady progress of all work under the Contract.

1.3 DEFINITIONS

A. **Compacted Aggregate Piers –** Compacted aggregate piers are columns of compacted stone installed in groups in poor soil to increase allowable bearing pressure

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and mitigate settlement under structural footings. Aggregate piers are formed when lifts of stone are introduced to an open hole and compacted using high-energy densification equipment.

B. **Grouted Compacted Aggregate Piers -** A column formed of aggregate and grout which can be installed to carry the load from the structure, wall or other load-bearing system through the very soft soils to a competent stratum below. Grouted compacted aggregate piers are constructed in a similar fashion to the compacted aggregate piers with grout added to the mixture to provide a high capacity element in a very soft/loose soil stratum.

1.4 PRODUCTS AND PERFORMANCE DESIGN CRITERIA

A. The overall compacted aggregate pier design, quality of materials and methods of installation for all aggregate pier applications necessary to accomplish the Work specified shall be consistent with the established standards of the construction industry. The design and implementation thereof shall be in accordance with sound engineering practice and modern accepted principles of soil mechanics and shall include the effects of all applicable forces. The methods employed shall be to the extent necessary to permit the proper and satisfactory installation and construction of the Work specified.

B. The Contractor and Contractor's Engineer's attention is directed to the fact that should any additional investigations, subsurface explorations and/or other appurtenant information be required to fulfill the needs of this design, as determined by the Contractors' Engineer, above and beyond that which is already provided under these Contract Documents, the Contractor shall obtain all such information and data at his own expense.

C. It is anticipated that Aggregate piers shall be employed beneath footings and the floor slab areas and shall be advanced to below the non-engineered fill and organic soils and soft silt identified in the test boring logs, to the top of the natural glacial till deposit and shall penetrate into the glacial till a sufficient distance to establish bearing and/or tension capacity. The Contract documents include an existing conditions plan indicating the existing grades on the site and a plan indicating the planned building floor slab elevations. **The Contractor shall install the compacted aggregate piers so that a minimum of one foot of compacted structural fill can be placed above them to the underside of building footings and/or slabs-on-grade.**

D. Drawing S-2 includes the footings and grade beams requiring support of the garage. Compacted grouted aggregate piers shall be provided to support all footings with an allowable bearing capacity of 8,000 pounds per square foot. In addition, the floors in the garage shall be provided with support for the following loads:
   1. Ground floor garage slab – 125 pounds per square foot
   2. Ground floor commercial space and stair lobby slab – 200 pounds per square foot
   3. Ground floor garage slab on floor B1 and ramp up to ground floor – 0 pounds per square foot

E. Aggregate piers beneath footings shall be designed and installed to meet the following

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criteria:

1.) Allowable footing bearing pressure per Structural Drawings is 8,000 psf;

2) 1-inch maximum total long-term settlement for footings;

3) ½-inch maximum long-term differential settlement of adjacent footings.

F. Aggregate piers supporting the floor slab shall be designed to support floor loads per Structural Drawings and Section 1.4.D with less than one inch of settlement.

G. The Contractor's pier design shall include design spacing, subject to the following maximum spacing guidance:

1) The maximum allowable spacing of piers within the building area (where a concrete floor slab will be provided at the surface) shall be ten (10) feet (in a triangular or square grid).

2) The maximum allowable spacing of piers below the proposed exterior footings shall be six (6) feet. Exceedance of the Contractor's design from the above spacing guidance will be evaluated by the Owner's Geotechnical Engineer.

3) The spacing for slab support shall consider the location of the slab control joints as provided on the project structural drawings.

H. Piers shall be designed to preclude bulging and excessive stresses in the pier.

I. The results of the modulus test shall confirm the Contractor's design parameters for aggregate piers. If the results of modulus testing do not confirm the aggregate pier design, the pier design shall be revised and an additional modulus test shall be performed.

J. The Contractor shall be responsible for all damage related to work under this section.

K. The design life of the structure shall be 50 years.

L. Where grouted compacted aggregate piers are proposed, a granular Footing Pad (or "Load Transfer Platform") shall be required below all footings and slabs to be supported by the grouted elements. The system shall be designed and perform to limit penetration (punching) of ground improvement elements into the Footing Pad.

