


Noise and Vibration Mitigation Assessment: Pier 27 Phase 3 Noise and Vibration Impact Statement Buildings A & F Toronto, Ontario

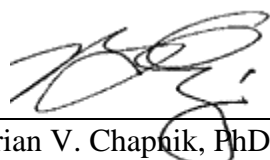
For

Pier 27 Toronto (Northeast) Inc.
56 The Esplanade, Suite 301
Toronto, ON
M5E 1A7

Prepared by


Adam Doiron, BASc, EIT

Reviewed by


Brian V. Chapnik, PhD, PEng

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1 INTRODUCTION AND SUMMARY

Howe Gastmeier Chapnik Limited (HGC Engineering) was retained by Pier 27 Toronto (Northeast) Inc. to complete a Noise and Vibration Impact Statement for Phase 3 of a proposed mixed-use development (the “Proposed Development”).

The Proposed Development is part of a larger development that comprises five buildings on the Pier 27 site (the “Site”) located south of Queens Quay, across from Freeland Street and east of Yonge Street. Three buildings on the Site, (Buildings B, D, and G) are constructed and occupied. Buildings B and D, 14-storey residential buildings, comprised Phase 1 of the development. Building G, a 35-storey residential tower with retail uses at grade, was constructed as Phase 2 of the development. Buildings A and F were previously approved each as 13-storey mixed-use buildings as part of the same Phase 2, but have not been constructed. HGC performed the acoustical assessments necessary for the approvals and construction of Phases 1 and 2. The revised proposal for Buildings A and F in Phase 3 comprises 11 and 45 storeys of mixed-use development, respectively.

Potential sources of transportation noise impacting the Site include rail traffic in the rail corridor to the north and road traffic on the Gardiner Expressway, Queens Quay East, Lake Shore Boulevard East, and several minor roadways to the north.

Redpath Sugar Ltd. (“Redpath”) is located immediately east of the Pier 27 development. It is recommended herein that the Site be classified as a Class 4 acoustical area under MECP NPC-300, similar to the Lower Yonge Precinct and other development lands in the area. While Redpath generates moderate levels of noise, it is not anticipated to adversely impact the Proposed Development under the criteria associated with a Class 4 designation, as described further herein.

Noise levels from the Gardiner Expressway, surrounding roadways and the rail corridor require that building envelope components have good sound insulation properties to limit traffic noise transmitted into the building to acceptable levels. Preliminary specifications for the glazing are outlined herein. Predicted sound levels in the amenity terraces exceed MECP targets; barriers to shield these terraces are suggested herein.

Based on the results of the East Bayfront Transit Environmental Assessment, vibration from the future LRT on Queens Quay is not expected to exceed criteria. No vibration control measures are anticipated to be required.

2 SITE AND AREA DESCRIPTION

The Site is located on the south side of Queens Quay, immediately adjacent to the south end of Freeland Street and east of Yonge Street. Lake Shore Boulevard East and the Gardiner Expressway are located north of the Proposed Development. The Bala and Kingston railway subdivisions are located north of the Gardiner Expressway (approximately 350 m from the north property line). A key plan is attached as Figure 1.

The Proposed Development consists of two mixed-use buildings A and F, which are 11 and 45 storeys tall respectively. In addition to the residential lobby, the ground floor of Building A will include a retail space and a daycare, with associated outdoor space. The ground floor of Building F will include retail space and indoor amenity, as well as the residential lobby. Residential suites are shown on levels 2-10 in both buildings, and amenity spaces (indoor and outdoors) are shown on the 11th floor (MPH/amenity level of Building A, and podium rooftop level of Building F). A residential tower extends above the 11th floor of Building F, with a mechanical penthouse above the 45th floor. The proposed site context plan is attached as Figure 2. This study has been conducted based on a set of architectural drawings (“SPA/OPA/ZBA Resubmission”) prepared by architectsAlliance (dated March 2021).

Redpath Sugar Ltd. operates an industrial facility (“Redpath”) west of Lower Jarvis Street and south of Queens Quay East. The facility operates 24 hours per day, 7 days per week. Sugar shipments are received in the Jarvis Street slip on the east side of the Redpath site, and are unloaded via a hydraulic crane. A current noise model of the Redpath facility was provided by Redpath’s acoustical consultant for use in this study.

3 NOISE AND VIBRATION CRITERIA

3.1 Road and Rail Noise

Criteria for acceptable levels of traffic noise are contained in the Ontario Ministry of Environment, Conservation, and Parks (“MECP”) publication NPC-300, "Environmental Noise Guideline: Stationary and Transportation Sources - Approval and Planning", October 2013 [1]. Sound level limits from road and rail traffic sources are summarized in Table 1 below.

Table 1: Road/Rail Traffic Noise Criteria [dBA]

Area	Daytime L_{EQ} (16 hour)	Night-time L_{EQ} (8 hour)
Outdoor Living Area	55	--
Living or dining areas of residences	45 / 40	45 / 40
Sleeping Quarters (bedrooms)	45 / 40	40 / 35
Day Care Centre	45*/40*	45*/40*

*Supplementary limits, good-practice design objectives.

Daytime refers to the period between 07:00 and 23:00. Night-time refers to the period between 23:00 and 07:00. Living areas include dining rooms, dens, studies, kitchens, etc. Corridors and washrooms are usually not considered to be noise-sensitive areas.

The term "Outdoor Living Area" (OLA) is used in reference to an outdoor patio, a backyard, a terrace, or common areas associated with high-rise multi-unit buildings where passive outdoor recreation is expected to occur. Balconies with a depth of less than 4 meters (measured perpendicular to the building façade) are not considered OLAs under MECP guidelines, and accordingly the noise criteria are not applicable there.

In cases where a minor excess (up to 5 dB) over the sound level limit in an OLA is anticipated, MECP guidelines allow the excess to be addressed by including a warning clause in the titles, deeds or tenancy agreements for the affected dwellings. Where OLA sound levels exceed 60 dBA, physical noise control measures, such as an acoustical barrier, are required. Note that not all OLAs necessarily require protection, if there are other protected outdoor areas accessible to the residents.

With respect to the building envelope, no controls are required where levels are under 50 dBA. Where the road traffic noise level (L_{EQ}) is greater than 60 dBA at night or 65 dBA during the day, windows must be designed to achieve the indoor sound level criteria listed above.

Otherwise, any glazing meeting the Ontario Building Code is considered adequate under MECP guidelines. Where the predicted night time and/or daytime sound levels exceed these thresholds, central air conditioning is required so that windows can remain closed against the noise.

The indoor sound level limits for rail sources are 5 dB more stringent than for road sources, to account for the additional low-frequency (rumble) components of locomotives, hence the façade sound insulation requirements are calculated separately and then combined.

3.2 Rail and Streetcar Vibration

Guidelines published by the railway authorities require that a vibration assessment be performed for any dwelling within 75 m of a railway right-of-way. As the Site is located further than 200 m from the rail corridor, vibration impacts from the rail corridor have not been assessed.

As part of the East Bayfront Transit Environmental Assessment [2a], Queens Quay is proposed to be redeveloped to include streetcar/LRT traffic. Vibration criteria and assessment methodologies are outlined in an appendix to the Environmental Assessment [2b], suggesting that vibration levels will be acceptable at any location that is more than 15 m from the future tracks.

3.3 Stationary Noise Sources

Industrial or commercial facilities or activities are referred to as stationary sources. Noise impacts from such sources may also be assessed under MECP guideline NPC-300. According to the City of Toronto Municipal Code, Chapter 591 (Noise), this same guideline would be applicable under the by-law unless the stationary source is in compliance with a provincial Environmental Compliance Approval (ECA), in which case no restrictions apply. As Redpath has a valid ECA, the City noise by-law does not apply.

In general, for assessments performed under NPC-300, sound level limits for stationary sources of sound are specified to be equal to the background sound from road traffic during the same time of day (or night) that the source may operate, subject to certain minimum exclusionary values which depend on the nature of the acoustic environment in the area of the site.

NPC-300 defines a Class 4 acoustical environment as an area or specific site that would otherwise be defined as Class 1 or 2 and which:

- Is an area intended for development with new noise-sensitive land use(s) that are not yet built;
- Is located in proximity to existing, lawfully established stationary source(s); and
- Has formal confirmation from the land use planning authority with the Class 4 area classification which is determined during the land use planning process.

With the exception of confirmation from the land use planning authority (the City of Toronto in the case of the current applications), the Proposed Development meets the requirements outlined above. It is recommended that the land use planning authority approve a Class 4 categorization for this Site as provided for in NPC-300, similar to the classification applied to the Lower Yonge Precinct to the north and several other developments in the vicinity of Redpath.

For a Class 4 area, the exclusionary minimum limits that apply at receptor locations on facades where the background sound may be low are 55 dBA during the night, and 60 dBA during the day; in outdoor living areas, the limit is 55 dBA (daytime only). Note that the noise limits apply at any noise sensitive receptor, and are determined based on measurement or prediction of the background one-hour energy equivalent sound level ($L_{EQ(1hour)}$).

All residential uses are considered to be noise sensitive receptors. Most retail/commercial uses are not generally considered to be noise sensitive, however it is possible for some noise sensitive institutional uses to be integrated (e.g. the proposed day care). The outdoor play area associated with the day care is not a point of reception under NPC-300, and thus does not require assessment.

4 TRANSPORTATION NOISE

4.1 Road Traffic Data

Traffic data for the key roads throughout the site area and surrounding the site were obtained from HGC Engineering's project files, originally obtained from the City of Toronto Traffic Data Centre & Safety Bureau (selected data is reproduced in Appendix A), as well as traffic volumes contained in a recent study conducted for the LCBO lands, obtained from the City of Toronto Development Applications website. These data were provided as 8 hour turning movement counts and as 24-hour counts, or AM/PM peak hour counts. With the exception of Queens Quay, traffic volumes on all roadways were conservatively assumed to grow at a typical rate of 2.5% per year on all roadways, and average future daytime (07:00 to 23:00) and night-time (23:00 to 07:00) hourly volumes that will exist in 10 years (2031) were then calculated. To determine day and night traffic flows, the 24-hour counts were applied directly. Traffic volumes used in this assessment generally correspond well to the forecasted data contained in the traffic study for the development; any minor discrepancies are anticipated to have a negligible overall effect on noise impacts at the Proposed Development.

As part of the East Bayfront Transit Environmental Assessment, Queens Quay is proposed to be redeveloped to reduce the number of lanes to two (one in each direction). The projected future road traffic for Queens Quay East has been determined from the East Bayfront Transit Class Environmental Assessment Traffic Assessment, January 2010 [2a]. Traffic volume forecasts were established for two design alternatives for the AM and PM peak hours. The forecasted AM and PM peak hour traffic volumes were compared to the existing AM and PM peak hour traffic volumes to determine a suitable growth factor (about 2.5%).

The resulting future traffic volumes are listed in Table 2, in addition to calculated and/or assumed commercial vehicle (truck) percentages and the posted speed limit for each roadway.

Table 2: 2031 Projected Road Traffic Data

Location	Daytime (Avg hr)		Nighttime (Avg hr)		
	Traffic Count	Truck %	Traffic Count	Truck %	
Freeland N of Harbour	290	4	65	4	50
Freeland S of Harbour	92	4	20	4	50
Cooper N of Harbour	538	4	120	4	50
Cooper S of Harbour	120	4	27	4	50
Harbour - East of Yonge	896	4	199	4	50
Harbour E of Freeland	727	4	162	4	50
Harbour E of Cooper	312	4	69	4	50
Harbour E of New Street	244	4	54	4	50
New Street N of Harbour	68	4	15	4	50
New Street S of Harbour	141	4	31	4	50
Yonge North of Harbour	506	4	113	4	50
Yonge South of Harbour	162	4	36	4	50
Queen's Quay	976	7.5	344	7.5	50
Lakeshore Westbound	1790	10	428	10	60
Lakeshore Eastbound	1060	10	266	10	60
Lower Jarvis	1191	10	238	10	50
Upper Jarvis	2386	4	842	4	50
Gardiner West bound	4991	13*	1234	13*	90
Gardiner East bound	5241	13*	1430	13*	90

* Assumed truck percentage based on road classification. Regional roads, municipal roads, and non 400-series highways 13% trucks.

4.2 Rail Traffic Data

Rail traffic data were obtained from the relevant authorities, and is contained in Appendix A.

The data was escalated to the year 2031 at an assumed growth of 2.5%/year. The rail volumes used in the analysis are summarized in Table 3.

Table 3: 2031 Projected Rail Traffic Data

Type of Train	No. of engines (max)	No. of cars (max)	No. of Trains Daytime (07:00-23:00)	No. of Trains Night-time (23:00-07:00)	Speed (mph)
Freight	4	140	12	7	15
Way Freight	2	25	7	2	15
Passenger	2	15	37	2	30
GO – Diesel	2	12	155	26	50
GO – Electric*	2	12	554	119	50

*All GO trains modelled as having diesel locomotives as per correspondence with Metrolinx personnel

4.3 Queens Quay Streetcar/LRT

As indicated in the East Bayfront Transit Environmental Assessment, Queens Quay is proposed to be redeveloped to include streetcar/LRT service. The EA [2b] contains a noise assessment of the proposed streetcar line, with predicted sound levels at a number of receptor locations. The associated emission levels were included in the analysis described below.

4.4 Toronto Island Airport

Recent Noise Exposure Forecast (“NEF”) contours for the Toronto City Centre Airport were obtained from a report prepared for Transport Canada in 2015. The NEF contours indicate that the development is outside the NEF 25 contour and therefore does not require a detailed assessment with respect to airport traffic noise.

4.5 Noise Predictions

To assess the levels of traffic noise that will impact the Site, predictions were made using a numerical computer modelling package (*Cadna-A version 2020 MRI*). The model is based on the methods from ISO Standard 9613-2.2, “*Acoustics - Attenuation of Sound During Propagation Outdoors*”, which accounts for reduction in sound level with distance due to geometrical spreading, air absorption, ground attenuation and acoustical shielding by intervening structures. Surrounding buildings currently under construction were included in the model, but other developments in the area for which construction has not yet begun have been modeled as “acoustically transparent”.

The road noise sources have been included in the model using the basic road element included in *Cadna-A*, which follows the German guideline *RLS-90* for road traffic noise predictions. Sound level monitoring conducted over seven days near the Gardiner Expressway indicates maximum traffic sound levels on the order of 3-5 dBA lower than predicted. Appropriate adjustments to the analysis were determined by comparing the sound levels monitored to the noise levels predicted using traffic corresponding to the same time period. The assessment herein includes adjustments of -5 dBA and -3 dBA to future average hour traffic sound levels from the Gardiner Expressway for daytime and nighttime periods, respectively.

The rail lines were included in the model as line sources with sound power levels equivalent to those published by the Department of Transportation (United States of America) Federal Transit Administration (FTA) in the publication entitled, “*Transit Noise and Vibration Impact Assessment Manual*”. The streetcar/LRT line was included in the model as a line source with sound power levels based on the emission levels and traffic volumes from the EA [2a/2b].

The model was used to predict traffic noise levels at each of the building facades and at each of the outdoor living areas. Predicted sound levels at each of the building façades are shown in Figures 3-6. A breakdown of the partial maximum sound level contributions at each façade and in the outdoor amenity areas is shown in Table 4 below.

Table 4: Traffic Sound Level Predictions, Typical Day/Night Hour [dBA]

Location Description	Daytime (16-hr avg)				Night Time (8-hr avg)			
	Road	Rail	Future LRT	Total	Road	Rail	Future LRT	Total
Building A								
North Façade	69	64	54	70	64	60	48	66
East Façade	66	63	50	68	62	59	45	63
South Façade	61	62	39	64	56	58	34	60
West Façade	65	60	50	66	61	56	44	62
Building F - Podium								
North Façade	69	63	54	70	65	59	46	66
East Façade	67	6163	52	69	62	60	45	65
South Façade	56	54	38	58	52	51	32	54
West Façade	66	58	50	66	61	54	44	62
Building F - Tower								
North Façade	67	63	48	69	63	60	42	65
East Façade	65	62	48	67	61	58	39	63
South Façade	55	53	36	57	51	49	30	53
West Façade	64	58	45	66	60	54	39	61

4.6 Results and Recommendations

Traffic from the surrounding roadways is the dominant source of noise in the area, with secondary contributions from the rail corridor. As seen in the results, the future LRT route is not expected to have a significant noise impact on the Proposed Development.

The following discussion outlines recommendations for building façade constructions to achieve the noise criteria stated in Table 1. Alternative ventilation requirements, protection of outdoor living areas and warning clauses are also discussed below.

4.6.1 Outdoor Living Areas (OLA)

The drawings indicate two common residential outdoor amenity spaces, on the rooftop of Building A (R1), and on the podium rooftop of Building F (R2) (Level 11 in both buildings). Outdoor amenity areas are highlighted on the site context plan (Figure 2).

Since the common outdoor amenity spaces on the 11th floors are provided for the use of all residents, private terraces and balconies in the development do not require assessment (and are less than 4 m deep in any case). The common outdoor amenity areas are subject to the MECP criteria outlined in Table 1. The outdoor play area for the daycare on the ground floor will not be used for passive outdoor recreation, and thus does not require assessment.

Assuming a standard 1.07 m high solid guard or parapet at the perimeter of each outdoor amenity space, predicted sound levels at receptors R1 and R2 are 66 dBA and 64 dBA. Extending the parapets with acoustical screens or barriers to 3.2 m high and 2.3 m high at the north side of Buildings A and F respectively, with 3 m long returns to the south along both sides, reduces the predicted sound level in the OLA's to 60 dBA. Such barrier heights are considered excessive, and are unlikely to be practical or warranted in the context of reasonable urban design in the downtown area. It is noted that this assessment does not include shielding from several planned or in-progress developments to the north as discussed above; these barrier configurations and heights should be revisited during detailed design.

4.6.2 Ventilation Requirements

The predicted night-time sound levels at most of the building façades exceed 60 dBA, and thus a central air conditioning system is required so that windows may remain closed. Such a system is expected to be provided in any case.

4.6.3 Building Constructions

Since the floor plans and elevations have not yet been sufficiently developed for a detailed acoustical specification of the building envelope, the STC rating targets outlined below were determined based on the assumption that the typical window-to-floor ratio will not exceed 80% (i.e. 60% fixed, 20% operable windows, including glazed sliding patio doors). Different window-to-floor ratios may result in different STC rating requirements.

Based on these assumptions, the required minimum sound transmission class (STC) rating of window glazing required to achieve the target indoor sound level criteria for the residential units from road and rail traffic, considering the highest predicted sound level at the façades of the Proposed Development, is STC-35, which can be achieved using standard double-glazed sealed assemblies. Awning windows, and swing or sliding doors to balconies should have tight seals sufficient to achieve similar acoustical performance ratings.

Exterior wall assemblies are assumed to have sufficient sound insulation such that sound transmitted through them is negligible in comparison with the glazing. Precast or masonry exterior walls are expected to meet these requirements, as are spandrel or metal panels backed by an independent drywall assembly.

Similar to the specification for barrier heights given above, these building envelope performance requirements should be considered once floor plans and building elevations are finalized, and additional screening from currently planned developments can be considered.

4.7 Warning Clauses

MECP guidelines recommend that appropriate warning clauses be used in the Development Agreements and in purchase, sale and lease agreements (typically by reference to the Development Agreements), to inform future owners and occupants about potential noise concerns from sources in the area. The actual wording of the warning clause depends on the nature of the excess. For residential suites in this development (or noise-sensitive commercial uses, where applicable), two clauses warning against transportation noise are recommended as follows:

- (a) Purchasers/tenants are advised that despite the inclusion of noise control features in the development and within the building units, sound levels due to increasing road/LRT and rail traffic may on occasion interfere with some activities of the dwelling occupants as the sound levels exceed the Municipality's and the Ministry of the Environment, Conservation and Parks' noise criteria.
- (b) This dwelling unit has been supplied with a central air conditioning system which will allow windows and exterior doors to remain closed, thereby ensuring that the indoor sound levels are within the sound level limits of the Municipality and the Ministry of Environment, Conservation and Parks.

These sample clauses are provided by the MECP as examples and can be modified by the owner's legal representative, in consultation with the City, as required.

In addition, Metrolinx and CNR generally require specific warning clauses to protect their interests if a site is close to a major railway corridor. Wording for such a clause is included in the guideline document provided in Appendix B, and reads as follows:

Warning: <Canadian National Railway Company> <Metrolinx> or its assigns or successors in interest has or have a rights-of-way within 300 metres from the land the subject hereof. There may be alterations to or expansions of the railway facilities on such rights-of-way in the future including the possibility that the railway or its assigns or successors as aforesaid may expand its operations, which expansion may affect the living environment of the residents in the vicinity, notwithstanding the inclusion of any noise and vibration attenuating measures in the design of the development and individual dwelling(s). <CNR> <Metrolinx> will not be responsible for any complaints or claims arising from the use of such facilities and/or operations on, over or under the aforesaid rights-of-way.

These sample clauses are provided by the MECP as examples and can be modified by the owner's legal representative, in consultation with the City, as required.

5 STATIONARY (INDUSTRIAL) NOISE SOURCES

Redpath Sugar Ltd., a large sugar refining plant, is located immediately east of the Site. Redpath is a major industrial facility, generally considered to be a "Class III" industry under MECP guidelines. It regularly operates 24 hours per day, 7 days per week. All sources are assumed to operate on a consistent or similar basis during both daytime and night-time hours, hence night-time impacts are generally of greater concern, as the background sound levels and exclusionary sound level criteria are lower during the night. Sound level criteria are discussed above in Section 3.3.

An electronic (*Cadna-A*) noise model of the Redpath facility is maintained by Redpath. The current noise model, contained in the file "*Redpath Updated Model 2020-12-18 v2020.cna*" was provided for use in this study. The model was used to conduct an assessment of the Proposed Development against the NPC-300 "Class 4" area criteria. The overall acoustical model includes the following specific parameters:

- Building reflections with absorption of 0.2;
- Developments which are completed or under construction are included;
- Developments which are planned but not yet approved are included only with respect to potential for reflections (no shielding).

The results of the assessment indicate a maximum sound level prediction of 53 dBA, at the upper east facade of Building F (predicted levels are shown in Figure 7). Predicted sound levels at the outdoor amenity terraces at Buildings A and F are 45 dBA and 43 dBA respectively. These results are within the MECP exclusionary criteria for a "Class 4" area. Thus, noise impacts from

the Redpath facility are anticipated to comply with the applicable MECP guidelines at the Proposed Development under the recommended Class 4 classification.

In the above assessment, one noise source in the Redpath model which is located on a ship docked in the Jarvis Street slip was “turned off”, as such sources are not included in considering Redpath’s compliance under MECP approvals. However, this source only has minimal impact on the Proposed Development; the maximum predicted sound level at Building F only increases by 1 dB (to 54 dBA) with this noise source included.

5.1 Warning Clauses

While no physical controls are required to limit noise from Redpath, a suitable warning clause should be registered on the development agreements. The wording of this clause is similar to that included for Phase II of the development, and is as follows:

“Warning: This site is immediately adjacent to the heavy industrial Redpath Sugar Ltd. refinery located at 95 Queens Quay Boulevard East (the “Redpath Facility”) which operates 24 hours a day, 7 days a week. Various processes, shipping and receiving operations may either operate continuously or at any time of day or night. Activities may include: loading, unloading and repair of large tractor trailers or bulk bin trucks; docking and unloading of ocean and lake going ships; venting of steam; construction and repair; and operation of various sugar refining processes; and permitted electrical co-generation facilities. In addition, there may be industrial odours and light emanating from the refinery from time to time. Redpath may apply to alter or expand the Redpath Facility in the future. Notwithstanding the inclusion of certain mitigation features within this development to lessen potential noise, air emissions, dust, odour, vibration, and visual impact from the Redpath Facility, from time to time noise from the Redpath Facility is likely to be audible, odours may be unpleasant, and dust and light emissions may be bothersome and such potential noise, air emissions, dust, odour, vibration and visual impact may impact the enjoyment of indoor and outdoor areas of this development. Redpath Sugar Ltd. advises that it will not be responsible for any complaints or claims arising from any of the activities at or relating to the Redpath Facility property or operations thereon.”

This warning clause should be included in the condominium disclosure statement and declaration applicable to each building on this site. The specific wording of warning clauses may be modified as required in response to comments from the City and/or any of the circulated stakeholders.

5.2 Additional Mitigation

As with earlier phases of the Pier 27 development, additional safeguards to ensure that the Proposed Development is constructed in the manner contemplated by the noise modelling may be explored in consultation with the City's reviewer and taking into account comments from Redpath. For example, in both Phase 1 (Buildings B and D) and Phase 2 (Building G), certain building restrictions, features, projections, and/or orientations were secured through the zoning approval to ensure a suitable noise environment for the development. Additionally, certain studies and opinions were required at the building permit and occupancy stages of the development to verify the inclusion of the required mitigation features. These requirements were secured variously in the zoning by-law/minor variances applicable to the development as well as in agreements under the Planning Act that are registered on title to the site.

For Phase 3, it is expected that certain restrictions and design features can be secured through the zoning by-law amendment itself (e.g. maximum building heights and minimum building setbacks) or through site plan conditions and site plan drawings (e.g. barriers around amenity space, STC classifications of windows).

6 VIBRATION ASSESSMENT

As the site is greater than 75 m from the rail corridor, a vibration assessment of the rail corridor is not required.

Queens Quay is proposed to be redeveloped as part of the waterfront revitalization. The redevelopment could include streetcar traffic. As part of the East Bayfront Transit Environmental Assessment, vibration from streetcar pass-bys was assessed. The predictions indicate that the vibration levels will be below the applicable guideline limit where receptors are greater than 15 m from the track centerline. The distance from the proposed building facades to the track centerline is anticipated to be greater than 15 m, considering the base of the proposed buildings will be approximately 13 m from the north property line. Thus, no significant vibration impacts on the Proposed Development are anticipated.

7 IMPACT OF THE DEVELOPMENT ON THE ENVIRONMENT

It is expected that any increase in local traffic associated with the Proposed Development will not be substantial enough to affect noise levels significantly.