M. The CAP or GCAP design submittal for the slab-on-grade shall include a Finite Element Analysis (FEA) to demonstrate that the maximum bending moment and maximum shear stress at the midpoint of the most widely-spaced slab support CAP or GCAP elements are within tolerances specified by the Engineer. For the FEA, the minimum CAP or GCAP stiffness modulus value shall be verified by modulus testing. The stiffness modulus value shall be reduced exponentially for each foot of radial distance

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away from the edge of the CAP or GCAP element in accordance with a referenced industry-accepted standard(s).

N. All Aggregate Pier elements shall be designed using a stiffness modulus to be verified by the results of the modulus test.

1.5 SUBMITTALS

A. Contractor Qualifications:

The Contractor shall submit the name and credentials of a fully competent and qualified aggregate pier subcontractor for approval by the Geotechnical Engineer. The aggregate pier subcontractor shall demonstrate a minimum of five (5) years documented experience in the field of aggregate pier design and construction, both aggregate and grouted aggregate piers. The aggregate pier subcontractor shall document the installation of a minimum of 20 projects in New England and five in Rhode Island. This documentation shall be provided in a submittal and shall include the names, addresses and contact information for a minimum of five references who can attest to this work. Said references shall be from the Owner of the project or their geotechnical engineer. The Contractor shall also provide the name and qualifications of the foreman conducting the aggregate pier installation. Only after a satisfactory review of the Contractor's Engineer's overall qualifications by the Engineer in fulfillment of the requisite experience hereinbefore specified shall the Contractor finalize such employment and begin the design aspects of the Work.

B. Designer Qualifications:

1. The Contractor shall submit the name and credentials of a fully competent and qualified Professional Engineer, hereinafter referred to as the "Contractor's Engineer", registered in the State of Rhode Island, to provide the design of the aggregate piers to accomplish the Work specified, and for supervising the proper on-site installation associated therewith. The Contractor's Engineer shall demonstrate a minimum of five (5) years documented experience in the field of aggregate pier design and implementation. Prior to the actual employment of the Contractor's Engineer, the Contractor shall submit to the Engineer, to the full extent deemed necessary, a detailed resume stating the Contractor's Engineer's professional qualifications, related experience and references, and if requested, examples of work similar to that required for the Work specified, for a general review by the Engineer and as a means of documenting the requisite experience hereinbefore specified. Only after a satisfactory review of the Contractor's Engineer's overall qualifications by the Engineer in fulfillment of the requisite experience hereinbefore specified shall the Contractor finalize such employment and begin the design aspects of the Work.
2. The Contractor's Engineer shall have Professional Liability Insurance for this work with a minimum coverage limit of $2 million per occurrence.

C. Delegated Design Submittal:

1. Prior to the installation of any aggregate piers, the Contractor shall

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submit to the Engineer for review, complete aggregate pier layout and detail drawings and descriptions bearing the Contractor's Engineer's State of Rhode Island Professional Engineer's Seal and signature. Said submission will be reviewed for compliance with design concept and will not be considered an approval or disapproval of design and/or implementation thereof. This submission will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as an approval or guarantee that the Contractor's proposed equipment, materials and methods for the installation will be adequate for the work required by this Contract.

2. Included as part of this submission, the Contractor's Engineer must provide a complete listing of all references, codes and specifications used by the Contractor's Engineer and required by any federal, state or local agency having jurisdiction, and to which the pier design conforms.
3. Specific design information is to be submitted to the Engineer and will be reviewed for overall compliance with the design concept. Information shall include detailed description of what the load bearing capacity is and how it is determined.
4. The Contractor's Engineer shall submit 3 sets of detailed design calculations, construction drawings, and shop drawings prepared by the Contractor's Engineer for review and approval at least 3 weeks prior to the beginning of construction. A detailed explanation of the design parameters for bearing capacity and settlement calculations, and modulus / load test procedures shall be included in the Design Submittal. All calculations and drawings shall be prepared and sealed by a Professional Engineer licensed in Rhode Island. The submittal shall include grout/cement mix design as applicable.
5. The design information shall include, but not be limited to, element configurations, materials, capacity and spacing, details and design of Footing Pads (if Footing Pads are required), bearing capacity analysis, settlement analyses, explanation of soil properties, element installation termination criteria, embedment depth into the bearing stratum, and all other relevant information. The design calculations shall quantify the CAP or GCAP element's maximum design stress on an individual element and is typically at least 3 to 5 times the allowable bearing pressure for footings.

D. Modulus Test Report

Within one week after completion of modulus / load testing on aggregate piers, as required by this Section, the Contractor shall submit for review and approval to the Geotechnical Engineer a description of the installation equipment, installation records, complete test data, and analysis of the test data, and recommended design parameters. The report shall be sealed by a Professional Engineer licensed in the State of Rhode Island and if successful shall affirm that the pier design meets the required performance criteria.

E. Installation Reports

1. The Contractor shall furnish a complete and accurate record of CAP

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installation to the Geotechnical Engineer. The record shall indicate the element location, length, volume of aggregate used or number of lifts, densification forces during installation, and final elevations or depths of the base and top of elements. The record shall also indicate the type and size of the installation equipment used, and the type of aggregate used. The Contractor shall immediately report any unusual conditions encountered during installation to the Geotechnical Engineer.

2. The Contractor shall demonstrate that the ground improvement piers comply with all applicable Building Code and regulatory requirements. The Contractor shall provide a letter stamped by a Rhode Island Registered Professional Engineer to the Owner stating that applicable building code and regulatory requirements have been met.

1.6 QUALITY ASSURANCE

A. The Contractor's Engineer shall provide and maintain throughout the aggregate pier installation and/or Work sufficient supervision and technical guidance to the contractor for proper materials, equipment, operations and methods to the extent necessary to assure strict compliance with the Contractor's Engineer's design, all safety procedures and standard requirements for such Work, and the successful completion of the Work. Failure to provide and/or maintain such supervision and/or technical guidance during the Work shall in no way relieve the Contractor's Engineer and/or the Contractor from their overall responsibilities and obligations under the Contract, nor shall it be a basis for any claim by either against the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer shall fully indemnify and save harmless the Owner and Engineer and their employees and representatives, from and against any and all claims as stipulated under the Agreement, whether directly or indirectly arising out of, relating to or in connection with the Work.

C. The Contractor shall have a qualified full-time solely dedicated quality control (QC) person approved by the Contractor's Engineer and the Geotechnical Engineer to verify and report all installation procedures. Quality assurances and proper safety procedures must be maintained at all times and be in strict accordance with the Contractor's Engineer's requirements and consistent with all federal, state and local regulatory agencies having jurisdiction over the Work. Should any conflict in requirements, regulations, restrictions or codes exist between that which is specified by the Contractor's Engineer and any federal, state or local agency, the more stringent application shall prevail.

D. The Owner's Geotechnical Engineer shall also monitor the installation of all aggregate piers including production and pre-production modulus testing piers. The Contractor shall provide a minimum 48-hour notice to the Owner and Owner's Geotechnical Engineer prior to installation of any aggregate piers. Aggregate piers installed without the presence of the Owner's Geotechnical Engineer will be rejected and additional piers shall be installed if necessary to replace the rejected piers at no cost to the Owner.

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E. Install Qualifications: Installers shall have demonstrated experience in the construction of similar size and types of projects. Installers of aggregate piers shall have a minimum of 5 years of experience with the installation of aggregate piers and shall have completed at least 5 similar projects.

F. Pre-Construction Survey: The Engineer shall conduct a pre-construction survey of adjacent structures within 200 feet of the proposed aggregate pier installations prior to the start of the work in this specification. These reports shall include photographs with location, video and description of facility. A copy of these reports will be made available to the Contractor and the Contractor shall make any additional pre-construction survey work that they consider necessary.

G. Vibration Limits and Monitoring: The Engineer will monitor the installation vibration levels for ongoing construction as contained herein. The Contractor shall conduct any additional vibration monitoring they consider to be necessary. The aggregate pier installation vibration levels shall be kept within acceptable limits during all construction. The maximum peak particle velocity of vibrations which will be allowed at new or existing construction will be 0.4 inches per second or to such lower limit established by the Engineer or Contractor. Additionally, no aggregate pier installation operation shall be undertaken within 50 feet of young concrete (aged 7 days or less). If the minimum specified levels are exceeded, appropriate changes shall immediately be made to the Contractor's installation procedure and/or equipment. The cost of changes to the Contractor's procedure, as required, shall be at the Contractor's expense.