Sound levels from stationary (non-traffic) sources of noise such as rooftop air-conditioners, cooling towers, exhaust fans, etc. should not exceed the minimum one-hour L_{EQ} ambient (background) sound level from road traffic, at any potentially impacted residential point of reception, to comply with City of Toronto Municipal Code 591. Typical minimum ambient sound levels in the area are expected to be in the range of about 60-65 dBA during the day and 50-55 dBA at night for façades with exposure to the Gardiner Expressway. Minimum sound levels at more shielded facades are expected to be lower than the minimum exclusionary criteria defined by NPC-300. Thus any electro-mechanical equipment associated with this development (e.g. emergency generator testing, fresh-air handling equipment, etc.) should be designed such that they do not result in noise impact beyond these ranges.

8 IMPACT OF THE DEVELOPMENT ON ITSELF

Section 5.9.1 of the Ontario Building Code (“OBC”) specifies the minimum required sound insulation characteristics for demising partitions, in terms of Sound Transmission Class (“STC”) values. In order to maintain adequate acoustical privacy between separate suites in a multi-tenant building, inter-suite walls should meet or exceed STC-50. Walls separating a suite from a noisy space such as a refuse chute, or elevator shaft, should meet or exceed STC-55. In addition, it is recommended that the floor/ceiling constructions separating suites from any amenity or commercial spaces also meet or exceed STC-55. Tables 1 and 2 in Section SB-3 of the Supplementary Guideline to the OBC provide a comprehensive list of constructions that will meet the above requirements.

Tarion’s Builder Bulletin B19R requires the internal design of condominium projects to integrate suitable acoustic features to insulate the suites from noise from each other and amenities in accordance with the OBC, and limit the potential intrusions of mechanical and electrical services of the buildings on its residents. Where B19R certification is needed, an acoustical consultant is required to review the mechanical and electrical drawings and details of demising constructions and mechanical/electrical equipment, when available, to help ensure that the noise impact of the development on itself is maintained within acceptable levels.

9 PHASE 3 NOISE AND VIBRATION IMPACT STATEMENT

The site is currently the subject of registered Planning Act Section 37 Agreements and Three Party Agreements involving Redpath. The Section 37 Agreement (section 8) and the Three Party Agreement (section 5) entered into in 2015 contain a requirement for a Noise and Vibration Impact Statement. This Noise and Vibration Impact Statement is to be approved by the Chief Planner, following a peer review and following comments from Redpath. For Phase 2 of the Pier 27 development, HGC submitted a “Noise and Vibration Impact Statement for the Proposed Redevelopment of Pier 27, Phase 2, City of Toronto, Ontario” dated November 15, 2011. This Noise and Vibration Impact Statement was supplemented by an addendum by HGC called “Pier 27, Phase 2, Addendum to Noise & Vibration Impact Statement” dated November 3, 2014.

The Section 37 and Three Party agreements require the Noise and Vibration Impact Statement to be updated at such time as a revised form of development is proposed for the site (see section 8.17 of the Section 37 Agreement) and after the passage of a specified period of time (see section 8.18 of the Section 37 Agreement). The agreements also specify where updates to existing models are required (see section 8.20 of the Section 37 Agreement).

In conjunction with the preparation of this Noise and Vibration Feasibility Study, the Noise and Vibration Impact Statement has been updated in accordance with this report as the “Noise and Vibration Impact Statement for the Proposed Redevelopment of Pier 27, Phase 3”:

Section 37	Three Party	Requirement	Response
s. 8.20	s. 5.20	The CADNA Model [“2014-09-30 Redpath Pier 27 VCL HGC Collaborative Model R1.cna”] shall be updated as necessary with respect to Redpath source information, ambient noise, the proposed Pier 27 development, and any other existing developments that could affect the propagation of sound to Pier 27 receptors (e.g. by way of reflections).	<p>The updated CADNA Model is “Redpath Updated Model 2020-12-18 v2020.cna”.</p> <p>The model has been updated with respect to Redpath source information, ambient noise, the proposed Pier 27 development, and other developments that could affect the propagation of sound to Pier 27 receptors.</p>

s. 8.2(a)	s. 5.2(a)	An analysis of the impact of the proposed development on the immediately surrounding area.	This analysis is set out in Section 7 of the Noise and Vibration Feasibility Study, Pier 27 Phase 3, Buildings A & F.
s. 8.2(b)	s. 5.2(b)	An analysis of the impact of the immediately surrounding area, including without limiting the foregoing, the industrial operations on the Redpath Lands on the proposed development.	This analysis is set out in Sections 4, 5, and 6 of the Noise and Vibration Feasibility Study, Pier 27 Phase 3, Buildings A & F.
s. 8.2(c)	s. 5.2(c)	An analysis of the impact of the proposed development on itself.	This analysis is set out in Section 8 of the Noise and Vibration Feasibility Study, Pier 27 Phase 3, Buildings A & F.
s. 8.2(d)	s. 5.2(d)	Such recommendations for noise and vibration mitigation or for adjustments to the site plan and architectural design, as are necessary to comply with NPC-300 as Amended and the noise and vibration control and environmental sound exposure objectives set out in the Foundation By-law, as such by-law is amended by the Proposed Zoning By-law Amendment, and in the 2009 Amended and Restated Section 37 Agreement, the 2015 Phase II Section 37 Agreement, and the 2015 Three Party Agreement.	<p>Recommendations for mitigation are set out in Sections 4.6, 4.7, 5.1, and 5.2 of the Noise and Vibration Feasibility Study, Pier 27 Phase 3, Buildings A & F.</p> <p>This report assesses recommendations for noise and vibration mitigation as are necessary to comply with NPC-300, having regard to the new development proposal for Building A and Building F of Phase 3. It is intended that appropriate mitigation measures and/or design features of the buildings can be secured through the zoning by-law amendment, the site plan and conditions, and other appropriate agreements to reflect the revised building design.</p>

10 CONCLUSIONS & SUMMARY OF RECOMMENDATIONS

Acoustic modelling has been undertaken to assess the noise impact of surrounding traffic sources on the Proposed Development for the Site in downtown Toronto. Preliminary recommendations for associated noise controls are provided in Section 4.6 above. Warning clauses are recommended to advise residents of future traffic noise from surrounding roadways, the LRT, and the rail corridor to the north.

A Redpath Sugar Ltd. facility (Redpath) is located east of the development. It is recommended herein that the Site be classified as a Class 4 area by the land use planning authority, as has been done for several other areas or sites in the vicinity of Redpath. While the Redpath facility generates moderate levels of noise, it is not anticipated to adversely impact the Proposed Development under the Class 4 criteria. Warning clauses will be required in any case.



ACOUSTICS



NOISE



VIBRATION

11 REFERENCES AND CITATIONS

- [1] Ontario Ministry of Environment (MOE) publication NPC-300, "Environmental Noise Guideline: Stationary and Transportation Sources - Approval and Planning", October 2013
- [2a] "East Bayfront Transit Class Environmental Assessment, Traffic Assessment, Queens Quay Design Alternatives", BA Group Transportation Consultants, January 2010.
- [2b] "Noise and Vibration Assessment, East Bayfront – Queens Quay East", RWDI Consulting Engineers, March 17, 2010.



ACOUSTICS



NOISE



VIBRATION



Figure 1: Key Plan

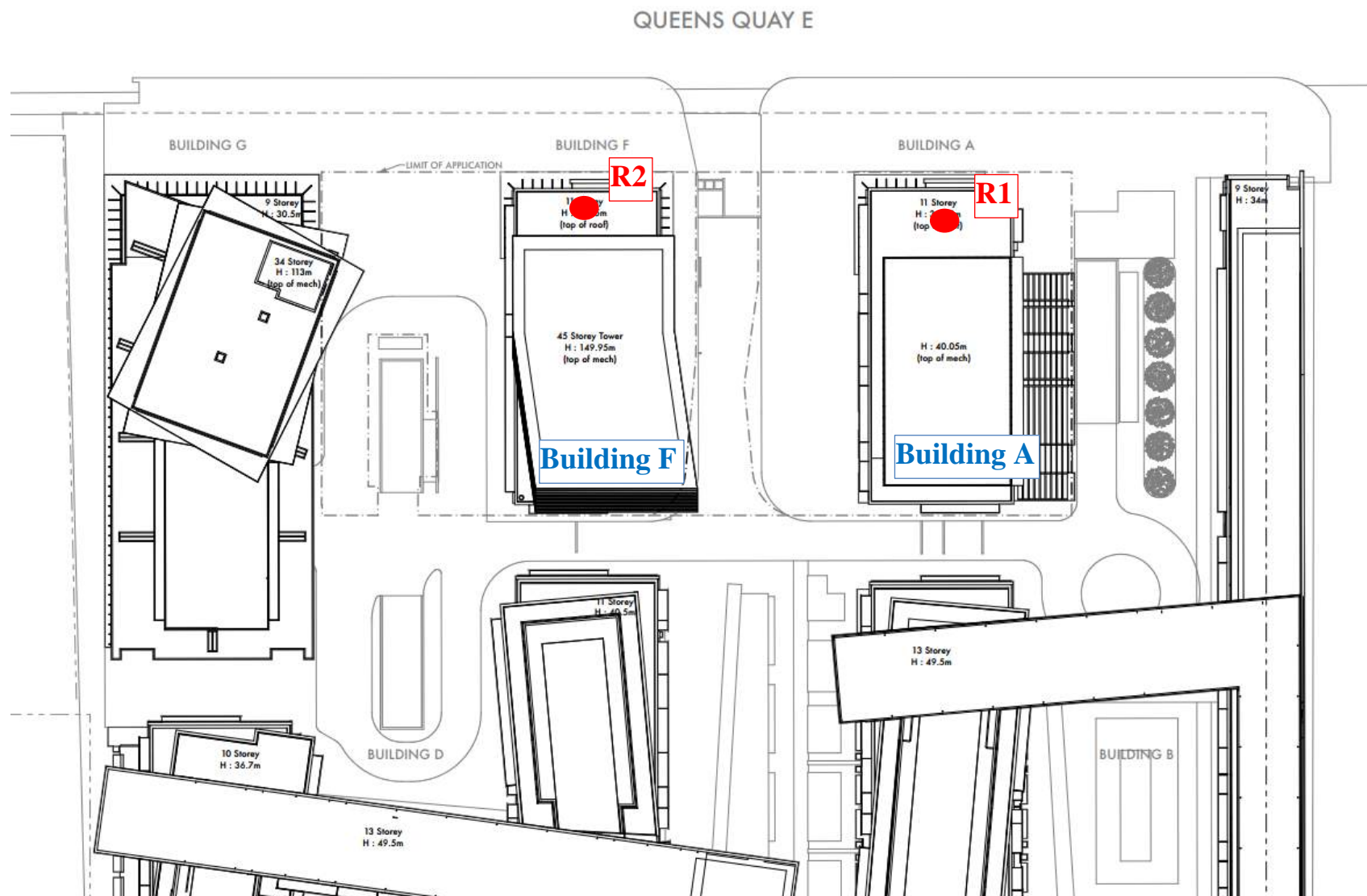


Figure 2: Site Context Plan

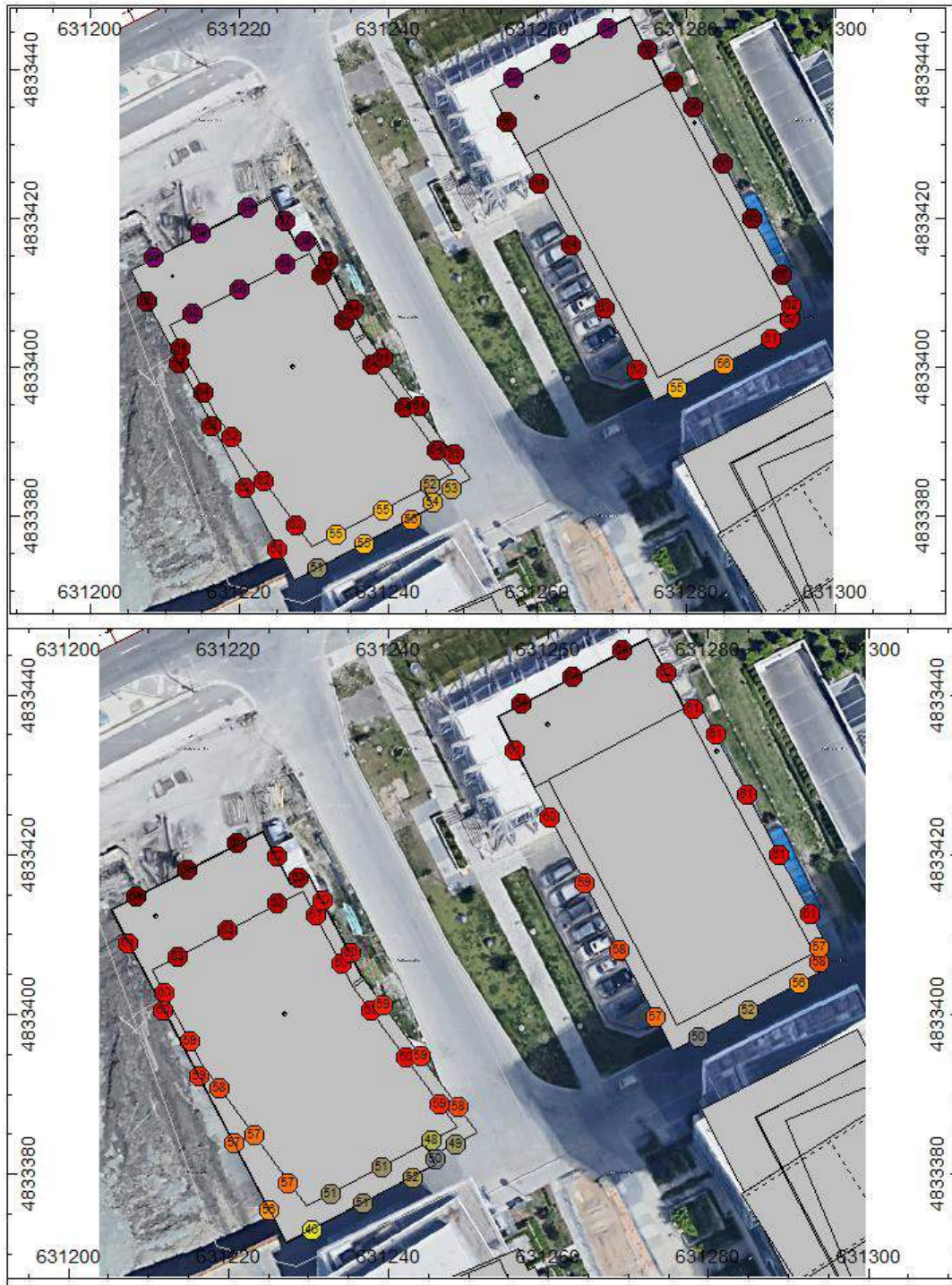


Figure 3: Sound Level Predictions, Road Traffic, Daytime (top), and Night Time (bottom)

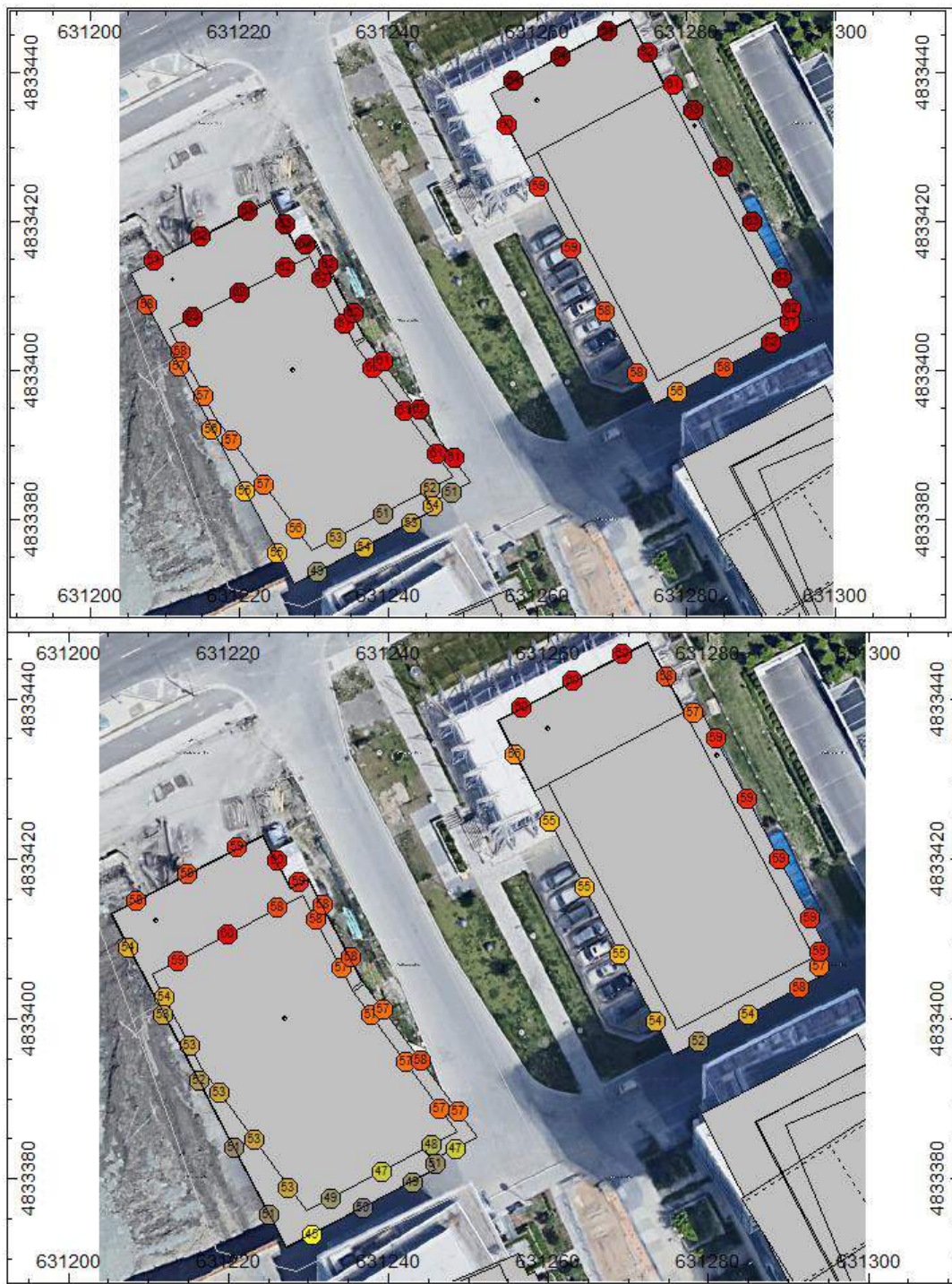


Figure 4: Sound Level Predictions, Rail Traffic, Daytime (top), and Night Time (bottom)

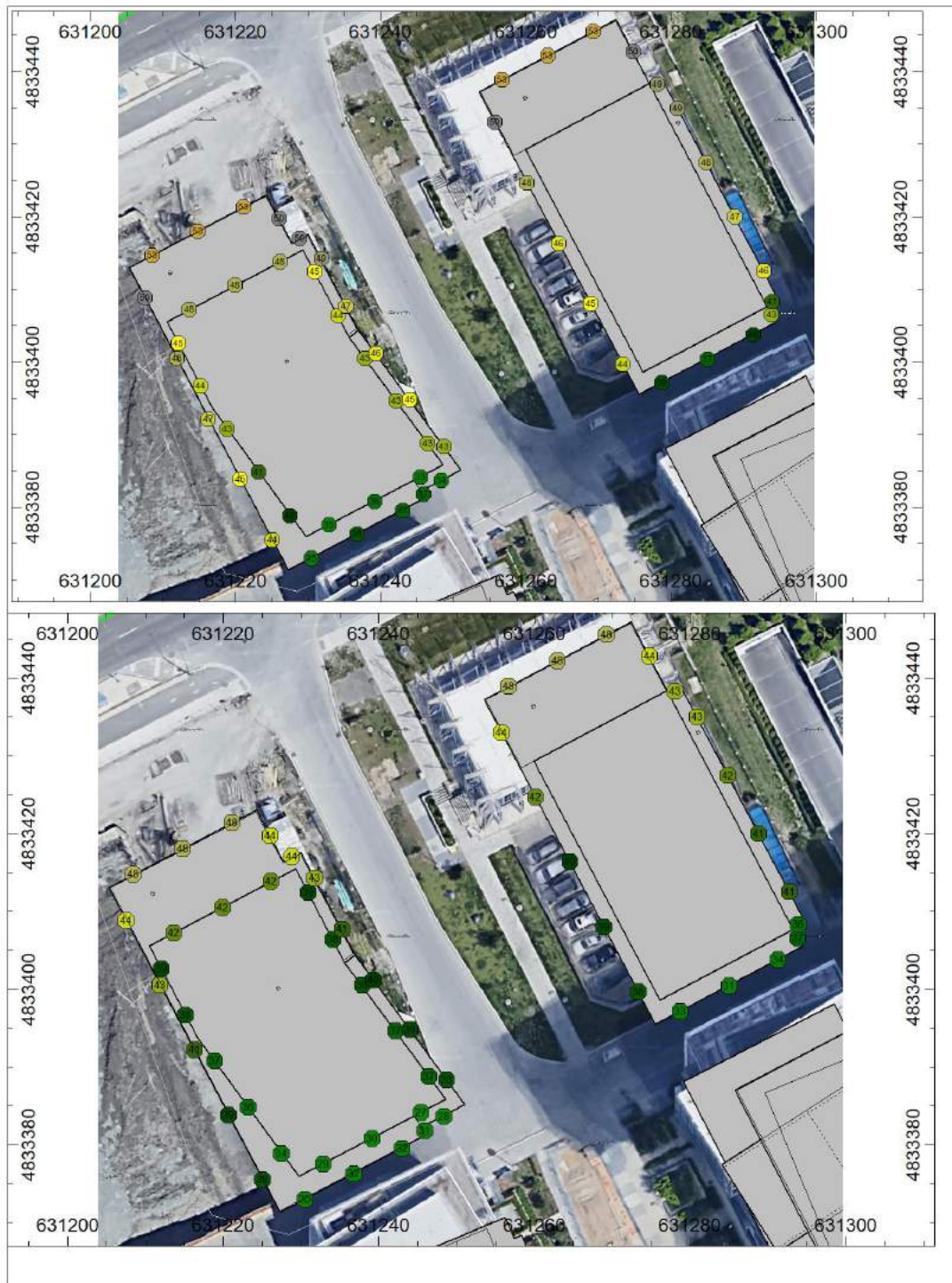


Figure 5: Sound Level Predictions, Future LRT, Daytime (top), and Night Time (bottom)

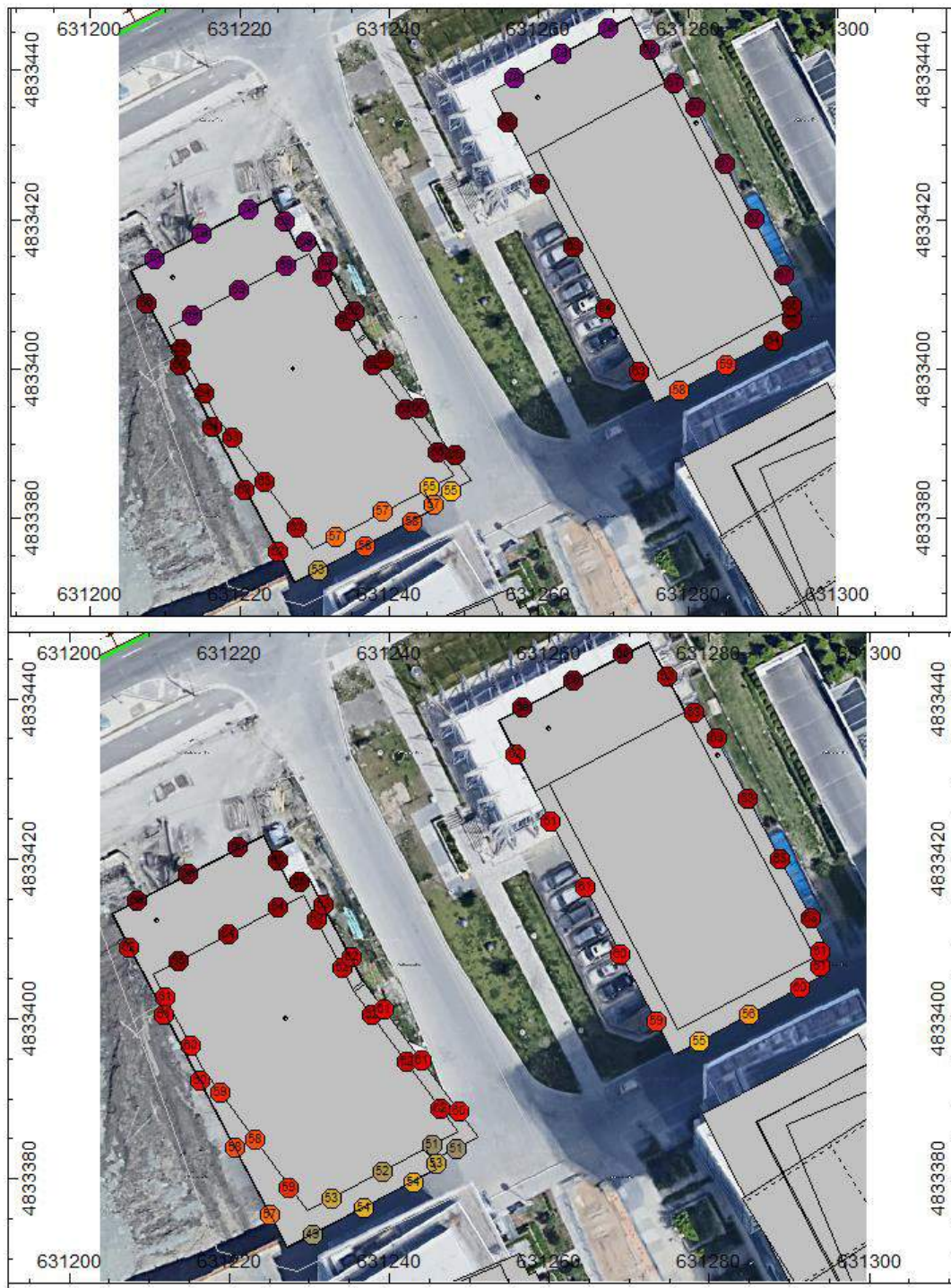


Figure 6: Sound Level Predictions, Total Traffic, Daytime (top), and Night Time (bottom)