H. Survey Work: The land surveyor or professional engineer retained by the Contractor to provide survey services and to establish and monitor control points on and/or adjacent to existing buildings, structures, as specified, shall conduct such surveys during the course of this work and report these results to the Engineer as specified in Section 316000 Excavation Support and Protection.

1.7 DESIGN RESPONSIBILITY

A. Aggregate piers shall be designed and installed by the Contractor subject to the performance criteria and specifications established herein.

B. The Contractor's Engineer shall be engaged by the Contractor at his own expense. The Contractor's Engineer shall provide the design of the Compacted Aggregate Piers to provide the required foundation support for the building foundations and slabs.

C. The Contractor's attention is directed to the fact that acceptance of the Contractor's Engineer and/or his/her qualifications by the Owner and/or Engineer shall not be an overall approval of the Contractor's Engineer nor the aggregate pier design and methods of installation employed during the Work. It being understood that all system requirements necessary to accomplish the Work specified and/or indicated on the Drawings shall be designed by and installed under the direct supervision of the Contractor's Engineer who shall ultimately and fully bear the responsibility for that Work.

1.8 DELIVERY, STORAGE, AND HANDLING

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A. Deliver aggregate and necessary materials to Project site in such quantities and at such times to ensure continuity of installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials shall be in accordance with the approved shop drawings.

B. Aggregate used for element construction shall be pre-approved by the Contractor's Engineer and shall demonstrate suitable performance during modulus testing. Typical aggregate consists of Type 1 Grade B in accordance with ASTM D-1241-68, No. 57 stone, or other graded aggregate approved by the Contractor's Engineer.

C. Clean, potable water or other suitable source shall be used to mix grout and increase aggregate moisture content where required.

D. For grouted elements, grout shall consist of a homogeneous mixture of Type II Portland Cement and clean, potable water. Documentation for other additives shall be submitted for review.

PART 3 - EXECUTION

3.1 SITE CONDITIONS

A. The Geotechnical reports indicate the presence of obstructions within the subsurface soils. The Contractor shall take measures to install the aggregate piers below these obstructions. These measures shall include predrilling, preauguring, etc. .

B. The Contractor shall verify that all aggregate piers may be installed in accordance with all pertinent codes and regulations regarding such items as underground obstructions, right-of-way limitations, utilities, etc.

C.. In the event of a discrepancy, the Contractor shall notify the Owner. The Contractor shall not proceed with aggregate pier installation in areas of discrepancies until said discrepancies have been resolved.

3.2 MODULUS / LOAD TEST

A. Aggregate Pier Modulus Testing: Prior to the start of production pier installation, at least one modulus / load test shall be performed for each pier type installed to verify the parameters assumed during design. Tests shall be conducted in accordance with the procedures described herein and shall be located in the general area of the thickest organic deposit as indicated in the project test borings within the footprint of the proposed building. The location of the tests shall be subject to the approval of the Geotechnical Engineer.

1. The modulus testing shall be performed by the Contractor's Engineer

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and monitored by the Owner's Geotechnical Engineer. The tests shall consist of applying loads to a steel plate placed over the ground improvement pier and measuring deflection. The test plate shall have the same diameter as the aggregate pier design diameter.

2. Aggregate Piers shall be tested to 150 percent of the maximum design stress or higher if indicated on the aggregate pier design submittal. The maximum design stress indicated is that of the pier element, not the allowable bearing stress for footings. Modulus Test Procedures shall utilize appropriate portions of ASTM D 1143 and ASTM D 1194, as outlined below.
3. The modulus schedule shall be as follows unless an alternative schedule is requested by the Contractor's Engineer and approved by the Geotechnical Engineer:

Increment	Percent of the maximum design stress (%)	Minimum Duration (min)	Maximum Duration (min)
0	Initial Seating Load <9%	0	N/A
1	17%	15	60
2	33%	15	60
3	50%	15	60
4	67%	15	60
5	83%	15	60
6	100%	15	60
7	117%	60	120
8	150%	15	60
9	100%	15	N/A
10	66%	15	N/A
11	33%	15	N/A
12	0%	N/A	

4. Each load increment shall be held for the minimum duration shown. For each load increment the deflection of the top plate shall be measured. The top plate shall be located on top of the Aggregate Pier or on top of concrete cast on top of the Aggregate Pier.
5. If the rate of the Aggregate Pier deflection exceeds 0.01 inches per hour, the load shall be held in 15 minute increments until the rate of the Aggregate Pier deflection is less than 0.01 inches per hour (0.0025 inches per 15 minutes), or the maximum duration is reached.
6. Test Aggregate Pier deflections of each plate shall be measured using a minimum of two dial gauges graduated to 0.001 inches. Dial gauges shall be anchored to the loading jack base, with gauge plungers set on reference beams anchored at least two diameters from the Aggregate Pier.
7. The test jack, pump and pressure gauges shall have been calibrated within no longer than six months from the date of the test. If there are any questions regarding jack, pump and gauge accuracy, a confirmation calibration shall be performed after the modulus test.
8. The results of the modulus test shall be reported on a deflection versus stress graph. The Aggregate Pier modulus shall be calculated as the

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maximum design stress divided by the deflection of the top plate at the maximum design stress.

9. A telltale shall be installed at the bottom of the test element so that bottom-of-element deflections may be determined. For ungrouted/uncemented RAP elements, acceptable performance is indicated when the bottom of the element deflection is no more than 30% of the top of element deflection at the design stress level.

B. Upon completion of the modulus / load test, the Contractor shall submit a report summarizing the results of the test, and confirming that the test results indicate that the aggregate pier design is appropriate. The report shall be prepared by the Contractor's Engineer registered in Rhode Island, and, if successful, shall affirm that the pier design meets the performance criteria established herein.

C. If in the opinion of the Geotechnical Engineer, the results of modulus testing indicate that the installed piers do not meet the design parameters in the approved submittal, the Contractor's design shall be modified and an additional modulus test shall be conducted. Such additional modulus test(s) shall be completed at no additional cost to the Owner.

3.3 PIER INSTALLATION

A. Installation of compacted aggregate piers shall be in accordance with the approved submittal, and the pier design shall be confirmed by modulus testing. Piers not installed in accordance with the approved submittal, or which are not consistent with the results of modulus testing shall be reinstalled at no additional cost to the Owner.

B. Compacted aggregate piers shall be constructed by advancing a specially designed mandrel with a minimum 15 ton static force augmented by dynamic vertical ramming energy to the full design depth. The hollow-shaft mandrel, filled with aggregate, shall be incrementally raised, permitting the aggregate to be released into the cavity, and then lowered by vertically advancing and/or ramming to densify the aggregate and force it laterally into the adjacent soil. The cycle of raising and lowering the mandrel is repeated to the top of CAP element elevation. The cycle distance shall be determined by the Contractor's Engineer.

C. Special high-energy impact densification apparatus shall be employed to vertically densify the CAP elements during installation of each constructed lift. Densification shall be performed using a mandrel/tamper. The mandrel/tamper foot is required to adequately increase the lateral earth pressure in the matrix soil during installation. Downward crowd pressure shall be applied to the mandrel during installation. Pre-augering may be used to help the mandrel penetrate through relatively dense soil areas.

D. Pier installation shall be performed using displacement methods that do not generate spoils.

E. The Contractor shall provide layout (construction staking) of aggregate pier-supported

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foundations and slabs for this project. The Contractor shall provide ground elevations at each compacted aggregate pier in sufficient detail to estimate installation depth elevations to within 2 inches. Ground elevations shall be provided to the Compacted Aggregate Pier Installer in sufficient detail to estimate drilling depth elevations to within 3 inches.

F. The center of each pier shall be within six inches of the plan locations indicated. Piers installed outside of this tolerance and deemed not acceptable shall be rebuilt at no additional cost to the Owner.