Figure 7: Sound Level Predictions, Redpath, Daytime and Night Time

APPENDIX A: ROAD AND RAIL TRAFFIC DATA



ACOUSTICS



NOISE



VIBRATION

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Permanent Counting Station Summary Report

Location: LAKE SHORE BLVD W/B E OF LOWER JARVIS ST

Station Code:

Date Range: 2005/01/01 -2005/12/31

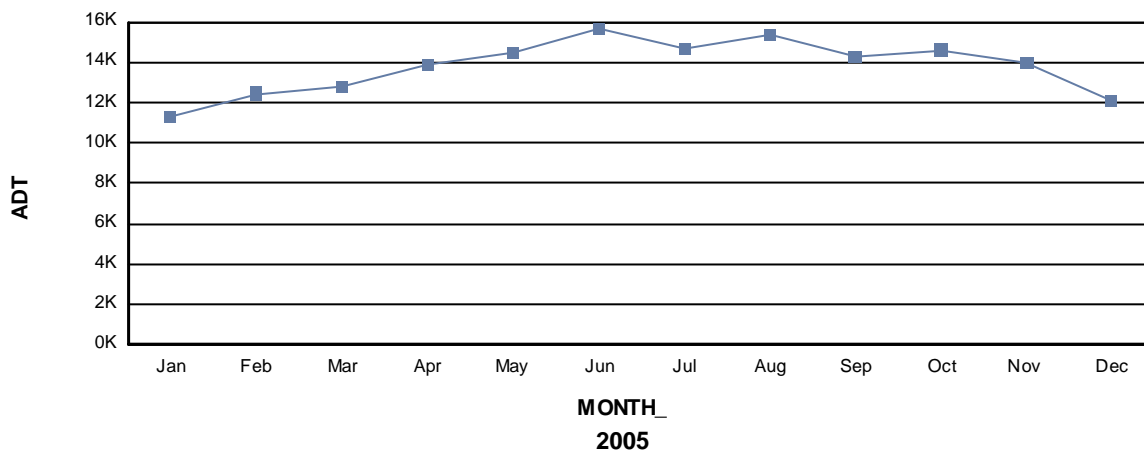
AADT: 13787.01

COUNT: 313

Variation of AADT by Month

MONTH	# COUNT	AVERAGE	VAR
January	28	11,312	82.05%
February	21	12,435	90.19%
March	27	12,799	92.83%
April	28	13,840	100.38%
May	30	14,476	104.99%
June	27	15,656	113.56%
July	20	14,680	106.48%
August	30	15,375	111.52%
September	25	14,284	103.60%
October	28	14,615	106.01%
November	18	13,988	101.46%
December	31	12,079	87.61%

Monthly Variation of AADT



Variation of AADT by Season

SEASON	SADT	%VAR
SPRING	14,641	106.20%
SUMMER	15,097	109.50%
FALL	14,339	104.01%
WINTER	12,220	88.64%

City of Toronto - Traffic Data Centre & Safety Bureau

Permanent Counting Station Summary Report

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AADT: 13787.01

COUNT: 313

Variation of Traffic Flow by Day and Month

MONTH	WEEKDAY	AVERAGE	% AADT	MONTH	WEEKDAY	AVERAGE	% AADT
Jan	SUNDAY	7,634	55.37%	Jul	SUNDAY	12,714	92.21%
Jan	MONDAY	11,667	84.62%	Jul	MONDAY	15,143	109.84%
Jan	TUESDAY	12,230	88.71%	Jul	TUESDAY	15,939	115.61%
Jan	WEDNESDAY	12,810	92.91%	Jul	WEDNESDAY	14,488	105.08%
Jan	THURSDAY	12,732	92.35%	Jul	THURSDAY	16,457	119.36%
Jan	FRIDAY	13,905	100.86%	Jul	FRIDAY	16,027	116.24%
Jan	SATURDAY	8,474	61.47%	Jul	SATURDAY	13,518	98.05%
Feb	SUNDAY	9,394	68.14%	Aug	SUNDAY	14,295	103.68%
Feb	MONDAY	11,480	83.26%	Aug	MONDAY	14,900	108.07%
Feb	TUESDAY	13,159	95.44%	Aug	TUESDAY	16,324	118.40%
Feb	WEDNESDAY	13,110	95.09%	Aug	WEDNESDAY	13,956	101.23%
Feb	THURSDAY	13,556	98.32%	Aug	THURSDAY	15,713	113.97%
Feb	FRIDAY	14,306	103.76%	Aug	FRIDAY	16,927	122.77%
Feb	SATURDAY	11,495	83.37%	Aug	SATURDAY	15,392	111.64%
Mar	SUNDAY	9,883	71.68%	Sep	SUNDAY	12,303	89.23%
Mar	MONDAY	12,131	87.99%	Sep	MONDAY	11,278	81.80%
Mar	TUESDAY	12,778	92.68%	Sep	TUESDAY	14,884	107.95%
Mar	WEDNESDAY	13,524	98.09%	Sep	WEDNESDAY	13,865	100.56%
Mar	THURSDAY	14,986	108.70%	Sep	THURSDAY	15,867	115.08%
Mar	FRIDAY	13,367	96.95%	Sep	FRIDAY	16,237	117.77%
Mar	SATURDAY	11,538	83.69%	Sep	SATURDAY	13,865	100.57%
Apr	SUNDAY	10,265	74.46%	Oct	SUNDAY	12,218	88.62%
Apr	MONDAY	13,876	100.65%	Oct	MONDAY	12,792	92.79%
Apr	TUESDAY	14,582	105.77%	Oct	TUESDAY	14,260	103.43%
Apr	WEDNESDAY	14,703	106.64%	Oct	WEDNESDAY	15,451	112.07%
Apr	THURSDAY	15,320	111.12%	Oct	THURSDAY	13,170	95.53%
Apr	FRIDAY	16,044	116.37%	Oct	FRIDAY	16,264	117.96%
Apr	SATURDAY	12,153	88.15%	Oct	SATURDAY	17,904	129.86%
May	SUNDAY	11,775	85.41%	Nov	SUNDAY	9,738	70.63%
May	MONDAY	13,180	95.59%	Nov	MONDAY	14,014	101.65%
May	TUESDAY	14,567	105.65%	Nov	TUESDAY	14,826	107.53%
May	WEDNESDAY	15,970	115.83%	Nov	WEDNESDAY	15,099	109.52%
May	THURSDAY	15,937	115.60%	Nov	THURSDAY	14,244	103.31%
May	FRIDAY	16,341	118.52%	Nov	FRIDAY	15,458	112.12%
May	SATURDAY	14,557	105.59%	Nov	SATURDAY	12,699	92.11%
Jun	SUNDAY	15,141	109.82%	Dec	SUNDAY	8,465	61.40%
Jun	MONDAY	15,681	113.73%	Dec	MONDAY	11,917	86.43%
Jun	TUESDAY	16,004	116.08%	Dec	TUESDAY	12,524	90.84%
Jun	WEDNESDAY	16,719	121.27%	Dec	WEDNESDAY	13,149	95.37%
Jun	THURSDAY	17,078	123.87%	Dec	THURSDAY	13,696	99.34%
Jun	FRIDAY	16,493	119.62%	Dec	FRIDAY	13,866	100.58%
Jun	SATURDAY	12,475	90.49%	Dec	SATURDAY	10,481	76.02%

City of Toronto - Traffic Data Centre & Safety Bureau

Permanent Counting Station Summary Report

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AADT: 13787.01

COUNT: 313

Hourly Avg Volume of Traffic by Month - Weekday

Beginning Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	107.20	108.47	141.20	144.11	149.68	180.84	239.45	178.41	139.94	160.28	150.07	119.23
1	81.30	88.13	95.70	130.63	107.68	146.28	204.18	148.81	106.78	112.17	109.71	111.27
2	55.20	60.67	64.52	65.21	66.27	81.53	111.36	88.24	71.39	60.61	76.79	73.73
3	52.20	51.00	58.43	54.95	58.86	57.63	93.45	74.62	60.72	49.00	58.86	62.14
4	56.00	58.33	60.19	53.32	63.64	64.63	95.45	87.05	61.50	59.11	58.14	56.59
5	90.10	88.13	91.43	103.42	112.27	104.37	132.73	111.19	99.56	104.11	96.57	83.18
6	279.05	294.60	283.71	324.21	340.09	371.58	355.64	314.14	312.39	318.39	335.79	274.32
7	554.10	600.40	590.81	622.00	651.77	735.53	637.09	618.33	686.22	694.11	765.71	546.41
8	1,105.55	1,146.80	1,115.95	1,199.42	1,277.41	1,414.68	969.33	1,059.33	1,230.28	1,338.61	1,413.00	1,065.00
9	975.40	947.13	963.14	1,013.05	1,061.36	1,049.37	902.75	886.32	981.06	1,004.72	1,055.50	886.36
10	666.80	679.93	699.52	740.16	728.05	776.67	755.75	860.05	749.22	700.50	770.43	662.64
11	653.05	657.40	694.57	788.95	765.41	799.00	850.17	919.95	834.06	743.00	749.08	722.14
12	700.90	744.33	763.90	827.26	761.00	866.39	874.75	938.00	857.61	813.61	790.00	789.73
13	693.50	731.80	775.33	844.37	840.91	888.58	885.83	926.05	839.00	821.67	783.43	795.68
14	762.35	817.93	822.57	902.79	886.05	994.26	1,002.17	976.52	948.11	892.11	931.29	858.77
15	856.15	927.87	919.48	1,044.26	1,002.59	1,108.16	1,051.50	1,154.24	1,047.35	1,003.84	1,028.71	966.05
16	943.25	985.53	976.29	1,089.05	1,114.00	1,169.79	1,070.58	1,083.57	1,047.72	1,080.00	1,111.79	982.73
17	1,018.05	1,040.67	1,069.71	1,178.42	1,160.14	1,234.58	1,137.42	1,181.67	1,159.68	1,153.63	1,183.57	977.82
18	914.25	936.07	958.29	1,109.53	1,073.05	1,158.53	1,086.25	1,180.38	1,133.32	1,049.74	973.29	870.32
19	626.75	703.53	675.19	854.95	844.10	882.84	857.00	924.91	911.26	773.00	725.86	639.32
20	432.50	467.87	468.33	571.74	635.41	718.68	706.50	682.68	629.74	536.05	499.50	462.64
21	386.55	421.67	415.24	495.74	565.09	695.84	695.08	636.36	517.11	463.37	464.79	397.59
22	323.75	356.60	373.05	444.42	519.59	577.63	594.67	498.77	419.47	382.42	387.71	357.91
23	281.60	315.73	330.57	434.21	433.68	493.21	569.67	490.45	404.74	354.58	369.50	337.14

City of Toronto - Traffic Data Centre & Safety Bureau

Permanent Counting Station Summary Report

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Station Code:

Date Range: 2005/01/01 -2005/12/31

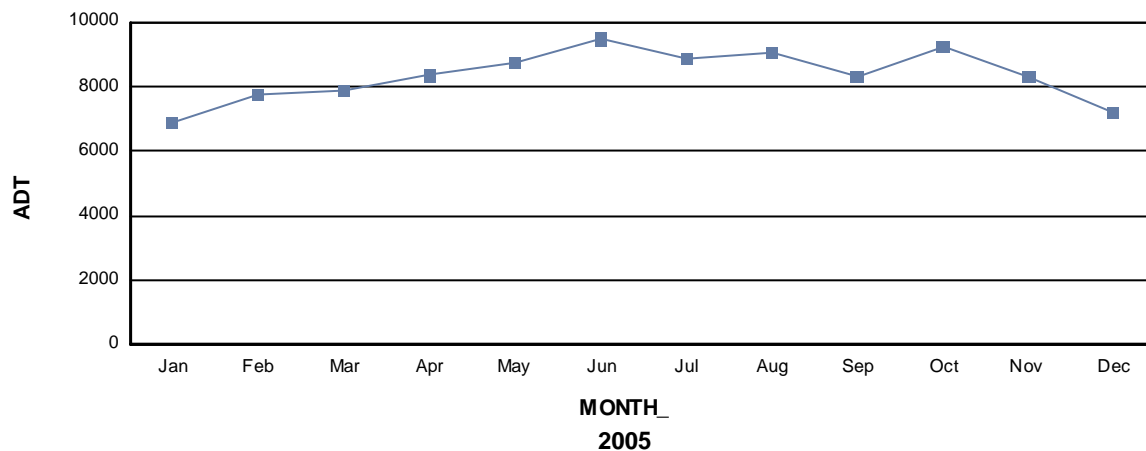
AADT: 8321.34

COUNT: 313

Variation of AADT by Month

MONTH	# COUNT	AVERAGE	VAR
January	28	6,859	82.43%
February	21	7,745	93.07%
March	27	7,869	94.57%
April	28	8,334	100.15%
May	30	8,739	105.01%
June	27	9,448	113.54%
July	20	8,876	106.67%
August	30	9,036	108.59%
September	25	8,318	99.95%
October	28	9,237	111.00%
November	18	8,281	99.51%
December	31	7,180	86.28%

Monthly Variation of AADT



Variation of AADT by Season

SEASON	SADT	%VAR
SPRING	8,831	106.12%
SUMMER	8,972	107.82%
FALL	8,671	104.20%
WINTER	7,247	87.09%

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AADT: 8321.34

COUNT: 313

Variation of Traffic Flow by Day and Month

MONTH	WEEKDAY	AVERAGE	% AADT	MONTH	WEEKDAY	AVERAGE	% AADT
Jan	SUNDAY	4,483	53.87%	Jul	SUNDAY	7,913	95.10%
Jan	MONDAY	7,200	86.52%	Jul	MONDAY	9,132	109.74%
Jan	TUESDAY	7,659	92.04%	Jul	TUESDAY	9,689	116.44%
Jan	WEDNESDAY	7,732	92.91%	Jul	WEDNESDAY	8,800	105.75%
Jan	THURSDAY	7,840	94.22%	Jul	THURSDAY	10,350	124.38%
Jan	FRIDAY	8,506	102.22%	Jul	FRIDAY	9,622	115.62%
Jan	SATURDAY	4,754	57.13%	Jul	SATURDAY	7,697	92.50%
Feb	SUNDAY	5,561	66.82%	Aug	SUNDAY	8,233	98.93%
Feb	MONDAY	7,472	89.79%	Aug	MONDAY	8,911	107.09%
Feb	TUESDAY	8,244	99.07%	Aug	TUESDAY	9,480	113.93%
Feb	WEDNESDAY	8,426	101.26%	Aug	WEDNESDAY	8,408	101.04%
Feb	THURSDAY	8,391	100.84%	Aug	THURSDAY	9,555	114.82%
Feb	FRIDAY	9,164	110.13%	Aug	FRIDAY	10,000	120.17%
Feb	SATURDAY	6,639	79.78%	Aug	SATURDAY	8,586	103.18%
Mar	SUNDAY	6,371	76.56%	Sep	SUNDAY	6,904	82.96%
Mar	MONDAY	7,795	93.68%	Sep	MONDAY	6,499	78.10%
Mar	TUESDAY	8,020	96.38%	Sep	TUESDAY	8,622	103.62%
Mar	WEDNESDAY	8,434	101.35%	Sep	WEDNESDAY	8,442	101.45%
Mar	THURSDAY	8,837	106.19%	Sep	THURSDAY	9,347	112.33%
Mar	FRIDAY	8,119	97.57%	Sep	FRIDAY	9,663	116.13%
Mar	SATURDAY	6,627	79.64%	Sep	SATURDAY	7,463	89.69%
Apr	SUNDAY	5,920	71.15%	Oct	SUNDAY	9,622	115.63%
Apr	MONDAY	8,630	103.71%	Oct	MONDAY	7,851	94.35%
Apr	TUESDAY	8,962	107.70%	Oct	TUESDAY	8,495	102.09%
Apr	WEDNESDAY	8,979	107.90%	Oct	WEDNESDAY	9,183	110.35%
Apr	THURSDAY	9,452	113.59%	Oct	THURSDAY	7,776	93.44%
Apr	FRIDAY	9,668	116.18%	Oct	FRIDAY	9,807	117.85%
Apr	SATURDAY	6,964	83.69%	Oct	SATURDAY	11,505	138.26%
May	SUNDAY	7,100	85.32%	Nov	SUNDAY	5,683	68.29%
May	MONDAY	8,172	98.21%	Nov	MONDAY	8,248	99.12%
May	TUESDAY	8,833	106.15%	Nov	TUESDAY	8,650	103.95%
May	WEDNESDAY	9,668	116.18%	Nov	WEDNESDAY	9,089	109.23%
May	THURSDAY	9,660	116.08%	Nov	THURSDAY	8,488	102.00%
May	FRIDAY	9,973	119.85%	Nov	FRIDAY	9,421	113.21%
May	SATURDAY	8,142	97.84%	Nov	SATURDAY	7,125	85.62%
Jun	SUNDAY	9,454	113.61%	Dec	SUNDAY	4,989	59.95%
Jun	MONDAY	9,332	112.15%	Dec	MONDAY	7,206	86.60%
Jun	TUESDAY	9,682	116.36%	Dec	TUESDAY	7,568	90.94%
Jun	WEDNESDAY	10,081	121.15%	Dec	WEDNESDAY	7,910	95.05%
Jun	THURSDAY	10,415	125.16%	Dec	THURSDAY	8,366	100.54%
Jun	FRIDAY	9,711	116.69%	Dec	FRIDAY	8,084	97.15%
Jun	SATURDAY	7,438	89.38%	Dec	SATURDAY	5,928	71.24%

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Hourly Avg Volume of Traffic by Month - Weekday

Beginning Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	71.10	71.53	74.85	77.26	100.36	106.68	131.36	120.64	89.17	90.78	82.21	79.09
1	61.15	66.27	65.40	73.32	73.59	87.06	105.27	98.00	78.44	64.78	68.43	77.45
2	37.90	41.60	46.19	44.21	54.05	55.42	67.45	63.48	55.94	40.17	45.43	52.73
3	30.85	37.47	39.24	30.79	38.77	39.58	51.73	52.86	40.72	35.89	33.43	38.82
4	28.55	33.27	36.14	29.00	39.14	41.79	48.09	52.57	40.56	34.83	34.43	37.55
5	85.90	94.47	88.43	102.79	111.55	112.63	109.73	100.19	114.00	110.39	104.86	88.91
6	255.05	265.67	257.38	277.16	268.41	286.89	263.27	262.48	265.78	272.89	272.71	214.73
7	425.10	459.67	454.67	495.21	499.82	517.05	440.09	427.62	427.72	454.56	463.14	376.50
8	555.70	592.87	580.43	610.42	596.36	609.53	536.83	579.00	567.28	565.06	615.57	518.86
9	627.25	660.93	623.81	682.63	650.86	664.05	613.00	633.64	654.83	691.72	682.07	557.77
10	502.40	532.27	505.10	580.63	567.95	599.72	549.25	579.55	562.94	542.89	561.71	469.86
11	434.00	434.00	425.19	473.05	479.00	531.61	487.25	478.32	464.61	438.67	458.85	440.86
12	431.10	466.33	449.19	493.84	471.86	538.44	525.17	516.14	473.61	462.61	457.00	466.86
13	428.00	450.60	453.86	493.95	494.64	530.32	511.92	509.05	464.33	469.00	451.07	447.23
14	404.75	436.13	439.71	490.58	476.18	514.21	505.08	486.86	470.44	457.94	481.64	457.32
15	433.80	464.20	476.81	516.26	505.73	553.16	540.75	531.86	498.41	496.32	500.00	459.27
16	510.95	571.07	553.52	608.32	609.32	641.68	620.33	604.05	579.17	594.37	582.50	535.68
17	588.45	677.87	644.62	726.95	748.71	780.26	752.50	741.05	721.00	711.53	709.64	617.73
18	579.00	628.27	609.19	694.21	754.10	795.89	764.33	752.57	684.63	679.32	609.64	541.68
19	392.65	440.53	439.76	523.47	554.95	590.79	605.75	557.18	535.68	483.26	512.79	405.73
20	255.55	297.93	300.10	364.79	361.82	387.47	414.08	414.27	381.53	341.63	357.29	286.59
21	242.70	252.60	263.71	314.58	312.77	361.95	377.08	353.41	311.32	278.84	287.43	248.09
22	191.65	222.33	231.71	253.63	262.64	308.11	327.33	290.59	257.53	251.32	255.43	238.27
23	181.80	205.20	208.43	244.89	253.23	308.53	344.42	321.18	270.05	239.21	255.21	205.32

Graphical 24-Hour Count Summary Report

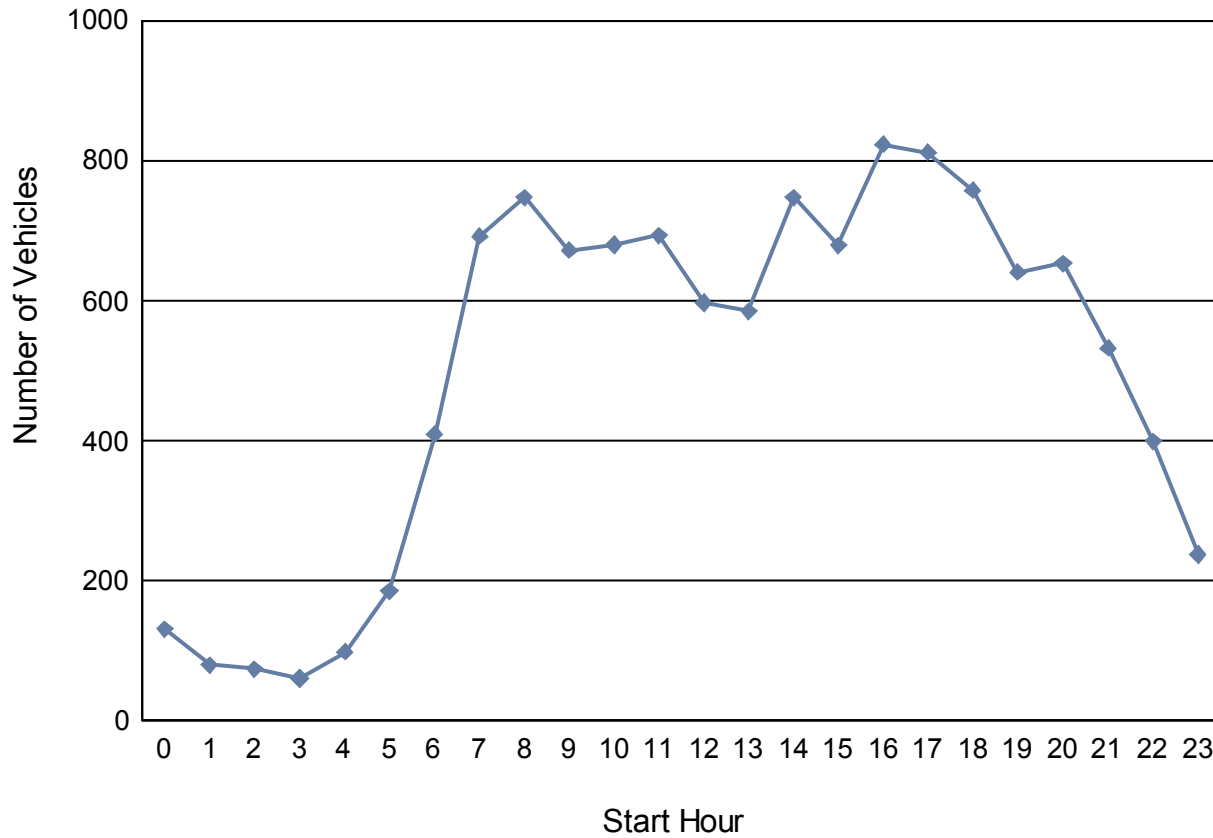
JARVIS ST S/B N OF LAKE SHORE BLVD W/B

Station Number: 3442

Southbound

Artery Code: 3442

Category: 24 HOUR



Survey Date: Tue, November 25, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
131	80	75	61	99	186	410	693	749	673	681	694	598	586	749	680	825	813	759	642	655	533	400	238

Comment:

Graphical 24-Hour Count Summary Report

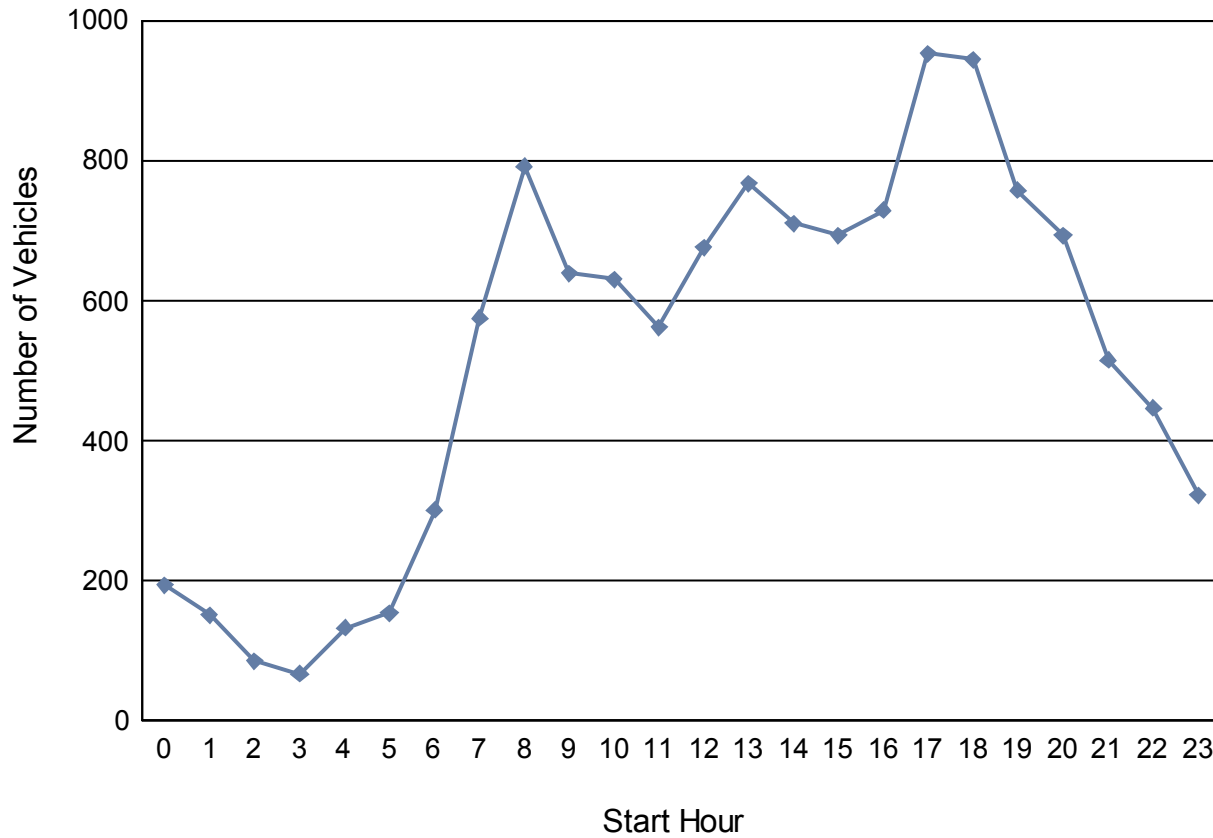
JARVIS ST S/B N OF LAKE SHORE BLVD W/B

Station Number: 3442

Southbound

Artery Code: 3442

Category: 24 HOUR



Survey Date: Wed, November 26, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
195	151	86	67	133	154	302	576	793	640	632	563	677	769	712	695	731	954	946	759	695	516	447	323