G. The Contractor's Quality Control Representative shall immediately report any unusual conditions encountered during installation to the Owner and the Owner's Geotechnical Engineer. The quality procedures shall include the preparation of Compacted Aggregate Pier progress reports completed during each day of installation and containing the following information:

1. Footing and Compacted Aggregate Pier location.
2. Volume of aggregate introduced into the hopper (number of buckets).
3. Compacted Aggregate Pier installation depth.
4. Number of lifts.
5. Procedure to construct each lift
6. Time of mandrel raising and downward densification for each lift.
7. Total pier installation time.
8. Hydraulic pressures during installation (from installation or data record).
9. Base diameter and height of the remaining aggregate cone formed after constructing each pier and extracting the mandrel out of the ground.
10. Volume of aggregate used for pier construction (equal to the difference between the initial volume of aggregate introduced into the hopper and the volume of unused aggregate).
11. Planned and actual Compacted Aggregate Pier elevations at the top and bottom of the element (based on installation depth).
12. Type and size of hammer equipment used.
13. Aggregate description.
14. Record of flow rates of water or compressed air pressure (if applicable).
15. Documentation of any unusual conditions encountered.

3.4 REJECTION OF COMPACTED AGGREGATE PIERS

A. If an aggregate pier is installed in an incorrect location or exceeds the specified tolerances, the aggregate pier contractor shall replace the pier. Pier replacement may be avoided if alternate remedial procedures are approved by the Designer to the satisfaction of the Geotechnical Engineer. Unless the rejection is caused by obstruction, refusal in rock or dense soil or errors in the project drawings, the cost of all labor and material required for the replacement shall be the responsibility of the Contractor.

B. Any compacted aggregate pier installed without the presence of the Owner's Geotechnical Engineer shall be rejected and replaced with additional piers, at the discretion of the Owner and Owner's Geotechnical Engineer.

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3.5 EXCAVATION OF PIER TOPS AND UTILITES

A. Excavations conducted after compacted aggregate pier installation shall be performed such that the horizontal distance between the edge of any compacted aggregate pier and the nearest edge of the excavation is such that the pier is not affected. If installed compacted aggregate piers are located within the zone of influence of the excavation, the General Contractor and Engineer shall collaborate to develop solutions to excavation or construction methods that will avoid detrimental impact to the installed compacted aggregate piers. If excavation of grouted aggregate piers is required, excavation using the excavator bucket will not be permitted to contact the grouted aggregate pier. Final excavation shall be hand excavated and cut at the required invert unless approved by the project geotechnical engineer.

B. If the Contractor over-excavates or disturbs the grouted aggregate piers, the affected portions of the aggregate piers shall be treated with a cement-treated aggregate as approved by the Owner's Geotechnical Engineer.

C. If additional aggregate must be placed in excavation zones which have disrupted the structural continuity of the aggregate pier, then the operations, materials, equipment, and testing shall adhere to the following requirements:

1. Gradation of the aggregate shall meet specifications drafted by the Engineer.

2. The impact compaction equipment shall be motorized and the procedure shall ensure controlled placement of the aggregate.

3. Compaction of the aggregate shall reach 95% of the maximum dry density. The maximum dry density shall be determined by the modified Proctor method (ASTM D1557).

4. Placement and compaction shall be observed on-site by personnel from the Owner's Geotechnical Engineer. The Owner's Geotechnical Engineer shall also execute density testing on-site, and submit results of the density testing to the General Contractor and Engineer. Scheduling of excavation, placement, and compaction shall be determined by the General Contractor. The General Contractor will provide the aforementioned schedule to the Owner's Geotechnical Engineer and make arrangements for observation of placement and compaction, and execution of density testing.

3.6 BOTTOMS OF FOOTINGS

A. Prior to placement of structural fill, aggregate pier tops shall be excavated in a manner that will prevent the soil matrix surrounding the aggregate piers from softening, and ensure that a direct connection between the aggregate pier and structural fill will be achieved.

B. The following excavation procedures shall be followed:

1. Aggregate pier tops and surrounding soils shall be compacted with a motorized

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impact compactor. Tampers of the “sled” variety shall not be employed. The entire surface area shall be compacted to ensure that any loose surface soil and/or loose surface aggregate is densified.

2. Place specified structural fill and geogrid in accordance with the Section 312000, Earthwork.

C. The following criteria shall apply, and shall be verified by the Owner’s Geotechnical Engineer in a written report:

1. The area, where compacted aggregate piers have been installed, has been kept free of water. This will ensure that the unconfined matrix soil surrounding the aggregate piers has not been softened. Softening of the matrix soil may negatively impact the load bearing capability of the reinforced subgrade.

2. That the following specified procedures required prior to construction of the footings have been followed:

a. Recompaction, as required, of aggregate pier tops by mechanical impact compaction equipment.

b. Inspection of each aggregate pier top after installation and prior to placement of required structural fill.

c. Recompaction of aggregate pier tops that have or may have been disturbed by earthwork or other actions, to the satisfaction of the Geotechnical Engineer.

d. Assurance that no excavation has been made within a distance that will affect any completed pier, without being approved in writing by the aggregate pier contractor and Engineer.

END OF SECTION

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SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes hollow-metal work.

B. Related Requirements:

1. **Section 087100 "Door Hardware"** for door hardware for hollow-metal doors.

1.3 DEFINITIONS

A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 PRE-INSTALLATION MEETINGS

A. Pre-installation Conference: Conduct conference at **Project site**.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, core descriptions, **fire-resistance ratings, temperature-rise ratings,** and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door type.

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2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification:

1. For each type of exposed finish required, prepared on Samples of not less than 3 by 5 inches (75 by 127 mm).
2. For "Doors" and "Frames" subparagraphs below, prepare Samples approximately **8 by 10 inches (203 by 254 mm)** to demonstrate compliance with requirements for quality of materials and construction:

a. Doors: Show vertical-edge, top, and bottom construction; core construction; and hinge and other applied hardware reinforcement. Include separate section showing glazing if applicable.
b. Frames: Show profile, corner joint, floor and wall anchors, and silencers. Include separate section showing fixed hollow-metal panels and glazing if applicable.

E. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.

B. Oversize Construction Certification: For assemblies required to be fire rated and exceeding limitations of labeled assemblies.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.

1. Provide additional protection to prevent damage to factory-finished units.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

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C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch- (102-mm-) high wood blocking. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amweld International, LLC.
2. Apex Industries, Inc.
3. Ceco Door; ASSA ABLOY.
4. Commercial Door & Hardware Inc.
5. Concept Frames, Inc.
6. Curries Company; ASSA ABLOY.
7. Custom Metal Products.
8. Daybar Industries, Ltd.
9. DE LA FONTAINE.
10. Deansteel Manufacturing Company, Inc.
11. DKS Steel Door & Frame Systems, Inc.
12. Door Components, Inc.
13. Fleming Door Products Ltd.; Assa Abloy Group Company.
14. Gensteel Doors, Inc.
15. Greensteel Industries, Ltd.
16. HMF Express, LLC.
17. Hollow Metal Inc.
18. Hollow Metal Xpress.
19. J/R Metal Frames Manufacturing, Inc.
20. Karpen Steel Custom Doors & Frames.
21. L.I.F. Industries, Inc.
22. LaForce, Inc.
23. Megamet Industries, Inc.
24. Mesker Door Inc.
25. Michbi Doors Inc.
26. MPI Group, LLC (The).

B. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings **and temperature-rise limits** indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.

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1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.

B. Heavy-Duty Doors and Frames: SDI A250.8, Level 2.

1. Physical Performance: Level B according to SDI A250.4.
2. Doors:

   a. Type: As indicated in the Door and Frame Schedule.
   b. Thickness: 1-3/4 inches (44.5 mm.)
   c. Face: Metallic-coated steel sheet, minimum thickness of 0.042 inch (1.0 mm), with minimum A40 (ZF120) coating.
   d. Edge Construction: **Model 2, Seamless**.
   e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, mineral-board, or vertical steel-stiffener core at manufacturer's discretion.
   f. Core: **Polyisocyanurate**.

      1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) of not less than **2.1 deg F x h x sq. ft./Btu (0.370 K x sq. m/W)** when tested according to ASTM C 1363.

3. Frames:

   a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch (1.3 mm), with minimum A40 (ZF120) coating.
   b. Construction: **Full profile welded**.