Comment:

Graphical 24-Hour Count Summary Report

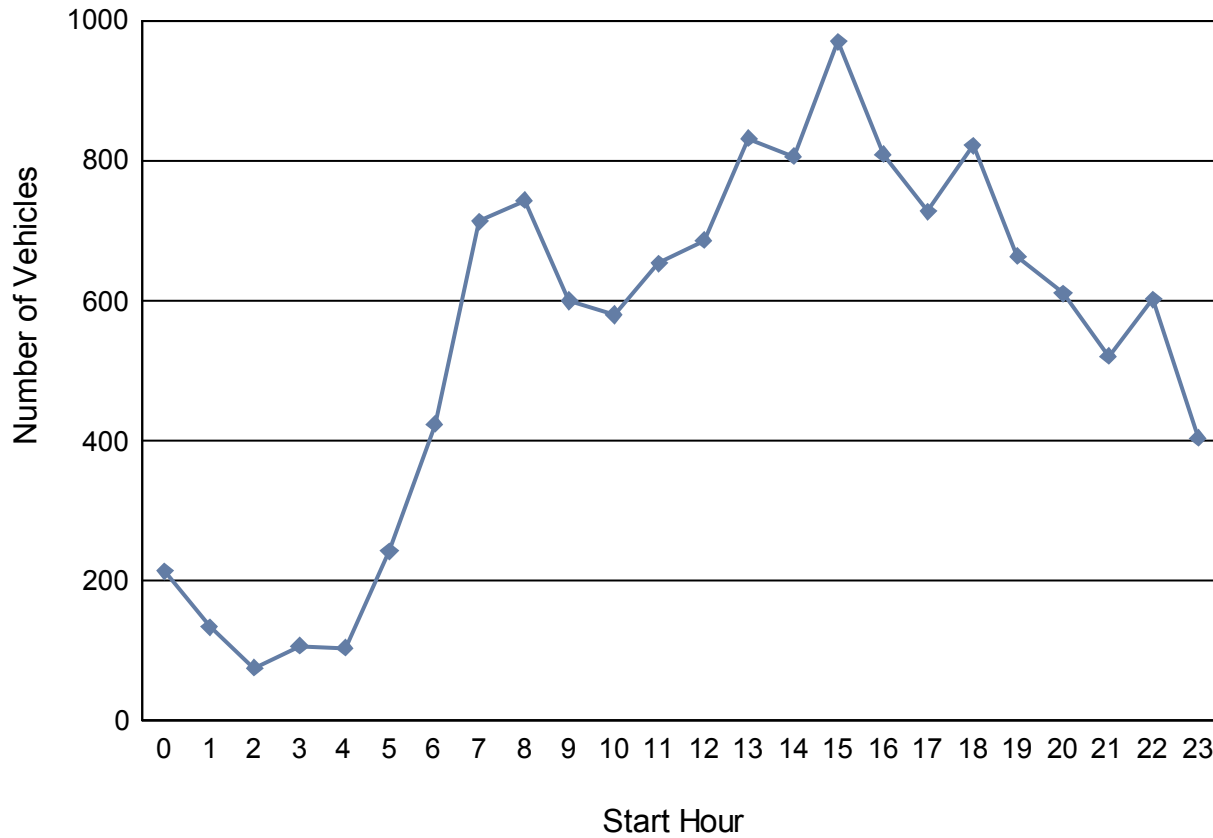
JARVIS ST S/B N OF LAKE SHORE BLVD W/B

Station Number: 3442

Southbound

Artery Code: 3442

Category: 24 HOUR



Survey Date: Thu, November 27, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
214	135	76	107	105	243	424	715	745	601	581	654	688	833	808	972	811	729	823	665	611	522	603	405

Comment:

Graphical 24-Hour Count Summary Report

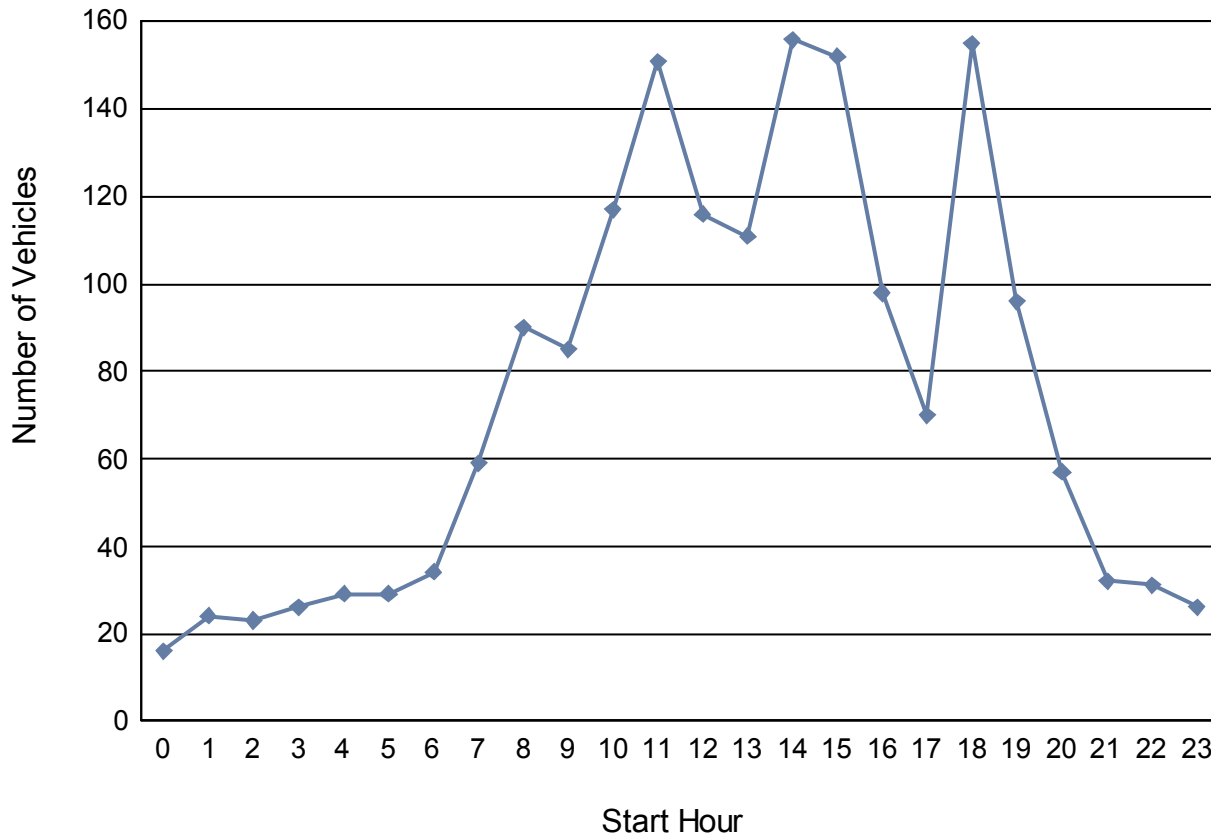
JARVIS ST S/B N OF QUEEN'S QUAY

Station Number: 622

Southbound

Artery Code: 622

Category: 24 HOUR



Survey Date: Tue, November 25, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
16	24	23	26	29	29	34	59	90	85	117	151	116	111	156	152	98	70	155	96	57	32	31	26

Comment:

Graphical 24-Hour Count Summary Report

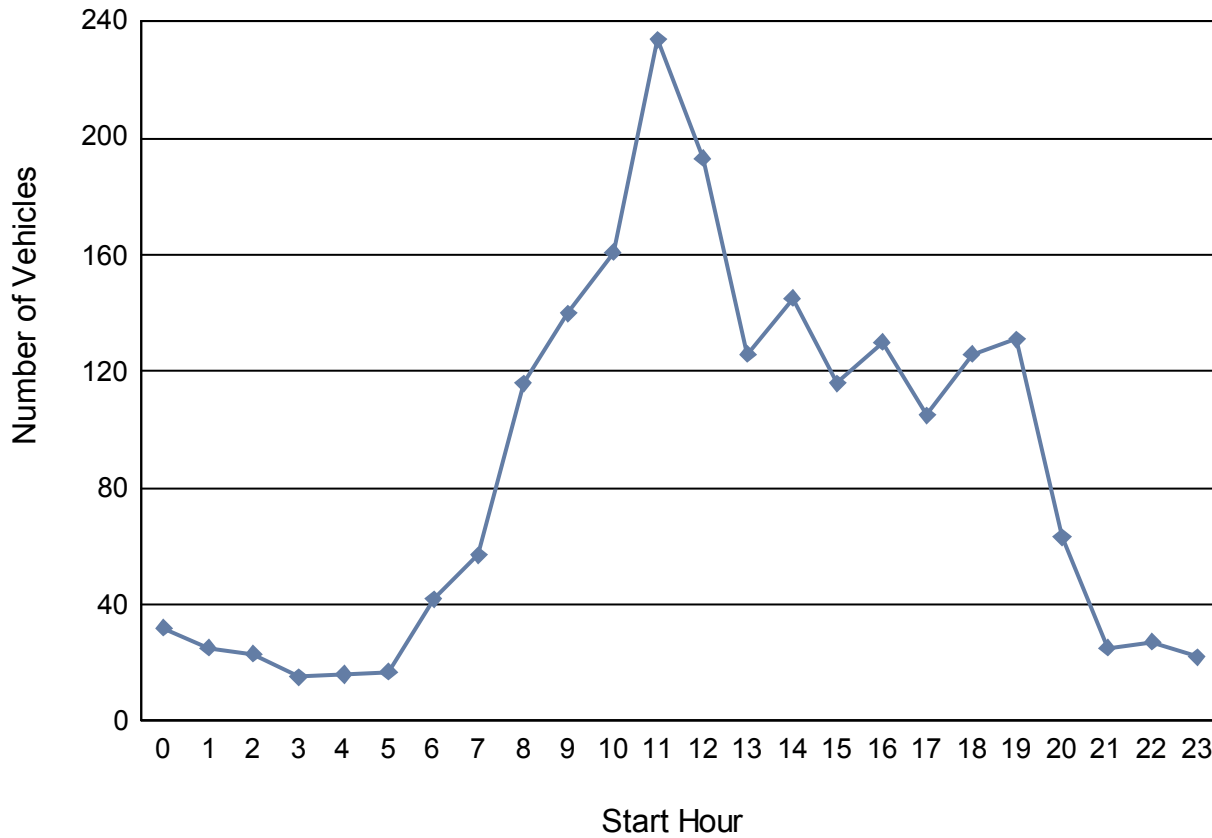
JARVIS ST S/B N OF QUEEN'S QUAY

Station Number: 622

Southbound

Artery Code: 622

Category: 24 HOUR



Survey Date: Wed, November 26, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
32	25	23	15	16	17	42	57	116	140	161	234	193	126	145	116	130	105	126	131	63	25	27	22

Comment:

Graphical 24-Hour Count Summary Report

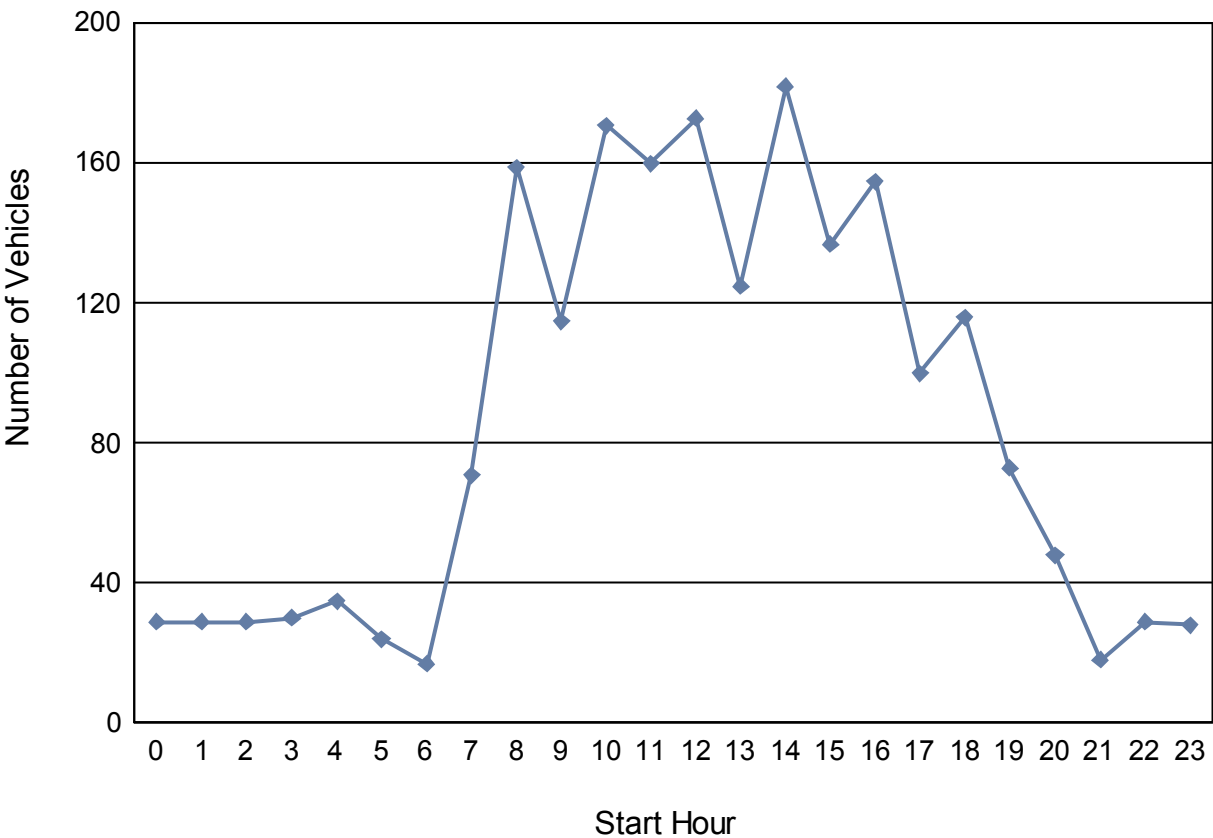
JARVIS ST S/B N OF QUEEN'S QUAY

Station Number: 622

Southbound

Artery Code: 622

Category: 24 HOUR



Survey Date: Thu, November 27, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
29	29	29	30	35	24	17	71	159	115	171	160	173	125	182	137	155	100	116	73	48	18	29	28

Comment:

Graphical 24-Hour Count Summary Report

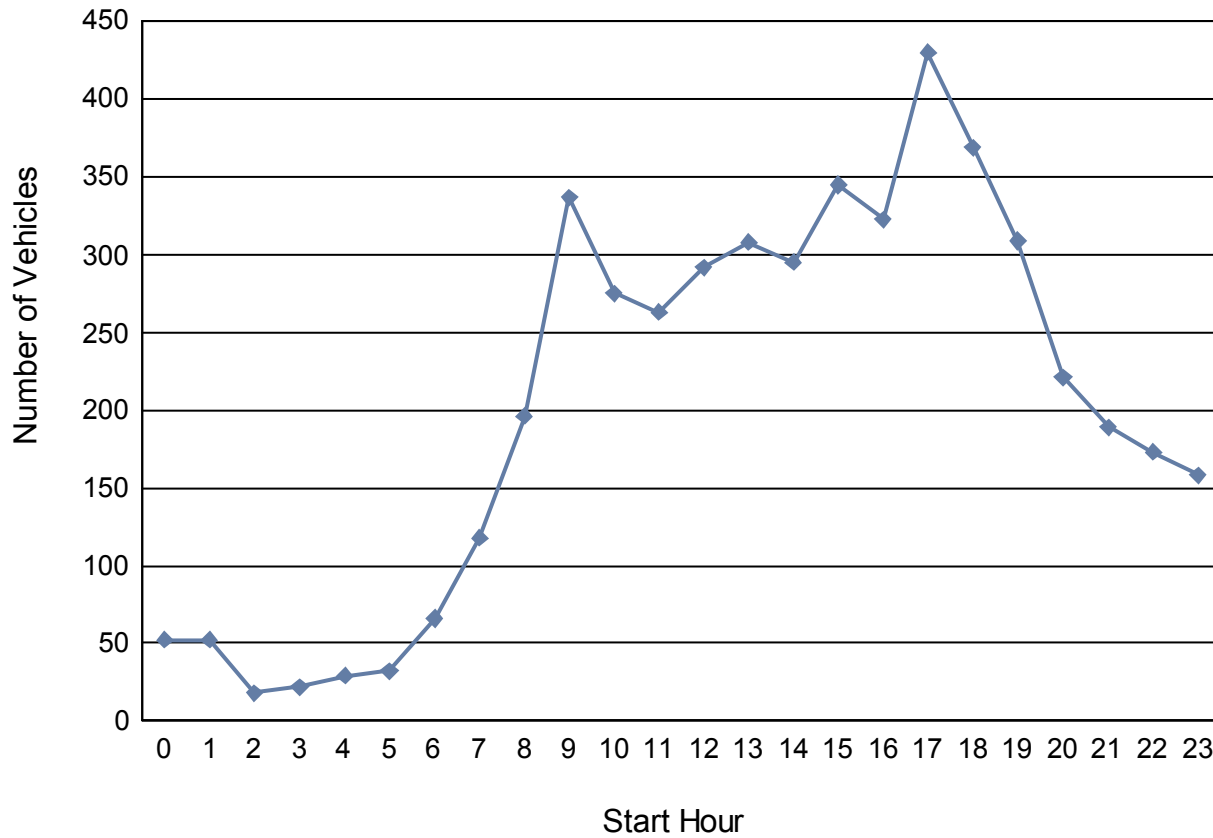
JARVIS ST N/B S OF LAKE SHORE BLVD E/B

Station Number: 3441

Northbound

Artery Code: 3441

Category: 24 HOUR



Survey Date: Tue, November 25, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
52	52	18	22	29	32	66	118	196	337	275	263	292	308	295	345	323	430	369	309	221	189	173	158

Comment:

Graphical 24-Hour Count Summary Report

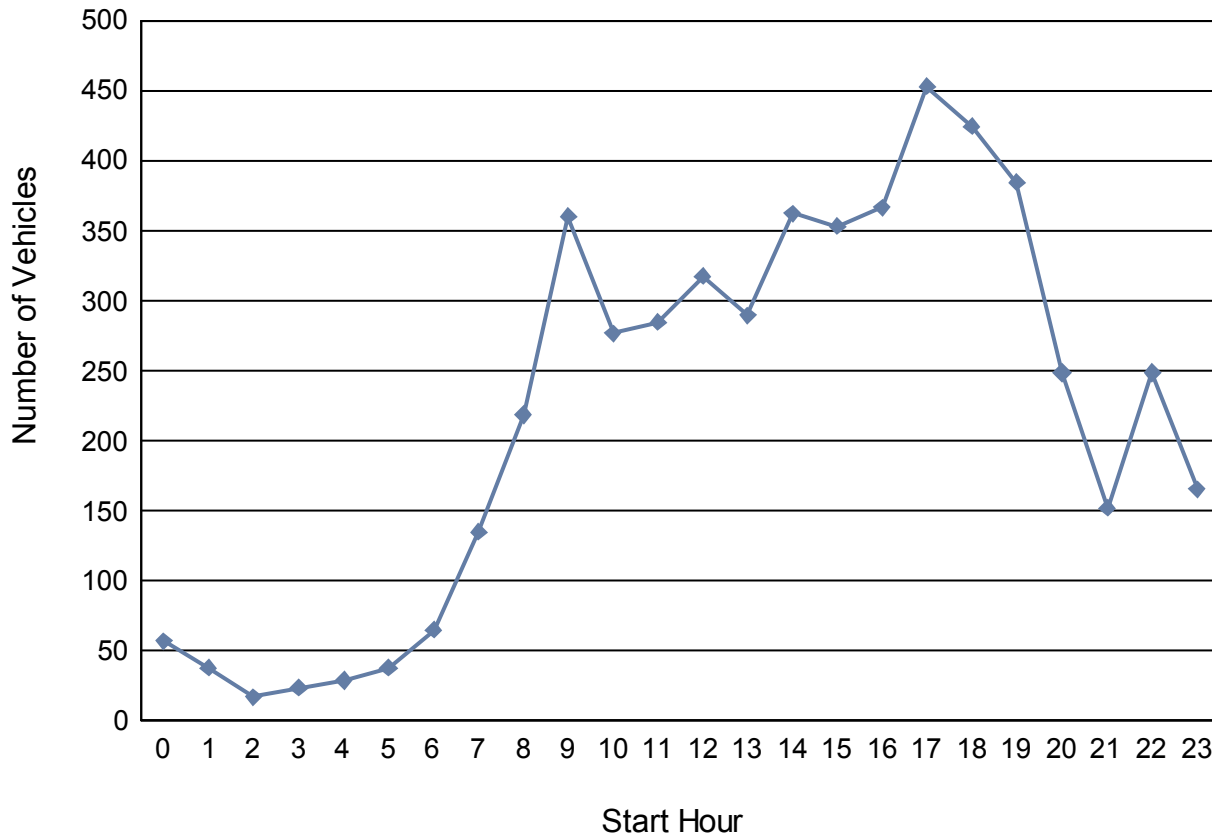
JARVIS ST N/B S OF LAKE SHORE BLVD E/B

Station Number: 3441

Northbound

Artery Code: 3441

Category: 24 HOUR



Survey Date: Wed, November 26, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
57	38	17	24	29	38	65	135	219	361	277	285	318	290	363	354	367	454	425	385	249	152	249	166

Comment:

Graphical 24-Hour Count Summary Report

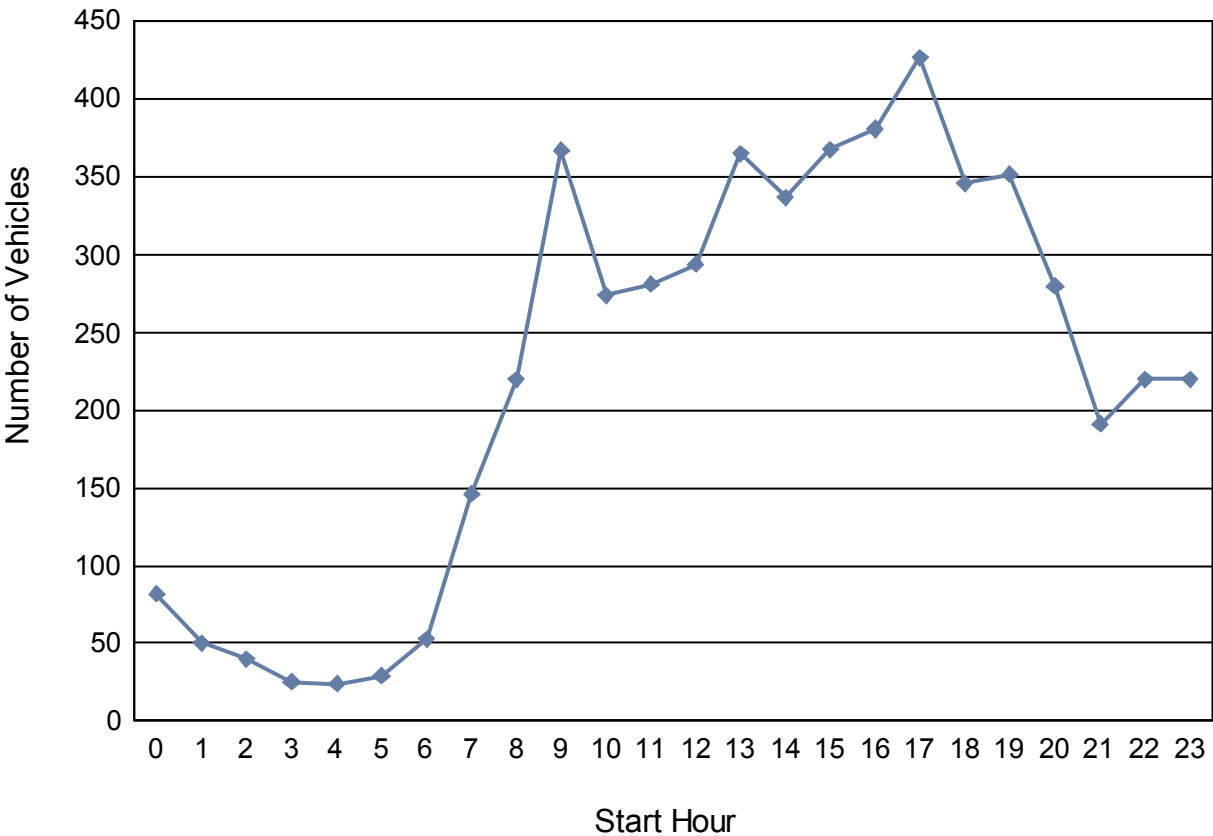
JARVIS ST N/B S OF LAKE SHORE BLVD E/B

Station Number: 3441

Northbound

Artery Code: 3441

Category: 24 HOUR



Survey Date: Thu, November 27, 2003

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
82	50	40	25	24	29	53	146	220	367	274	281	294	365	337	368	381	427	346	352	280	191	220	220

Comment:

Graphical 24-Hour Count Summary Report

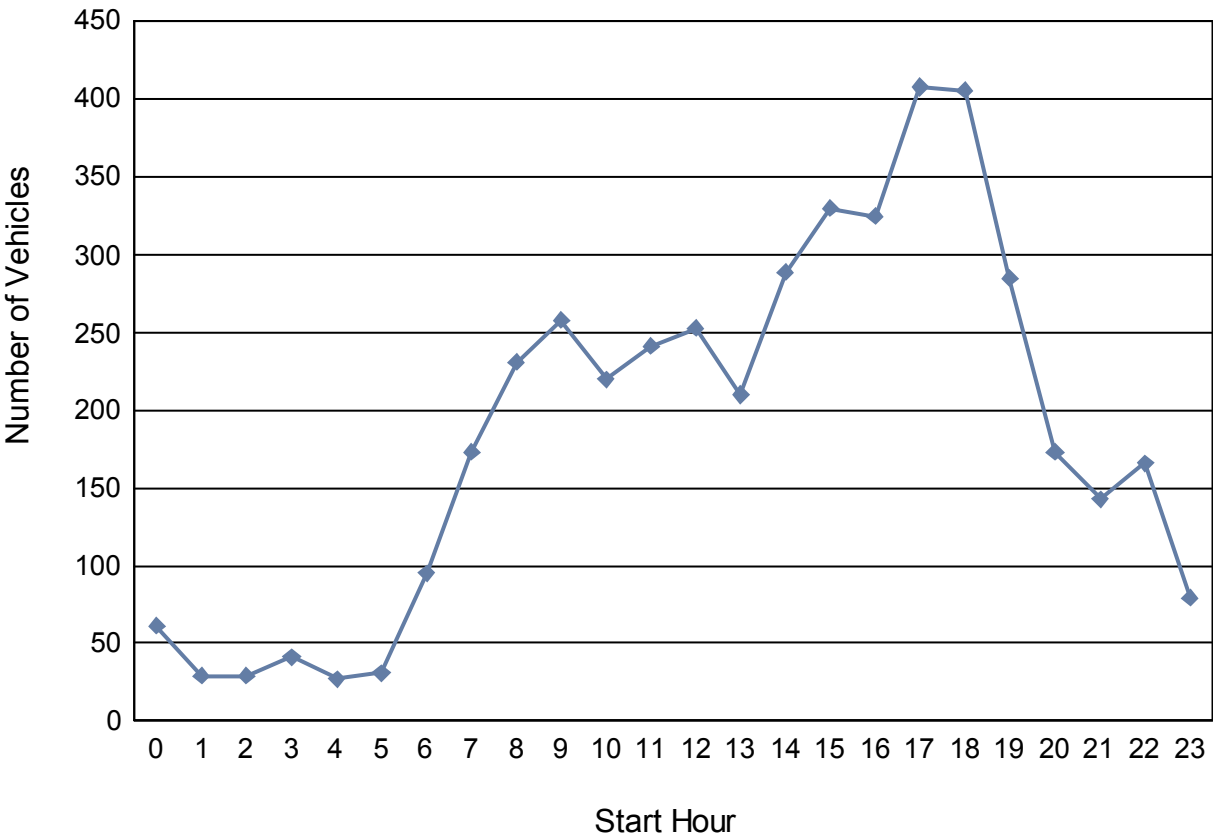
LOWER SHERBOURNE ST S/B N OF LAKE SHORE BLVD

Station Number: 23457

Southbound

Artery Code: 23457

Category: 24 HOUR



Survey Date: Tue, February 24, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
61	29	29	41	27	31	95	173	231	258	220	241	253	210	289	330	325	408	406	285	173	143	166	79

Comment:

Graphical 24-Hour Count Summary Report

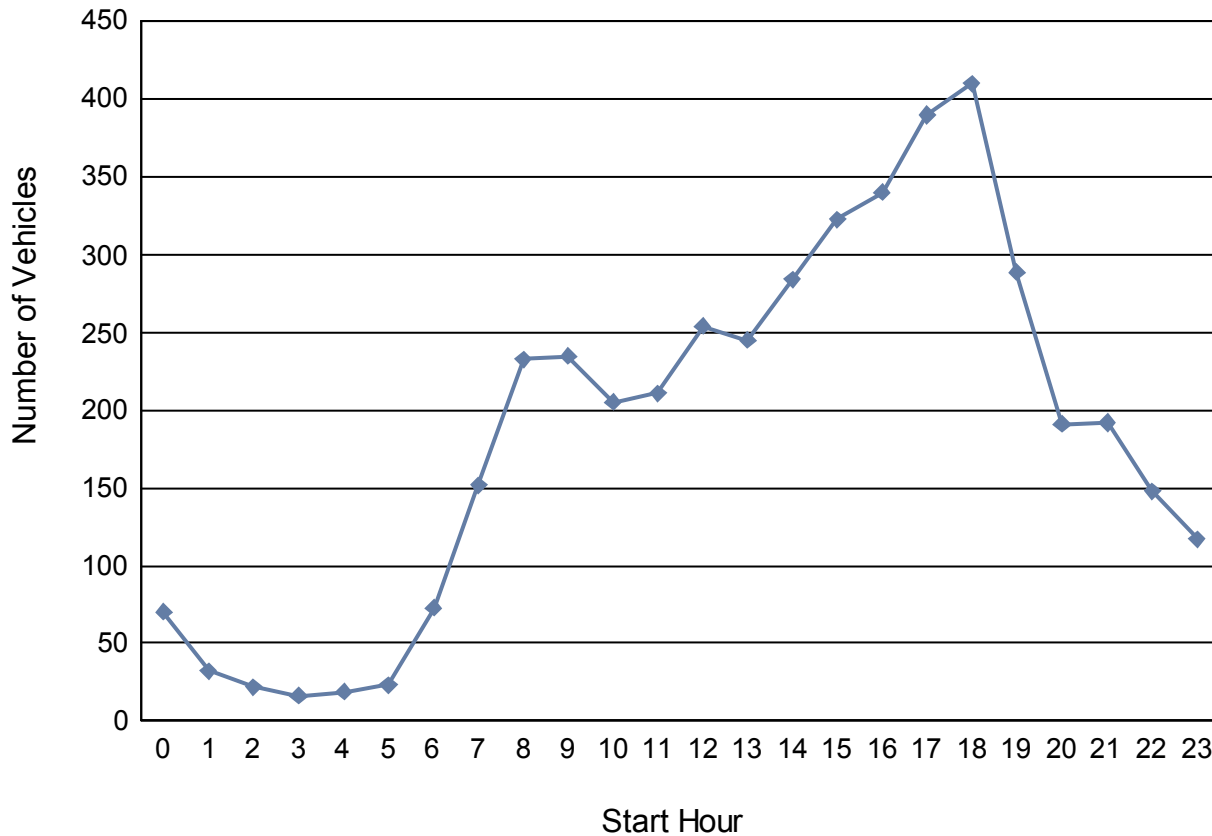
LOWER SHERBOURNE ST S/B N OF LAKE SHORE BLVD

Station Number: 23457

Southbound

Artery Code: 23457

Category: 24 HOUR



Survey Date: Wed, February 25, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
70	32	22	16	19	23	73	152	233	235	205	211	254	245	284	323	340	390	410	289	191	192	148	117

Comment:

Graphical 24-Hour Count Summary Report

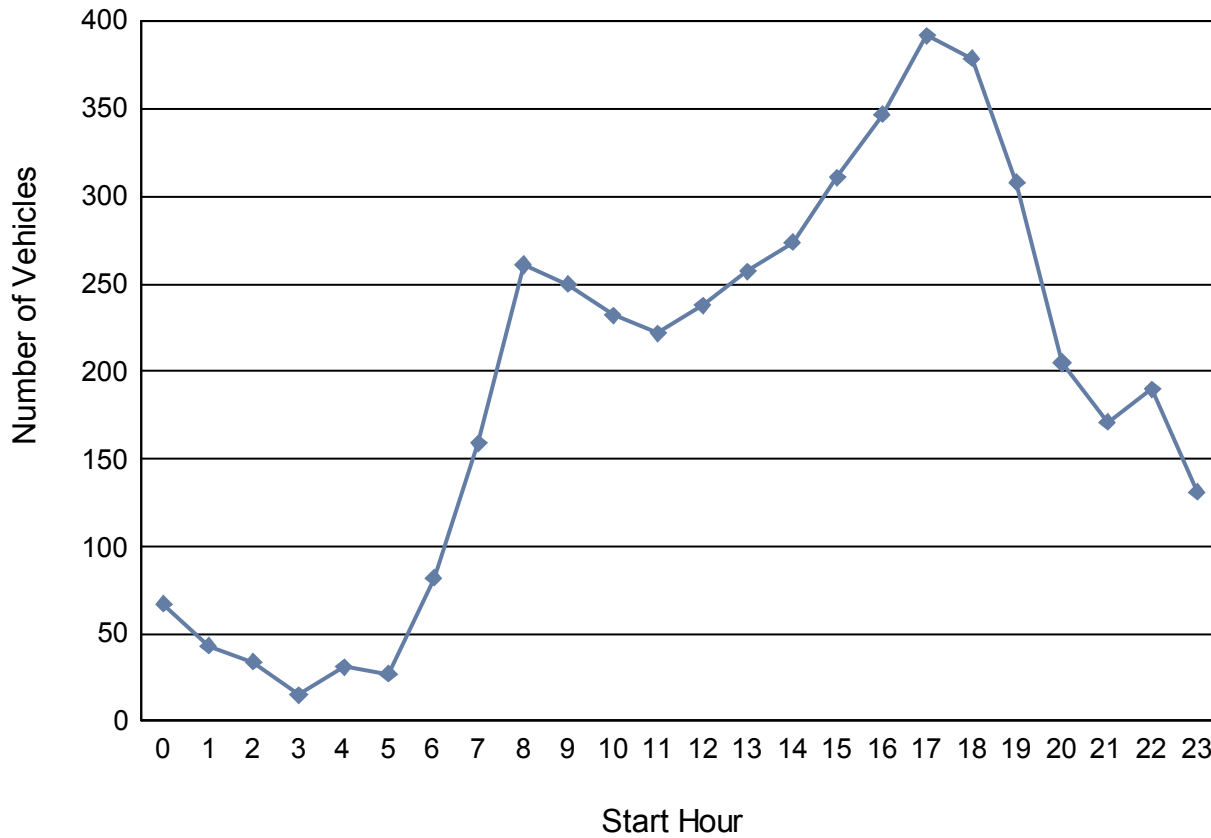
LOWER SHERBOURNE ST S/B N OF LAKE SHORE BLVD

Station Number: 23457

Southbound

Artery Code: 23457

Category: 24 HOUR



Survey Date: Thu, February 26, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
67	43	34	15	31	27	82	159	261	250	232	222	238	257	274	311	347	392	379	308	205	171	190	131

Comment:

Graphical 24-Hour Count Summary Report

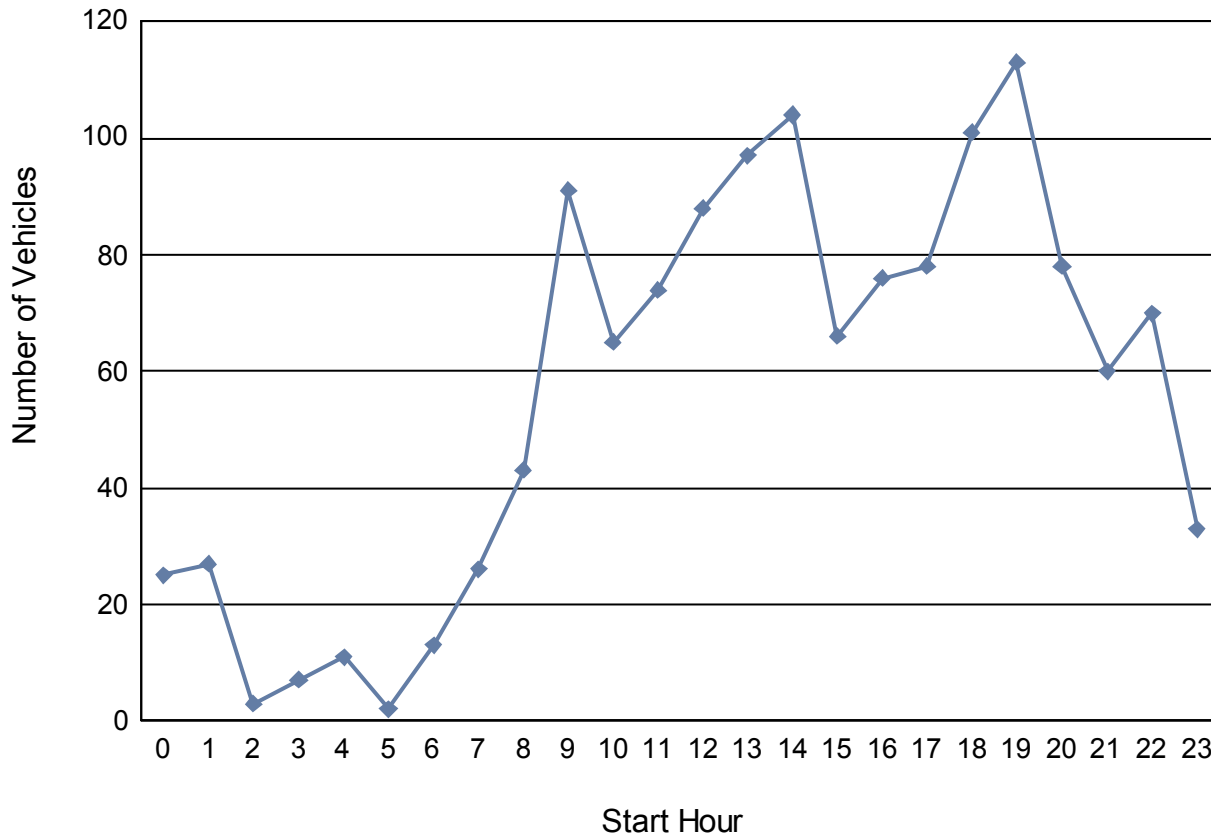
LOWER SHERBOURNE ST N/B S OF LAKE SHORE BLVD

Station Number: 23456

Northbound

Artery Code: 23456

Category: 24 HOUR



Survey Date: Tue, February 24, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
25	27	3	7	11	2	13	26	43	91	65	74	88	97	104	66	76	78	101	113	78	60	70	33

Comment:

Graphical 24-Hour Count Summary Report

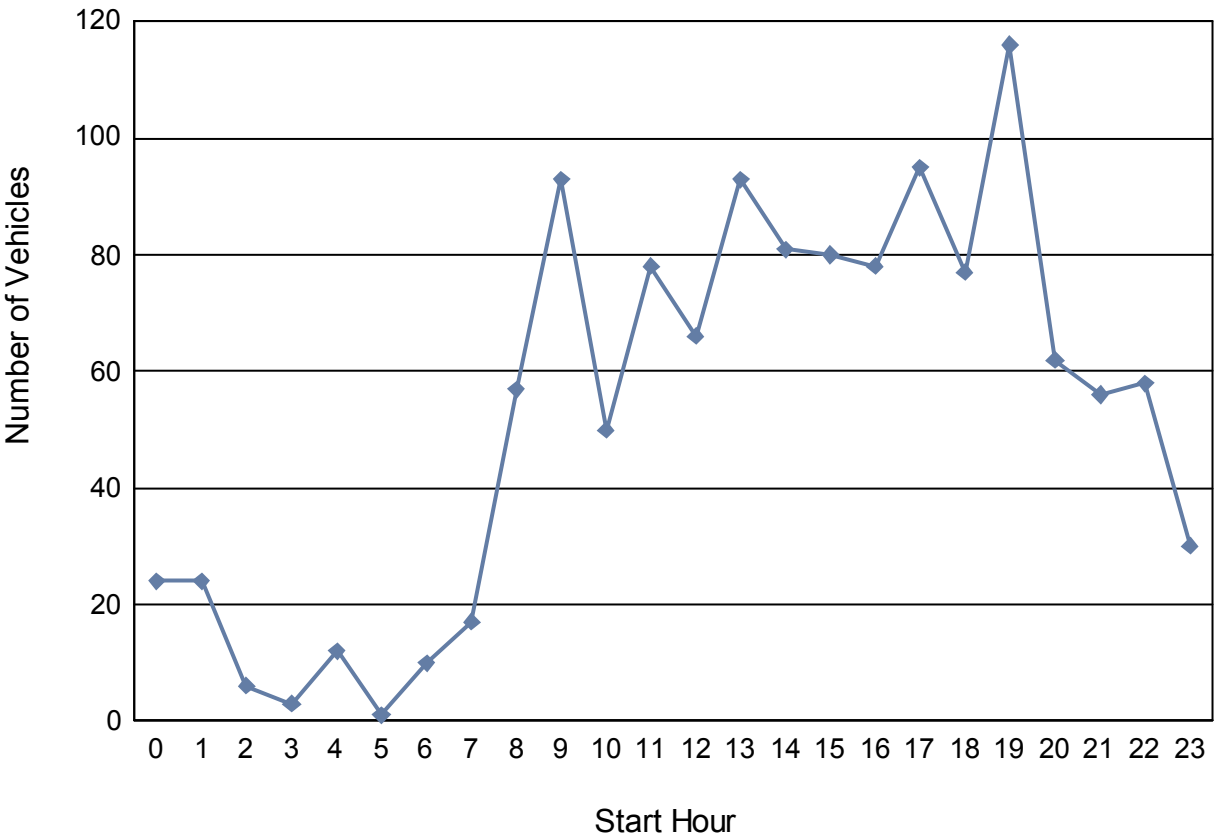
LOWER SHERBOURNE ST N/B S OF LAKE SHORE BLVD

Station Number: 23456

Northbound

Artery Code: 23456

Category: 24 HOUR



Survey Date: Wed, February 25, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
24	24	6	3	12	1	10	17	57	93	50	78	66	93	81	80	78	95	77	116	62	56	58	30

Comment:

Graphical 24-Hour Count Summary Report

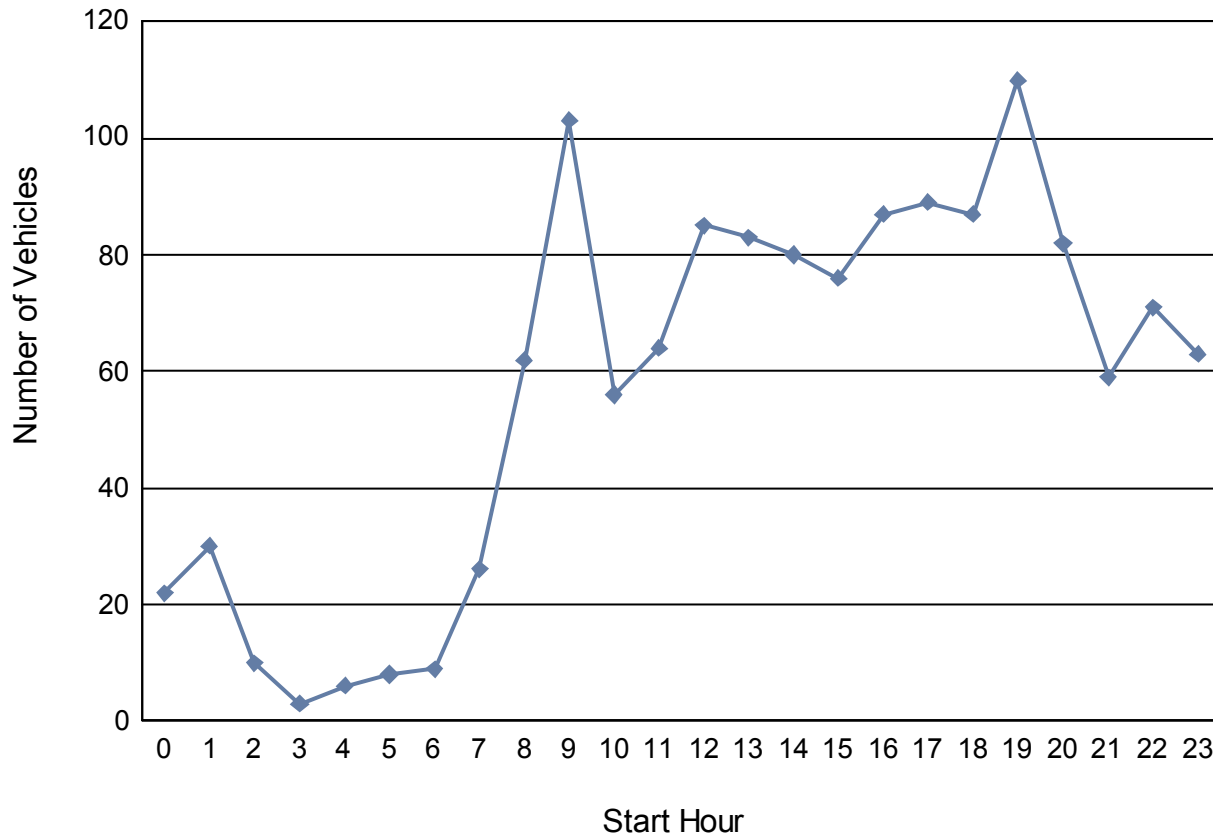
LOWER SHERBOURNE ST N/B S OF LAKE SHORE BLVD

Station Number: 23456

Northbound

Artery Code: 23456

Category: 24 HOUR



Survey Date: Thu, February 26, 2004

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
22	30	10	3	6	8	9	26	62	103	56	64	85	83	80	76	87	89	87	110	82	59	71	63

Comment:

Graphical 24-Hour Count Summary Report

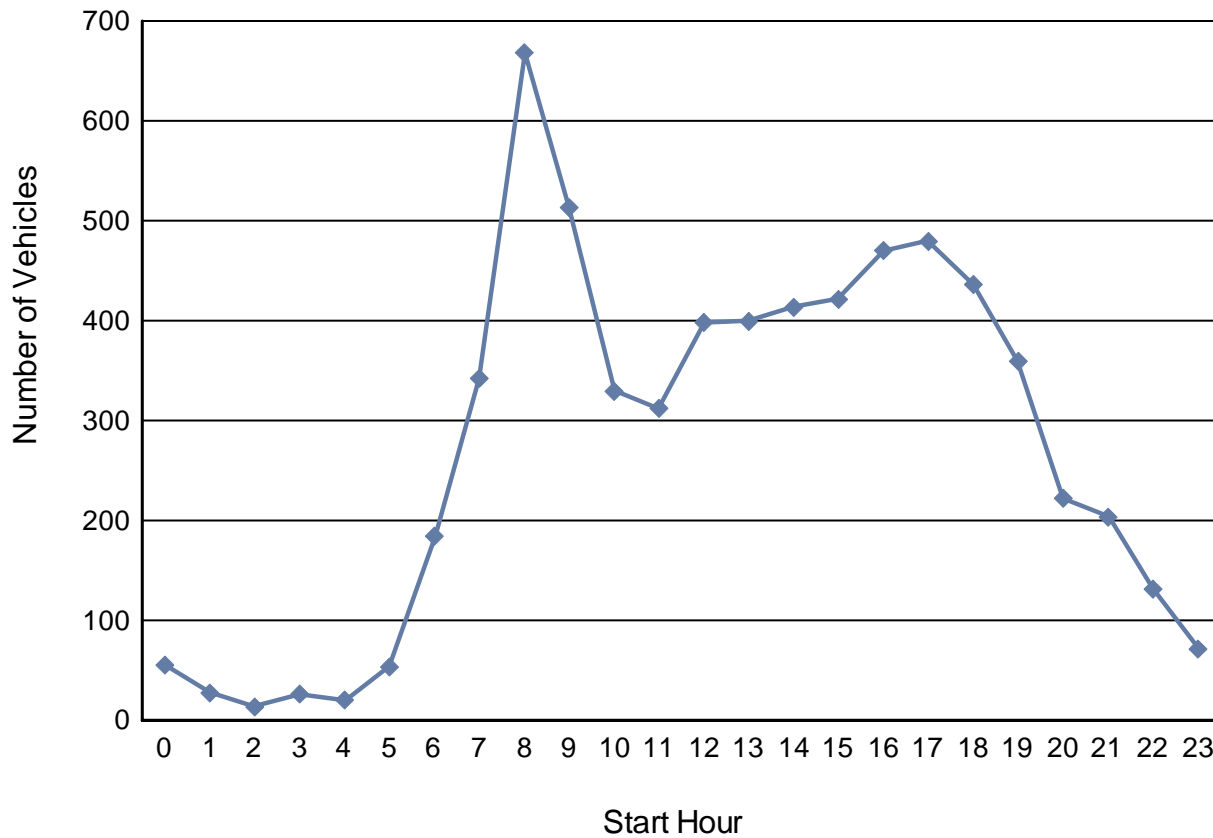
QUEENS QUAY W/B E OF JARVIS ST

Station Number: 14917

Westbound

Artery Code: 14917

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
56	28	14	27	21	54	185	343	669	514	330	313	399	400	414	422	471	480	437	360	223	204	132	72

Comment:

Graphical 24-Hour Count Summary Report

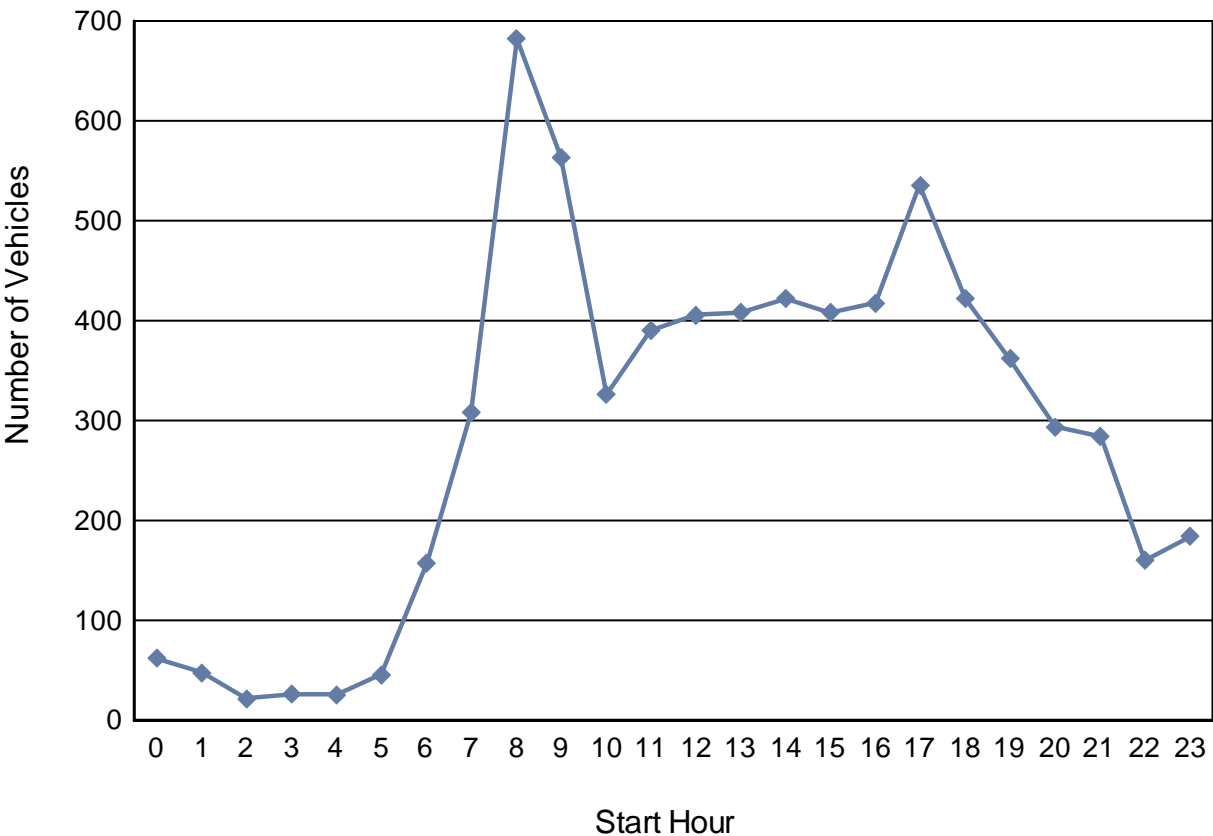
QUEENS QUAY W/B E OF JARVIS ST

Westbound

Station Number: 14917

Artery Code: 14917

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
63	48	22	27	26	46	158	309	683	564	327	391	406	409	423	409	418	536	423	363	294	285	161	185

Comment:

Graphical 24-Hour Count Summary Report

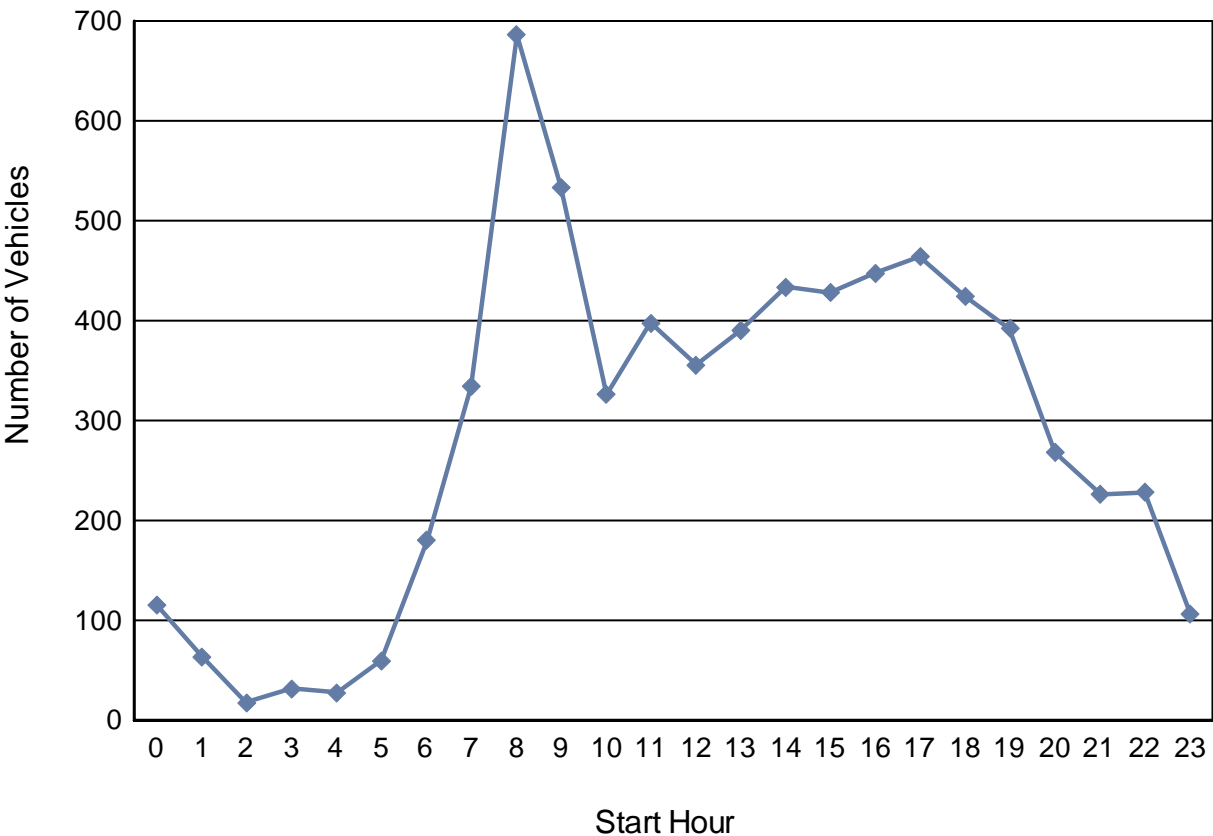
QUEENS QUAY W/B E OF JARVIS ST

Westbound

Station Number: 14917

Artery Code: 14917

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
116	64	18	32	28	60	181	335	687	534	327	398	356	391	434	429	448	465	425	393	269	227	229	107

Comment:

Graphical 24-Hour Count Summary Report

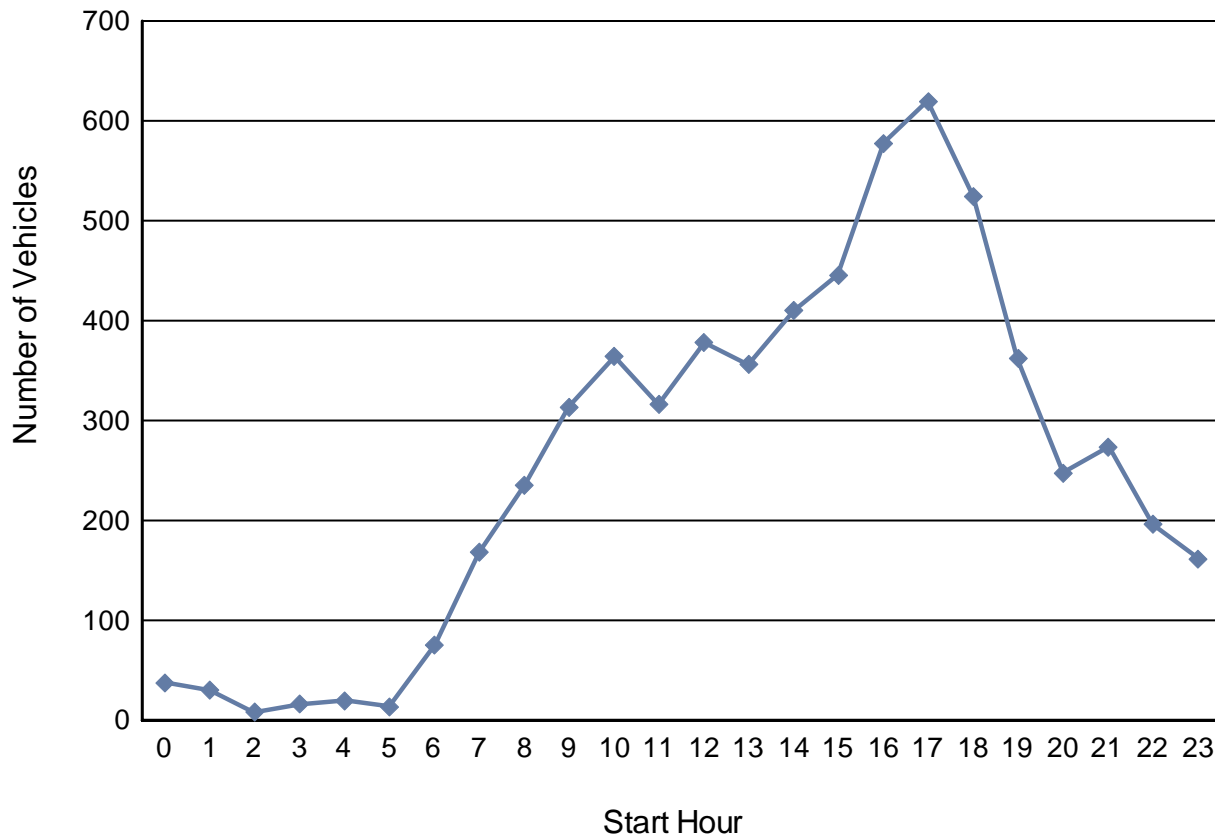
QUEENS QUAY E/B W OF LOWER JARVIS ST

Station Number: 23240

Eastbound

Artery Code: 23240

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
38	31	9	17	20	14	76	169	236	314	365	317	379	357	411	446	578	620	525	363	248	274	197	162

Comment:

Graphical 24-Hour Count Summary Report

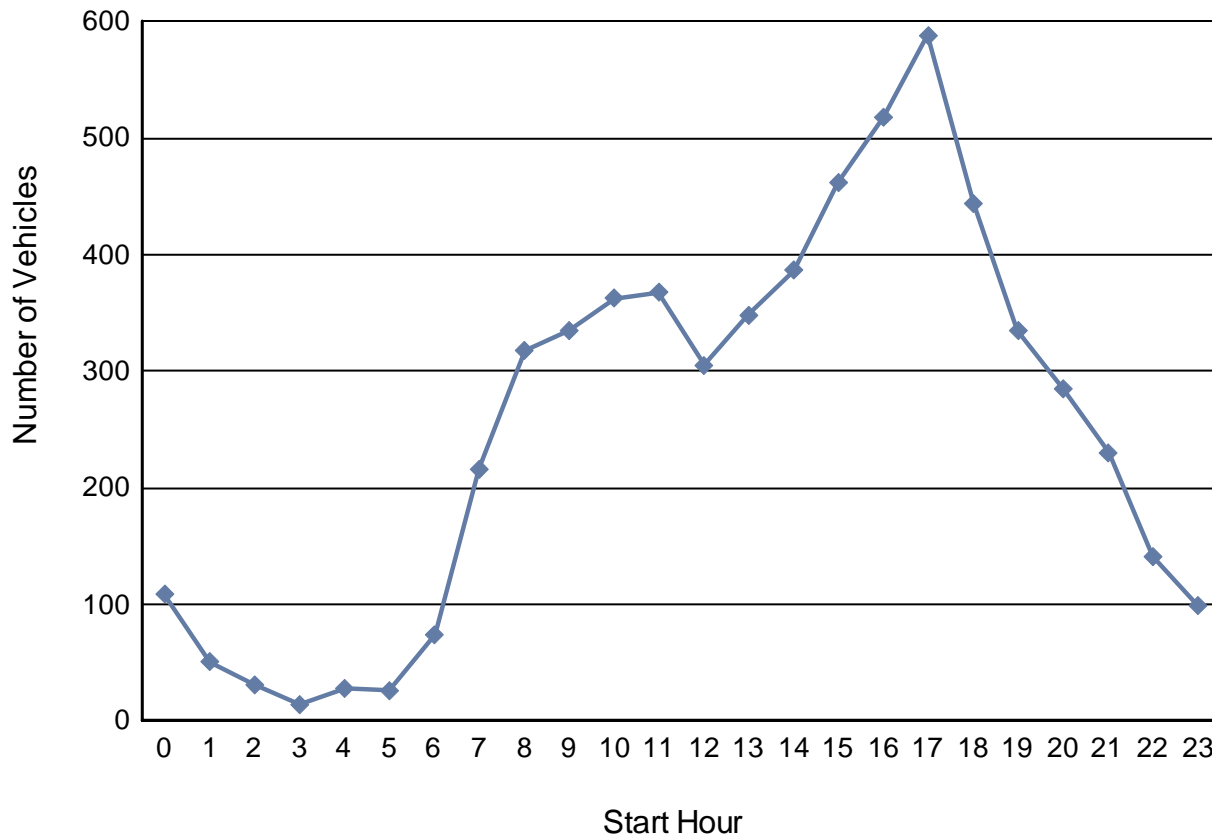
QUEENS QUAY E/B W OF LOWER JARVIS ST

Station Number: 23240

Eastbound

Artery Code: 23240

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
109	51	31	14	28	26	74	216	318	335	363	368	305	348	387	462	518	588	444	335	285	230	141	99

Comment:

Graphical 24-Hour Count Summary Report

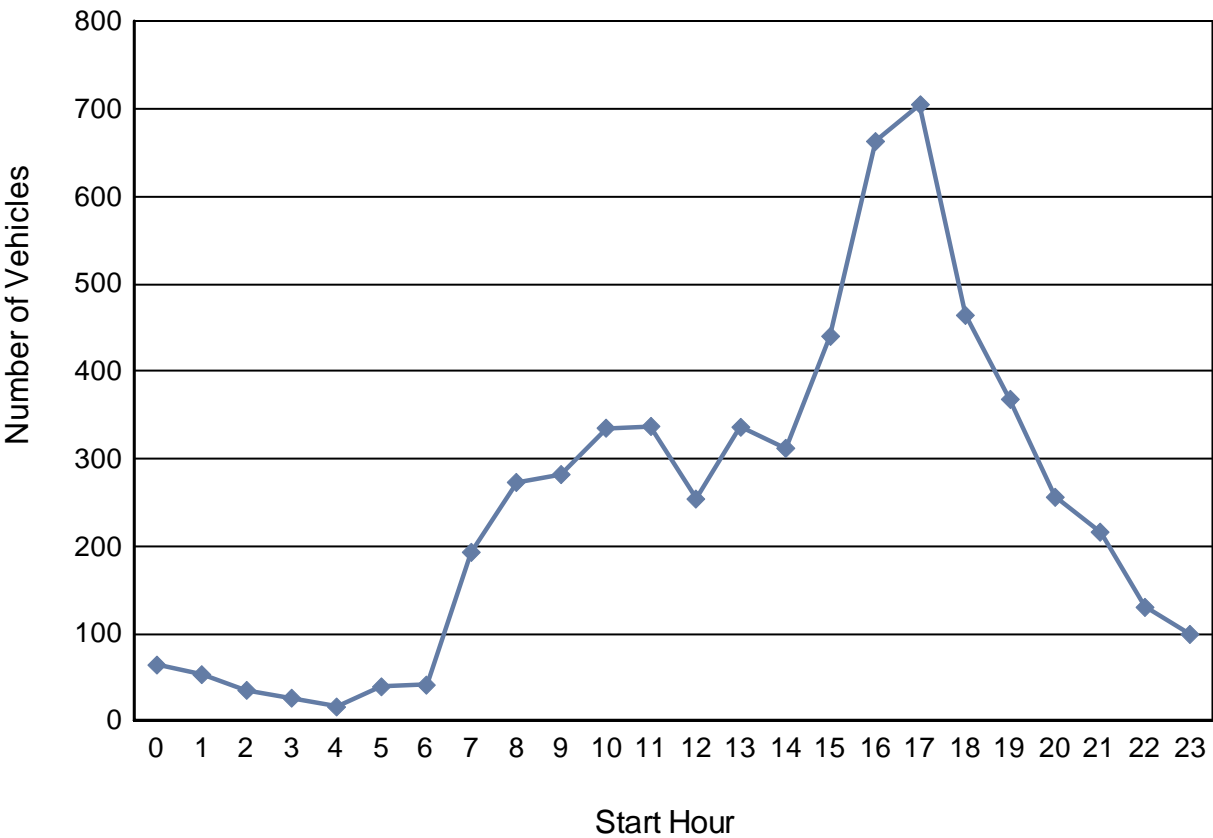
QUEENS QUAY E/B W OF LOWER JARVIS ST

Station Number: 23240

Eastbound

Artery Code: 23240

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
64	53	35	26	16	39	41	193	273	282	335	337	254	336	312	440	663	705	464	368	256	216	130	99

Comment:

Graphical 24-Hour Count Summary Report

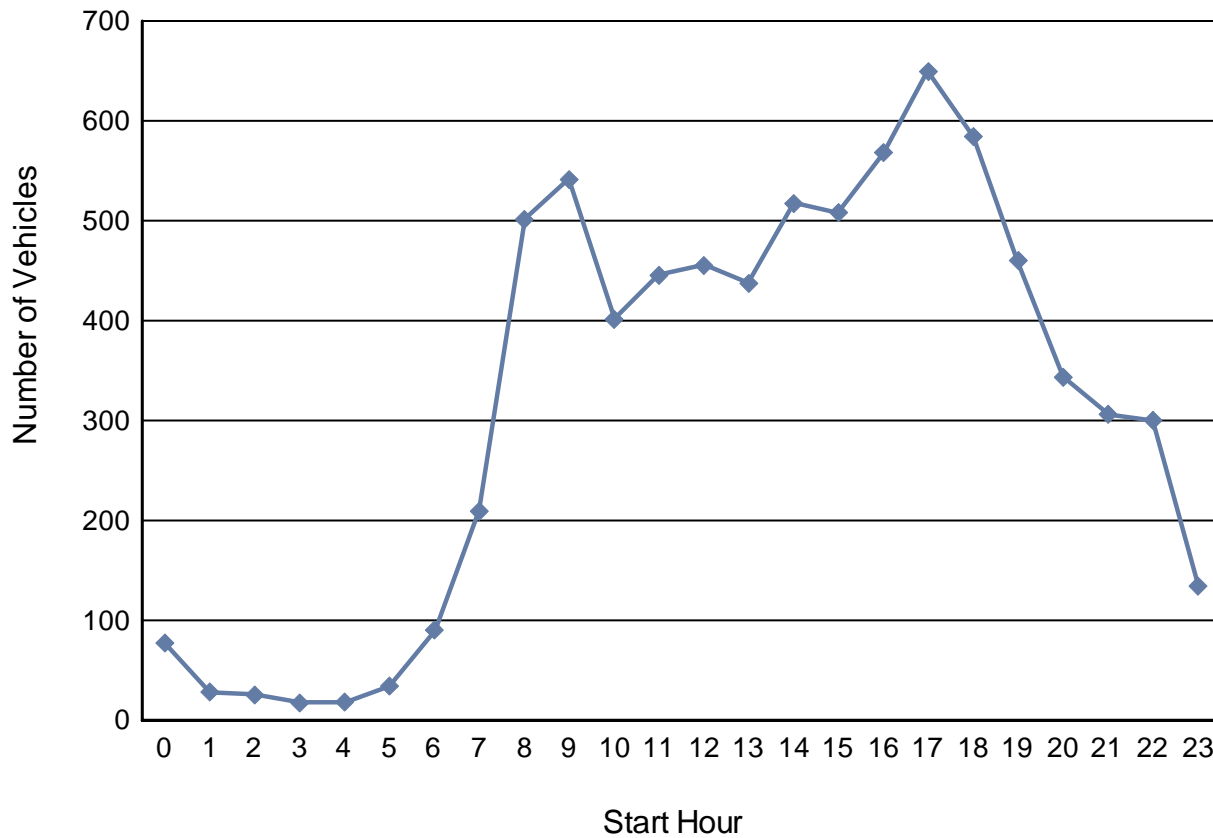
QUEENS QUAY W/B E OF YONGE ST

Station Number: 14919

Westbound

Artery Code: 14919

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
78	29	26	18	19	35	91	210	502	542	402	446	456	438	518	509	569	650	585	461	344	307	301	135

Comment:

Graphical 24-Hour Count Summary Report

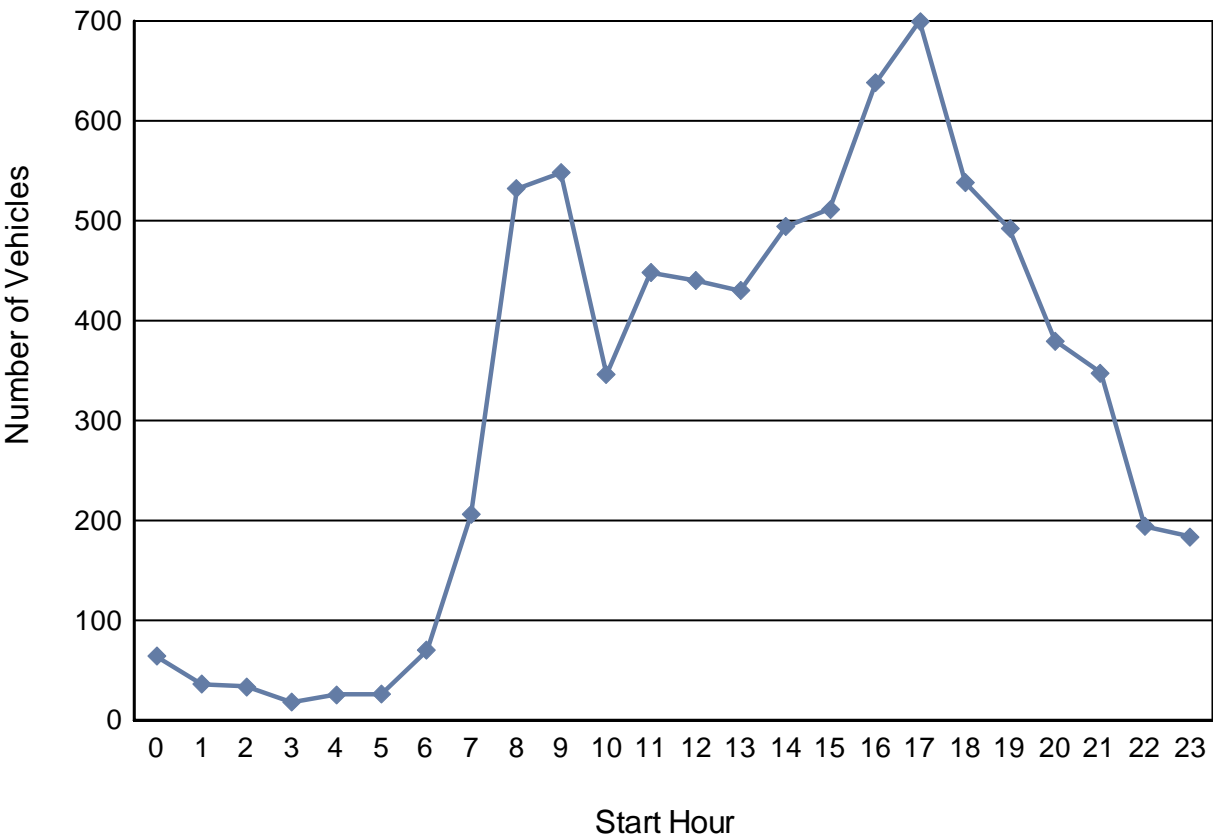
QUEENS QUAY W/B E OF YONGE ST

Westbound

Station Number: 14919

Artery Code: 14919

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
65	37	34	19	26	27	71	207	533	549	347	449	441	431	495	512	639	700	539	493	380	348	195	184

Comment:

Graphical 24-Hour Count Summary Report

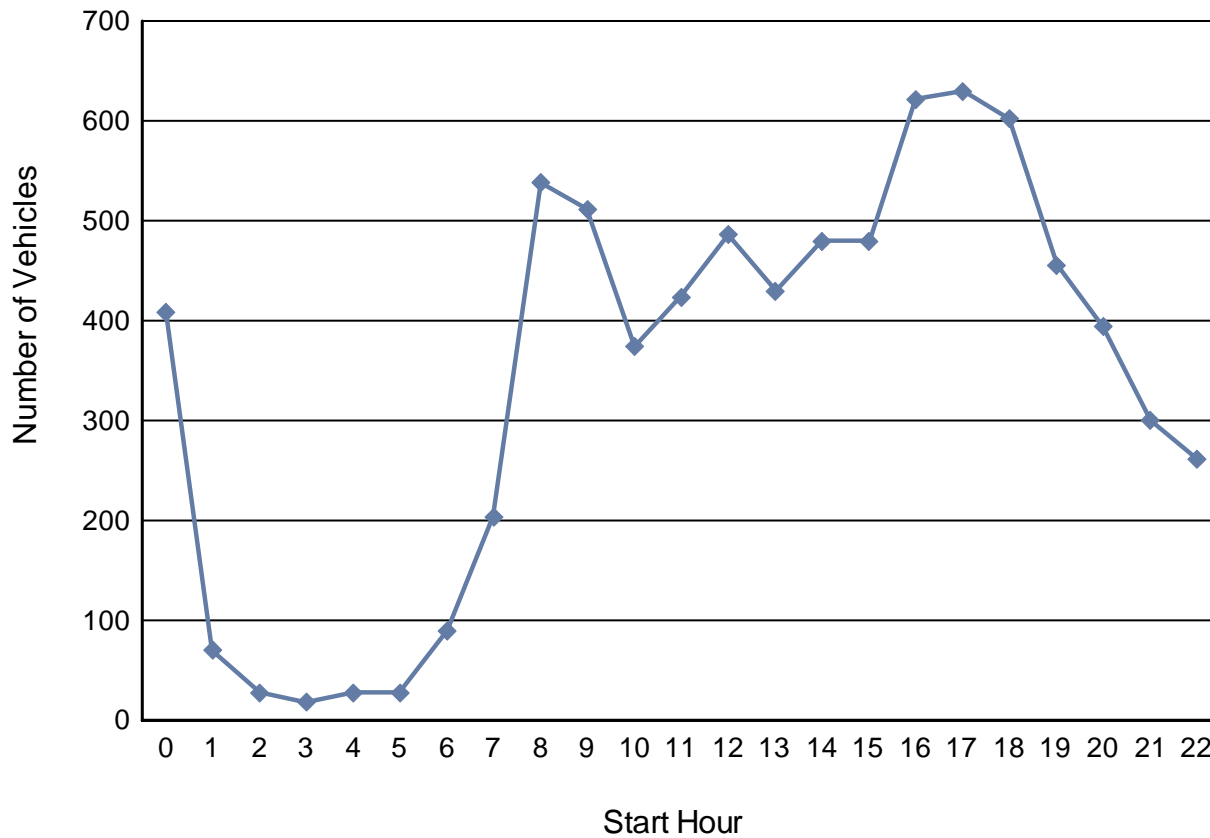
QUEENS QUAY W/B E OF YONGE ST

Station Number: 14919

Westbound

Artery Code: 14919

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
409	71	28	19	28	28	90	204	539	512	375	424	487	430	480	480	622	630	603	456	395	301	262