4. Exposed Finish: **Prime**.

2.4 FRAME ANCHORS

A. Jamb Anchors:

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (51 mm) wide by 10 inches (254 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.
2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch (1.0 mm) thick.
3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.

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4. Post-installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch- (9.5-mm-) diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.

B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch (1.0 mm), and as follows:

1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch (51-mm) height adjustment. Terminate bottom of frames at finish floor surface.

2.5 MATERIALS

A. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than **25** percent.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.

D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.

E. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z (12G) coating designation; mill phosphatized.

1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.

F. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

G. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.

H. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.

I. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from slag or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

J. Glazing: Comply with requirements in Section 088000 "Glazing."

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K. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.6 FABRICATION

A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Hollow-Metal Doors:

1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch (0.66 mm), steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches (152 mm) apart. Spot weld to face sheets no more than 5 inches (127 mm) o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
2. Fire Door Cores: As required to provide fire-protection **and temperature-rise** ratings indicated.
3. Vertical Edges for Single-Acting Doors: **Bevel edges 1/8 inch in 2 inches (3.2 mm in 51 mm)**.
4. Top Edge Closures: Close top edges of doors with **flush closures** of same material as face sheets.
5. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
6. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
7. Astragals: Provide overlapping astragal on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch (19 mm) beyond edge of door on which astragal is mounted or as required to comply with published listing of qualified testing agency.
8. Head Anchors: Two anchors per head for frames more than 42 inches (1067 mm) wide and mounted in metal-stud partitions.
9. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.

    a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
    b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.

C. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.

D. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.

1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

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2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

E. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with **mitered** hairline joints.

1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.7 STEEL FINISHES

A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.8 ACCESSORIES

A. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

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A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.

B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.

1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

    a. At fire-rated openings, install frames according to NFPA 80.
    b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    c. Install frames with removable stops located on secure side of opening.
    d. Install door silencers in frames before grouting.
    e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    g. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

    a. Floor anchors may be set with power-actuated fasteners instead of post-installed expansion anchors if so indicated and approved on Shop Drawings.

3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
4. Concrete Walls: Solidly fill space between frames and concrete with mineral-fiber insulation.
5. In-Place Concrete or Masonry Construction: Secure frames in place with post-installed expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
6. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

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a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Steel Doors:

a. Between Door and Frame Jambs and Head: 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).
b. Between Edges of Pairs of Doors: 1/8 inch (3.2 mm) to 1/4 inch (6.3 mm) plus or minus 1/32 inch (0.8 mm).
c. At Bottom of Door: [**3/4 inch (19.1 mm)**] [**5/8 inch (15.8 mm)**] plus or minus 1/32 inch (0.8 mm).
d. Between Door Face and Stop: 1/16 inch (1.6 mm) to 1/8 inch (3.2 mm) plus or minus 1/32 inch (0.8 mm).

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.

1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (51 mm) o.c. from each corner.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow-metal work immediately after installation.

C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.

D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

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END OF SECTION 081113

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Rhode Island Convention Center Authority

Garrahy Courthouse Parking Garage # GCG2018

Project Permits Notice

As covered during the Pre-Bid meeting on February 21, 2018:

The Rhode Island Convention Center Authority (RICCA) is paying the State Fire Review Fee and State Building Permit Fee. These plan reviews are underway and should be completed by May 1, 2018.

The RICCA will be paying all Utility Back Charges relating to the relocation of the National Grid Duct Bank, Cox Communication Line and Providence Fire Communications line. The contractor is responsible for the installation of the new duct bank and communication conduits across the site as noted on the plans.

The RICCA will pay to the City of Providence all Fees related to the "offset of revenue" for the removal of the parking meters shown on the plans. The contractor will be responsible for removing the meters and returning them to the Parking Meter Department in the City of Providence.

Appendix H "Project Permits" listed in Project Manual, Book 2 lists the various permits that have been issued for the project to date. In addition, the RICCA has filed the Physical Alteration Permit application with the RIDOT, for work related to the RIDOT parcel along Friendship Street.

The contractor is responsible for paying all Road Opening, Curb Cut, sidewalk closing, Road Closing and police detail fees for the duration of the project.