Comment:

Graphical 24-Hour Count Summary Report

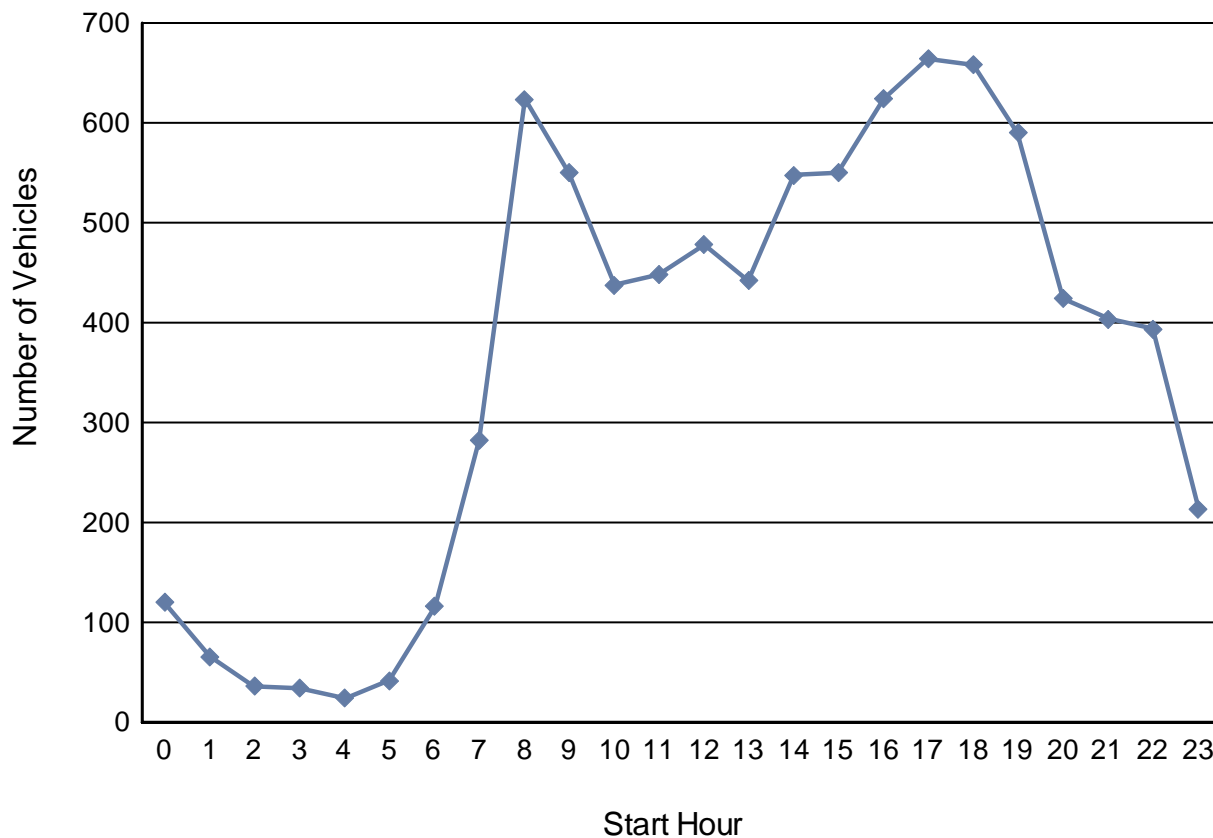
QUEENS QUAY W/B E OF BAY ST

Station Number: 14921

Westbound

Artery Code: 14921

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
121	66	37	35	25	42	117	283	624	551	438	449	479	443	548	551	625	665	659	591	425	404	394	214

Comment:

Graphical 24-Hour Count Summary Report

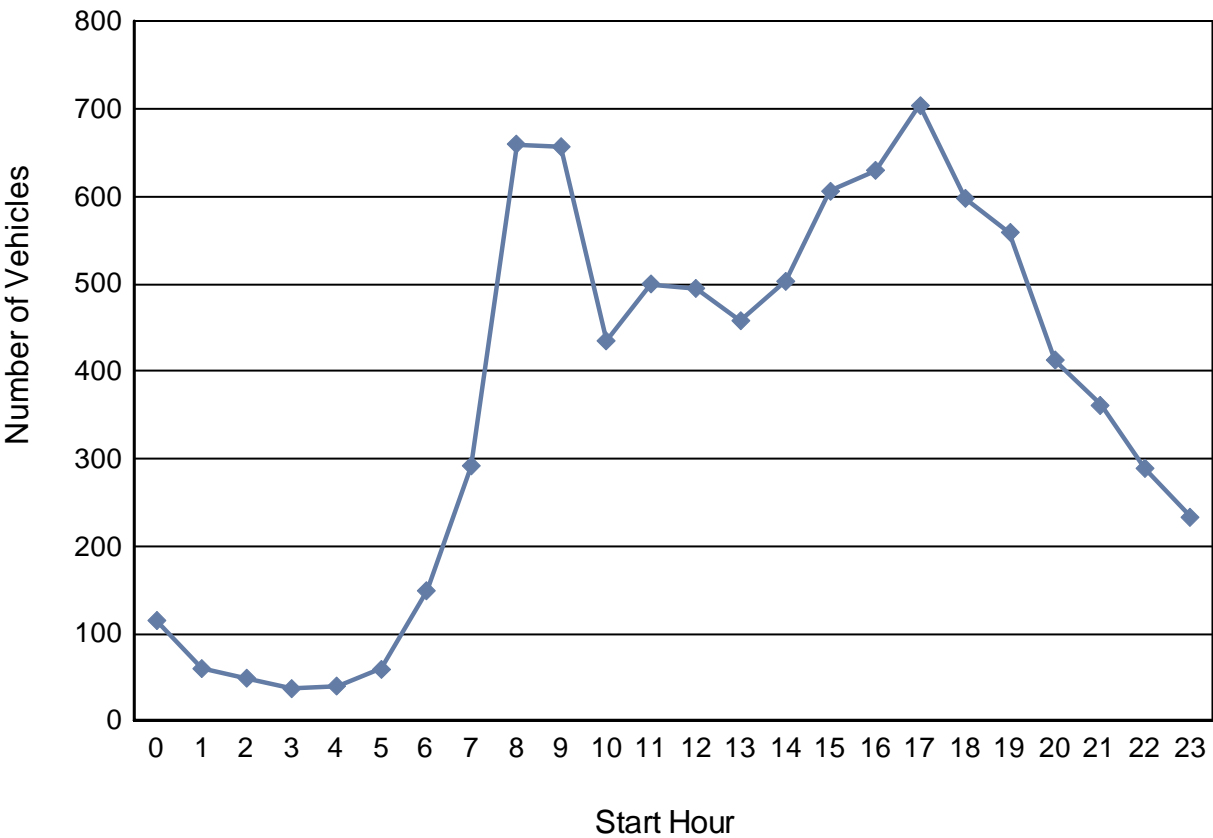
QUEENS QUAY W/B E OF BAY ST

Westbound

Station Number: 14921

Artery Code: 14921

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
115	60	49	37	40	59	149	292	660	657	435	500	495	458	503	606	630	704	598	559	413	361	289	233

Comment:

Graphical 24-Hour Count Summary Report

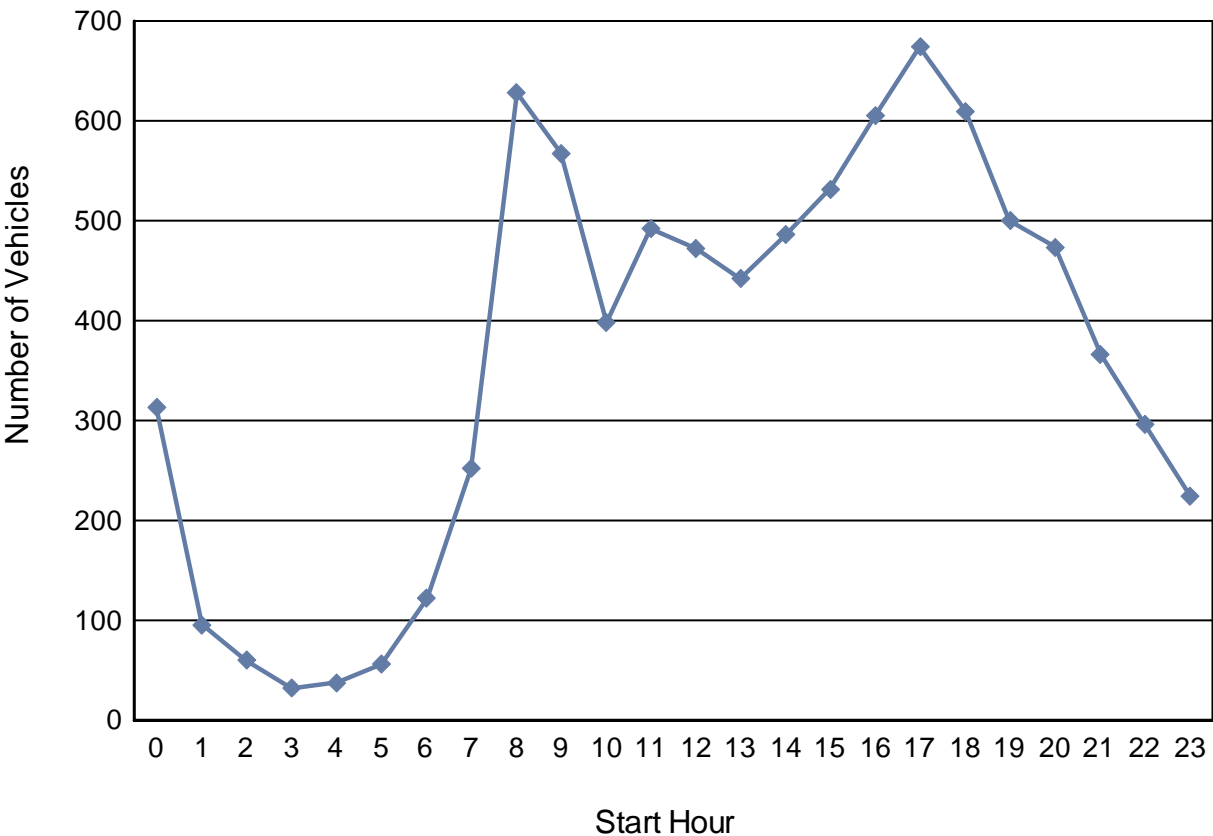
QUEENS QUAY W/B E OF BAY ST

Westbound

Station Number: 14921

Artery Code: 14921

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
314	96	61	33	38	57	123	253	629	568	399	493	473	443	487	532	606	675	610	501	474	367	297	225

Comment:

Graphical 24-Hour Count Summary Report

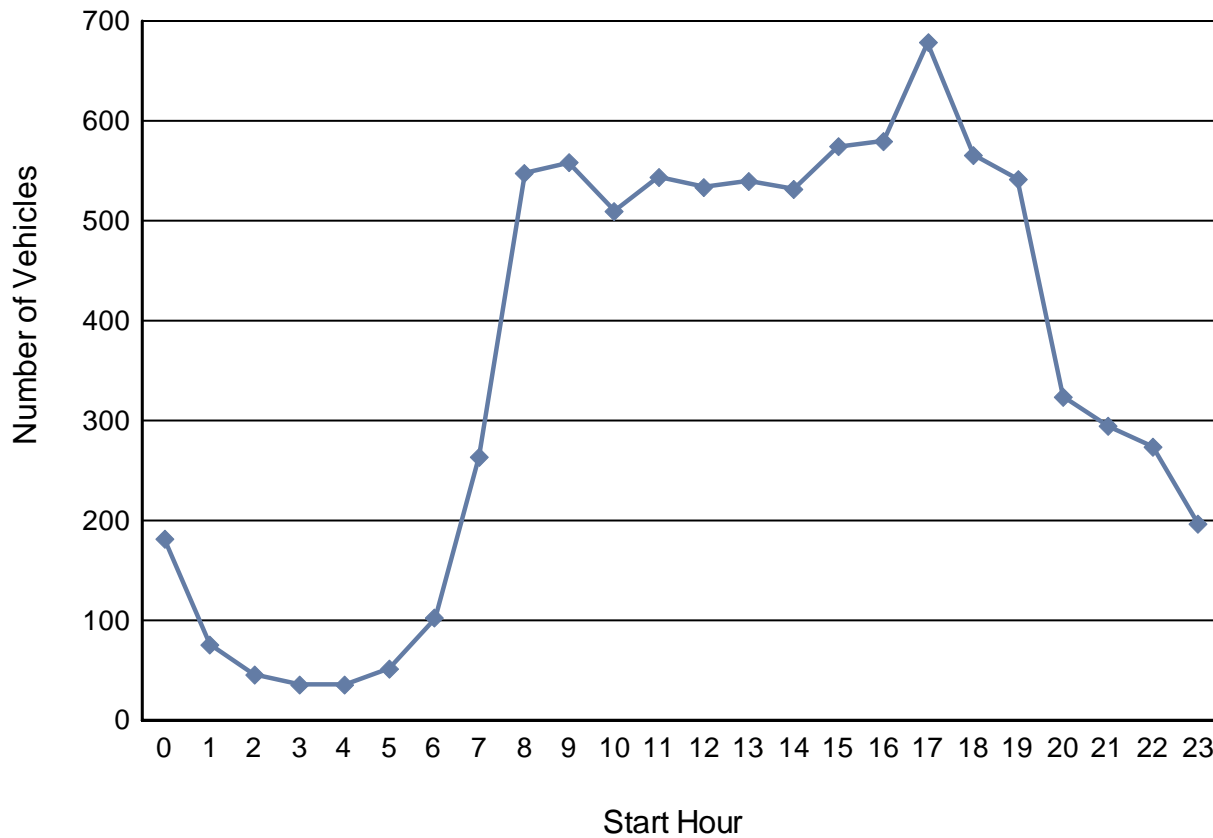
QUEENS QUAY E/B W OF YONGE ST

Station Number: 14920

Eastbound

Artery Code: 14920

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
182	76	46	36	36	52	103	264	548	559	510	544	534	540	532	575	580	679	566	542	324	295	274	197

Comment:

Graphical 24-Hour Count Summary Report

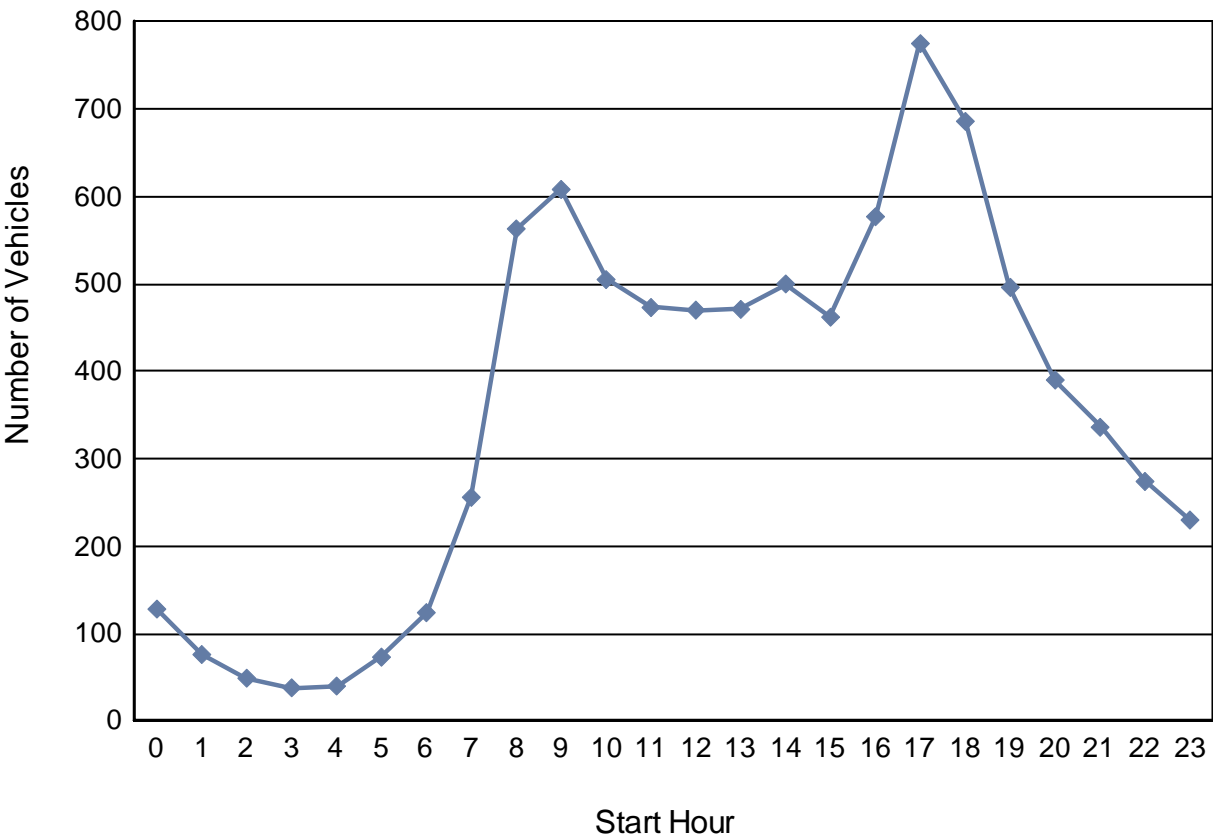
QUEENS QUAY E/B W OF YONGE ST

Eastbound

Station Number: 14920

Artery Code: 14920

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
128	76	49	38	40	73	124	256	563	608	505	473	470	471	500	462	577	775	686	496	390	336	274	230

Comment:

Graphical 24-Hour Count Summary Report

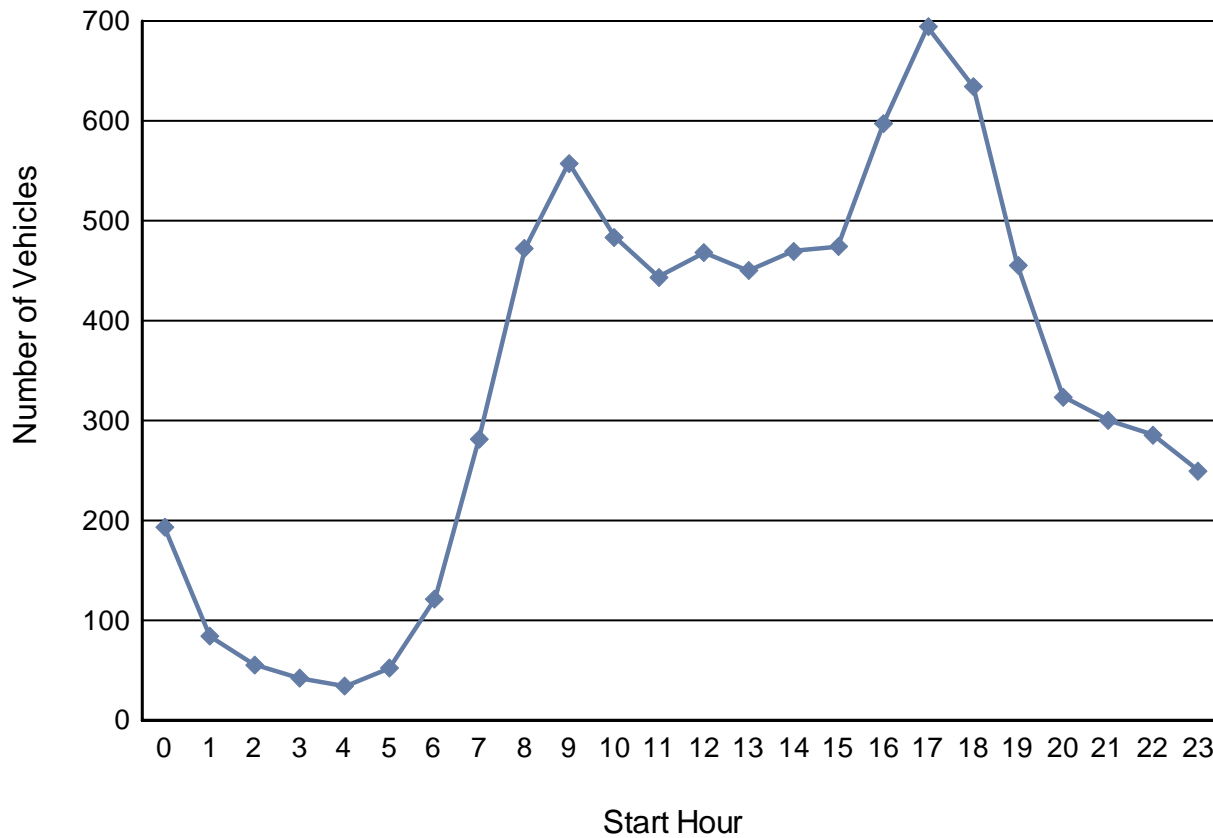
QUEENS QUAY E/B W OF YONGE ST

Station Number: 14920

Eastbound

Artery Code: 14920

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
194	85	56	43	35	53	122	282	473	558	484	444	469	451	470	475	598	695	635	456	324	301	286	250

Comment:

Graphical 24-Hour Count Summary Report

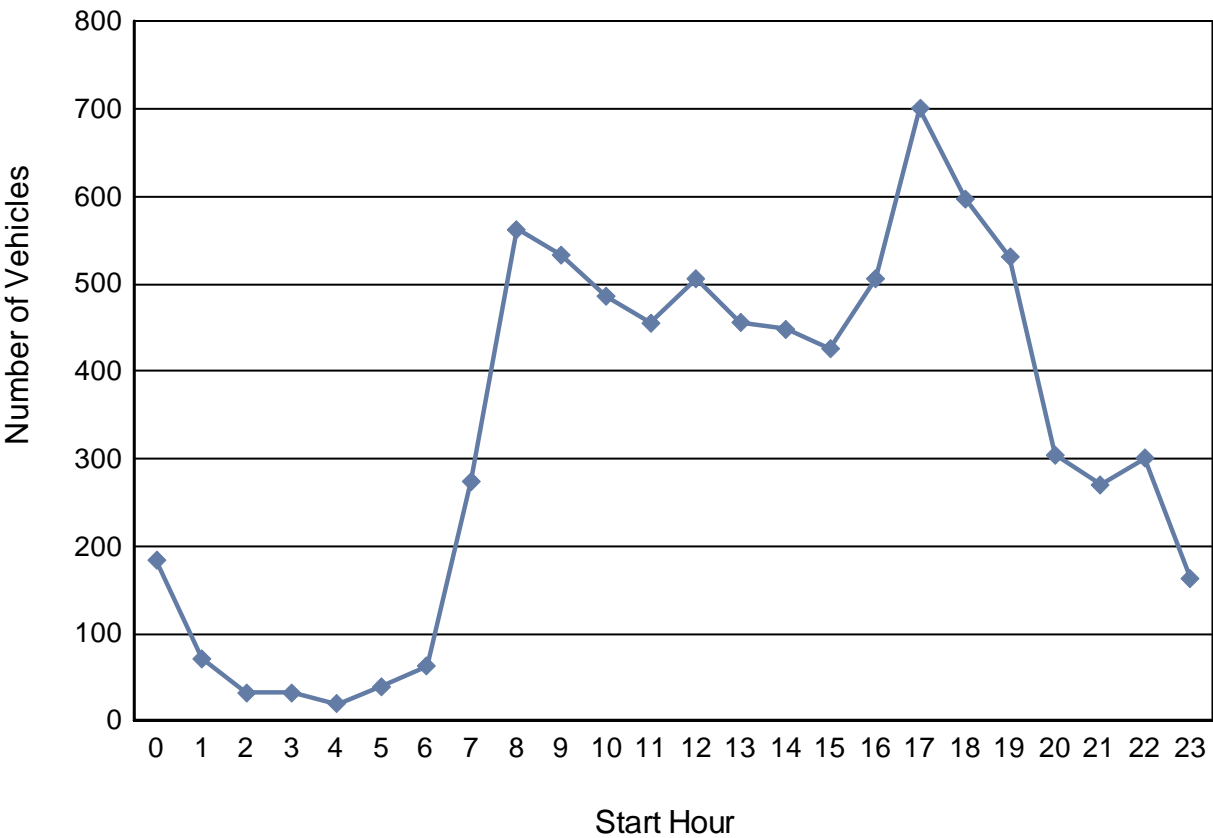
QUEENS QUAY E/B W OF BAY ST

Eastbound

Station Number: 14922

Artery Code: 14922

Category: 24 HOUR



Survey Date: Tue, September 27, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
184	71	32	32	20	39	63	274	562	533	486	455	506	456	448	426	506	701	597	531	304	270	301	163

Comment:

Graphical 24-Hour Count Summary Report

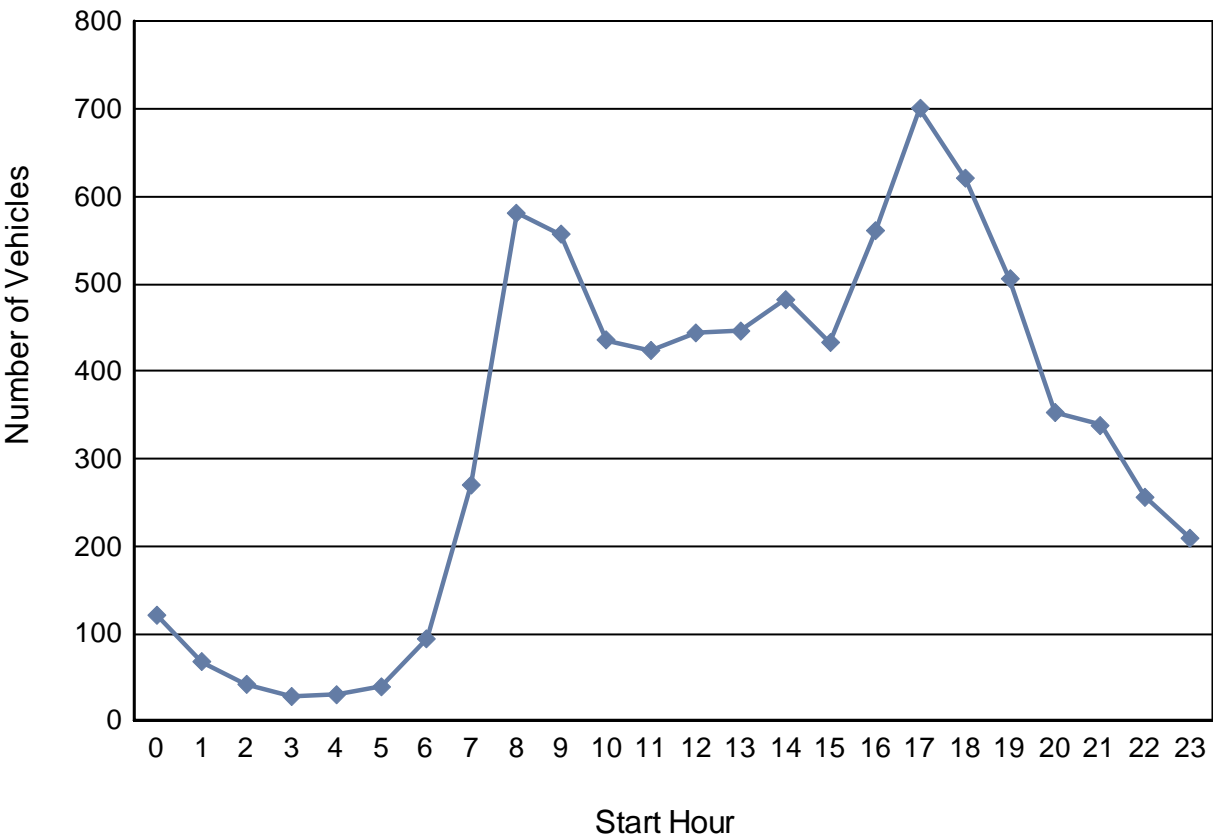
QUEENS QUAY E/B W OF BAY ST

Eastbound

Station Number: 14922

Artery Code: 14922

Category: 24 HOUR



Survey Date: Wed, September 28, 2005

Start Hour By Hour Volume:

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
121	68	42	28	30	39	94	270	581	557	436	424	444	446	482	433	561	701	621	506	353	338	256	209

Comment:

Graphical 24-Hour Count Summary Report

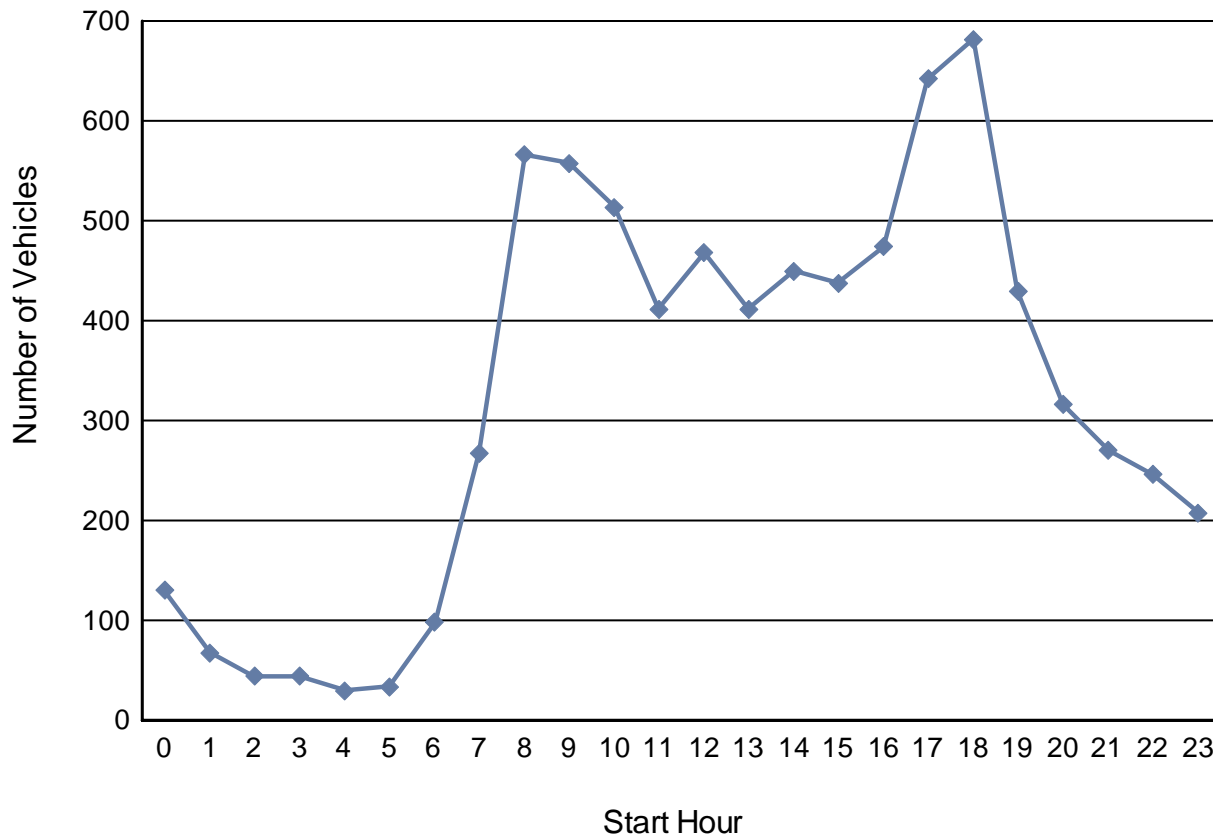
QUEENS QUAY E/B W OF BAY ST

Station Number: 14922

Eastbound

Artery Code: 14922

Category: 24 HOUR



Survey Date: Thu, September 29, 2005

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
131	68	45	45	30	34	99	268	567	558	514	412	469	412	450	438	475	643	682	430	317	271	247	208

Comment:

24-Hour Count Summary Report

F G GARDINER EXPY	STAT CODE	ARTERY CODE	COUNT DATE	AM PEAK	AM PEAK HOUR	PM PEAK	PM PEAK HOUR	OFF HOUR PEAK	OFF HOUR PEAK HOUR	24 HOUR Total
Eastbound		Category: RESCU								
F G GARDINER EXPY E/B E OF PARLIAMENT ST	DE0040DEG	3184	3/1/11 Tue	3,732	07:30 - 08:30	4,599	16:45 - 17:45	3,780	14:30 - 15:30	57,707
F G GARDINER EXPY E/B E OF PARLIAMENT ST	DE0040DEG	3184	3/2/11 Wed	3,804	08:00 - 09:00	4,354	15:30 - 16:30	3,778	14:30 - 15:30	58,093
F G GARDINER EXPY E/B E OF PARLIAMENT ST	DE0040DEG	3184	3/3/11 Thu	3,585	07:30 - 08:30	4,785	16:45 - 17:45	3,852	14:30 - 15:30	58,636
Eastbound Total:				<u>11,121</u>		<u>13,738</u>		<u>11,410</u>		<u>174,436</u>
Eastbound Average:				<u>3,707</u>		<u>4,579</u>		<u>3,803</u>		<u>58,145</u>
Westbound		Category: RESCU								
F G GARDINER EXPY W/B E OF PARLIAMENT ST	DE0040DWG	3185	3/1/11 Tue	4,950	07:30 - 08:30	3,016	16:00 - 17:00	3,595	09:30 - 10:30	54,181
F G GARDINER EXPY W/B E OF PARLIAMENT ST	DE0040DWG	3185	3/2/11 Wed	5,041	07:45 - 08:45	3,205	17:15 - 18:15	3,488	09:30 - 10:30	53,817
F G GARDINER EXPY W/B E OF PARLIAMENT ST	DE0040DWG	3185	3/3/11 Thu	4,894	07:30 - 08:30	3,200	17:00 - 18:00	3,563	09:30 - 10:30	56,318
Westbound Total:				<u>14,885</u>		<u>9,421</u>		<u>10,646</u>		<u>164,316</u>
Westbound Average:				<u>4,962</u>		<u>3,140</u>		<u>3,549</u>		<u>54,772</u>
F G GARDINER EXPY				<u>26,006</u>		<u>23,159</u>		<u>22,056</u>		<u>338,752</u>

Comment:

Graphical 24-Hour Count Summary Report

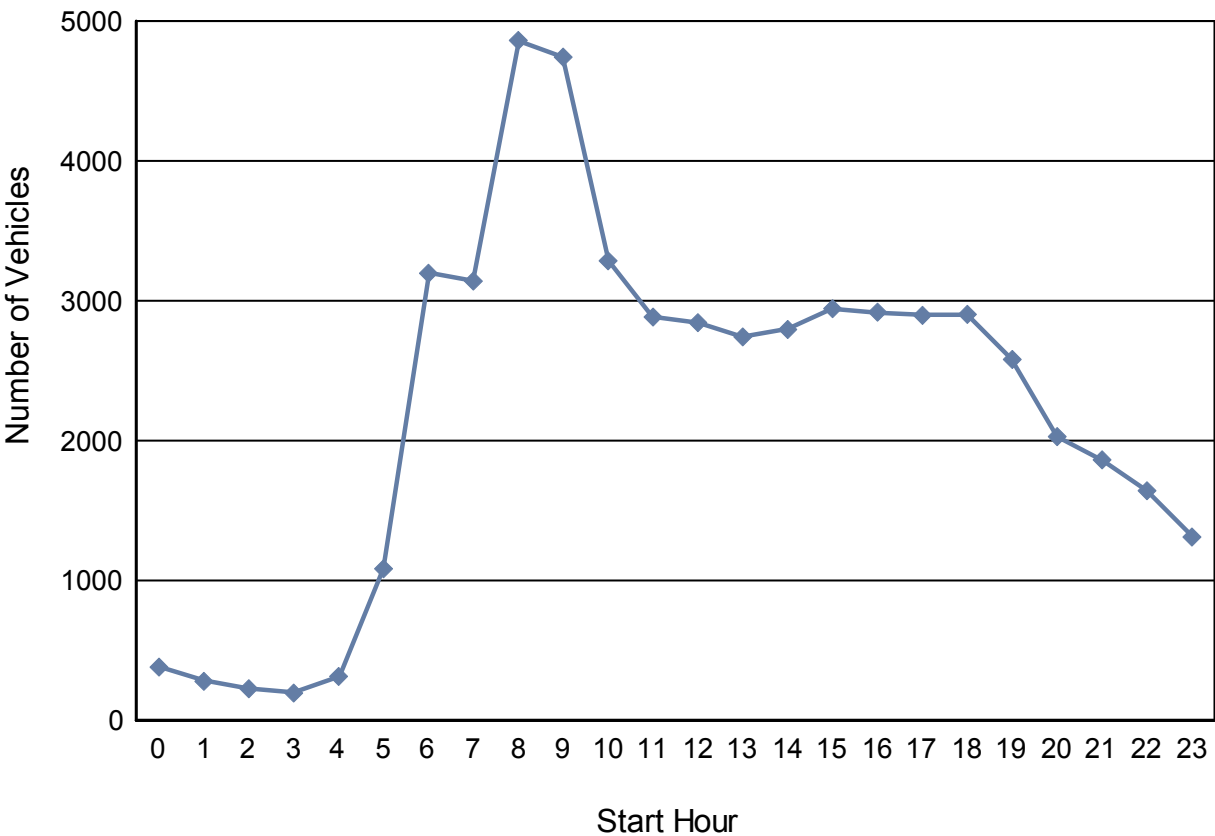
F G GARDINER EXPY W/B E OF PARLIAMENT ST

Station Number: DE0040DWG

Westbound

Artery Code: 3185

Category: RESCU



Survey Date: Tue, March 1, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
386	284	231	200	319	1089	3202	3146	4867	4748	3291	2889	2849	2747	2800	2949	2924	2901	2908	2586	2034	1868	1647	1316

Comment:

Graphical 24-Hour Count Summary Report

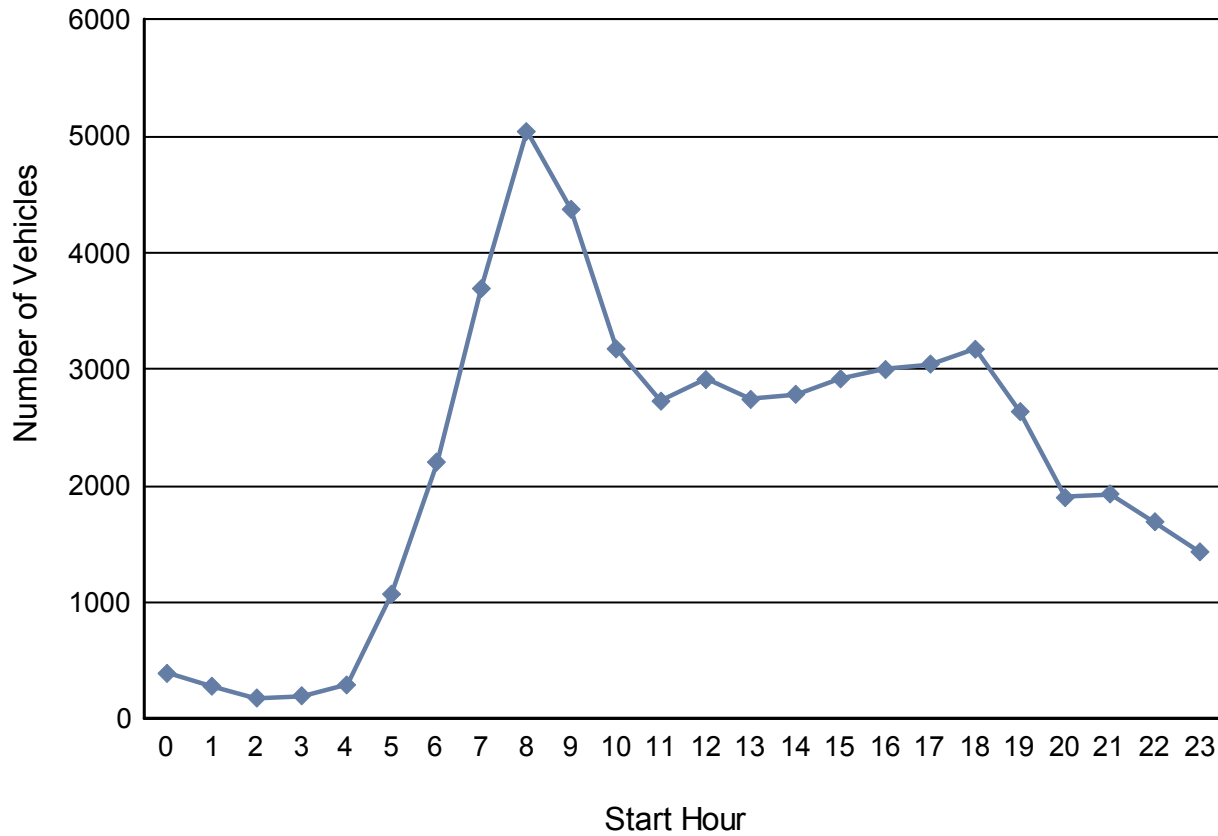
F G GARDINER EXPY W/B E OF PARLIAMENT ST

Station Number: DE0040DWG

Westbound

Artery Code: 3185

Category: RESCU



Survey Date: Wed, March 2, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
392	282	181	200	293	1072	2205	3694	5041	4374	3177	2728	2913	2743	2787	2919	2999	3046	3173	2638	1900	1932	1693	1435

Comment:

Graphical 24-Hour Count Summary Report

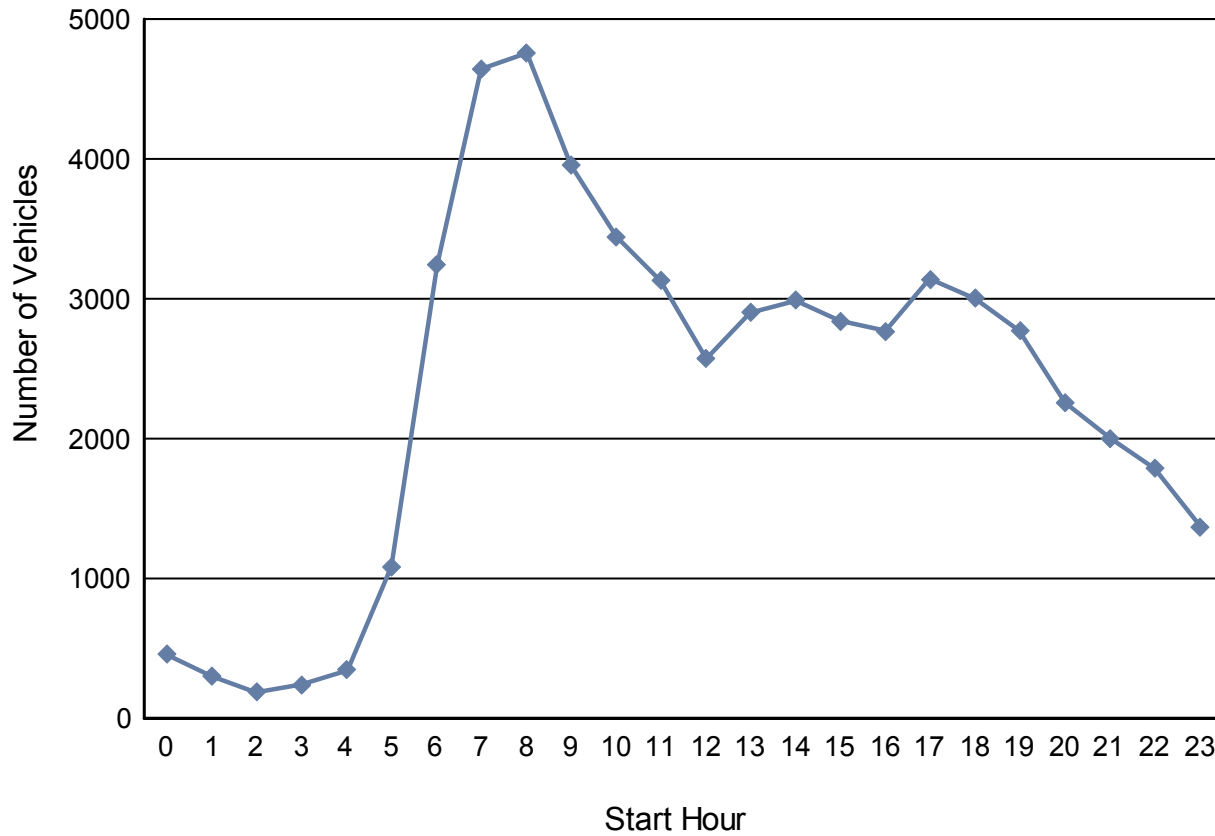
F G GARDINER EXPY W/B E OF PARLIAMENT ST

Station Number: DE0040DWG

Westbound

Artery Code: 3185

Category: RESCU



Survey Date: Thu, March 3, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
465	307	195	243	354	1087	3249	4648	4763	3962	3447	3137	2579	2909	2997	2843	2770	3142	3011	2777	2262	2005	1794	1372

Comment:

Graphical 24-Hour Count Summary Report

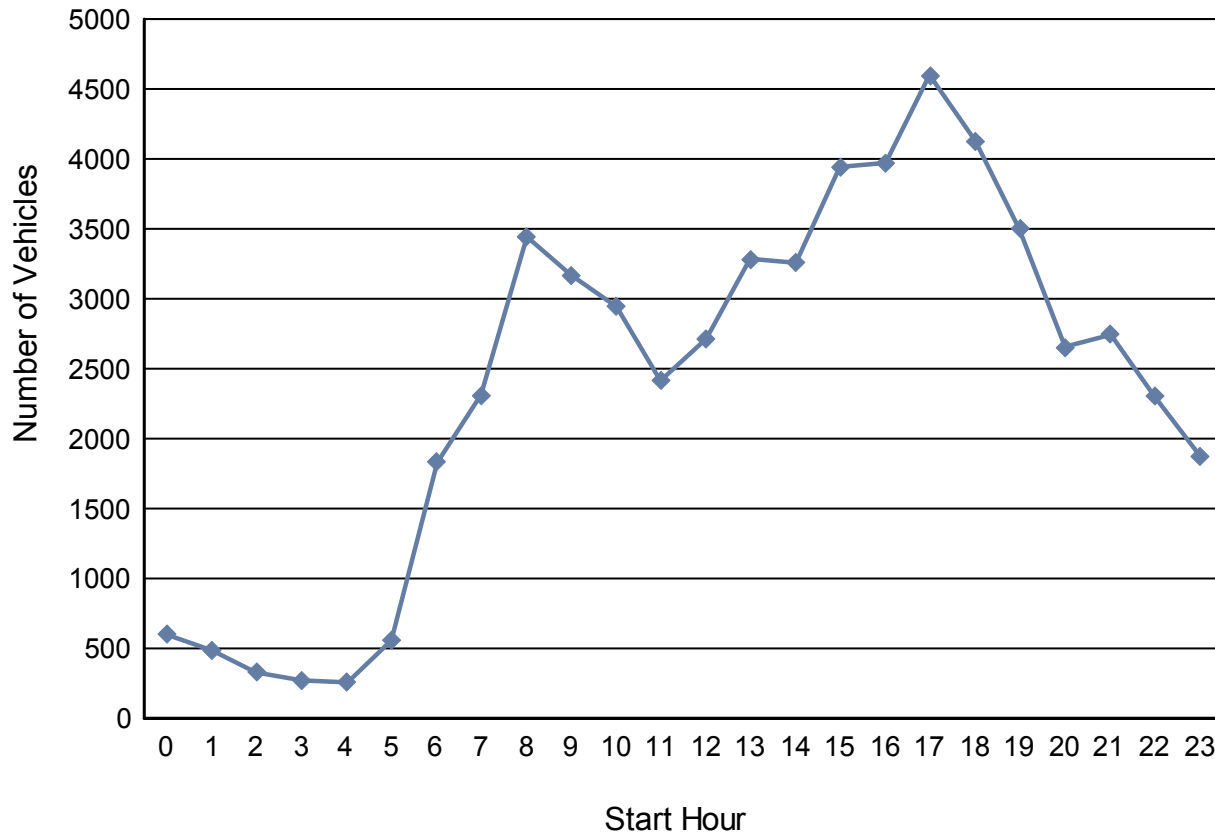
F G GARDINER EXPY E/B E OF PARLIAMENT ST

Station Number: DE0040DEG

Eastbound

Artery Code: 3184

Category: RESCU



Survey Date: Tue, March 1, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
608	491	337	275	265	564	1840	2312	3448	3171	2952	2422	2718	3285	3265	3946	3975	4599	4130	3508	2655	2753	2310	1878

Comment:

Graphical 24-Hour Count Summary Report

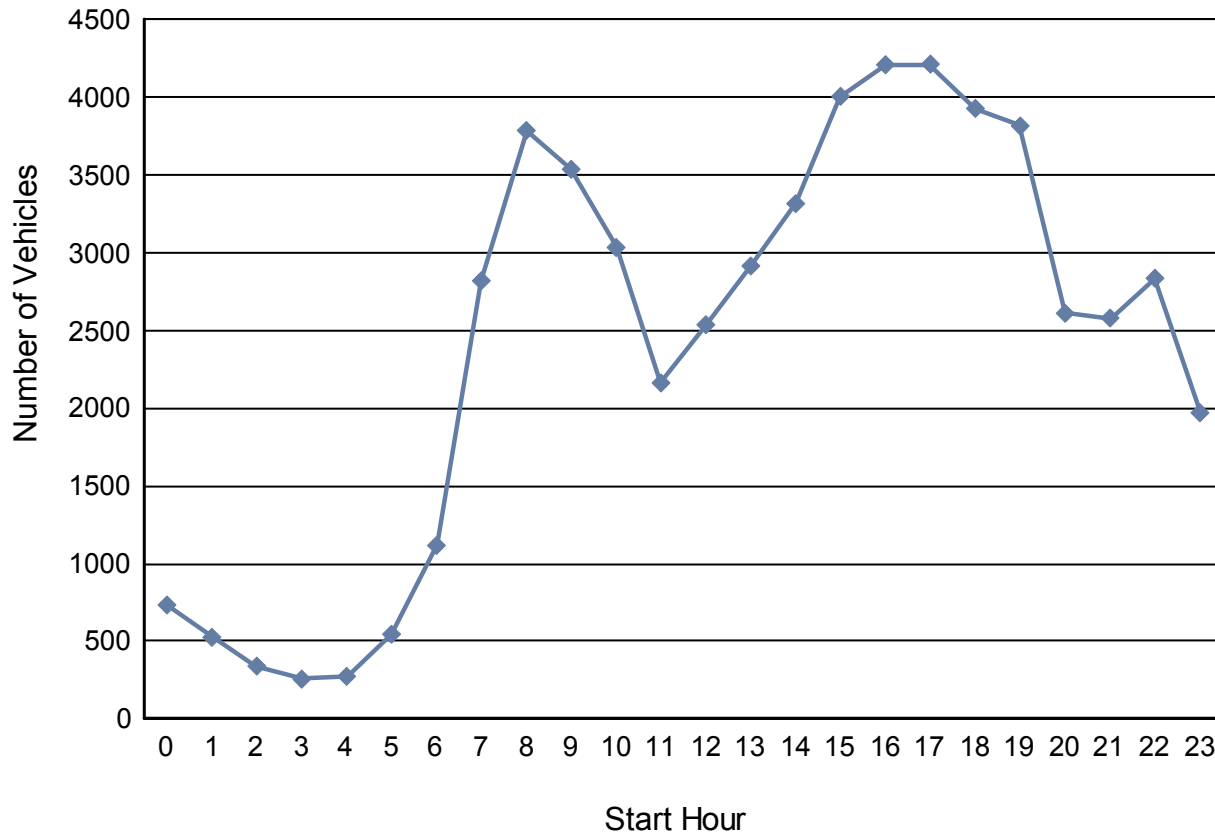
F G GARDINER EXPY E/B E OF PARLIAMENT ST

Station Number: DE0040DEG

Eastbound

Artery Code: 3184

Category: RESCU



Survey Date: Wed, March 2, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
734	526	341	257	275	546	1117	2821	3788	3538	3035	2163	2538	2916	3317	4008	4211	4215	3930	3817	2611	2581	2837	1971

Comment:

Graphical 24-Hour Count Summary Report

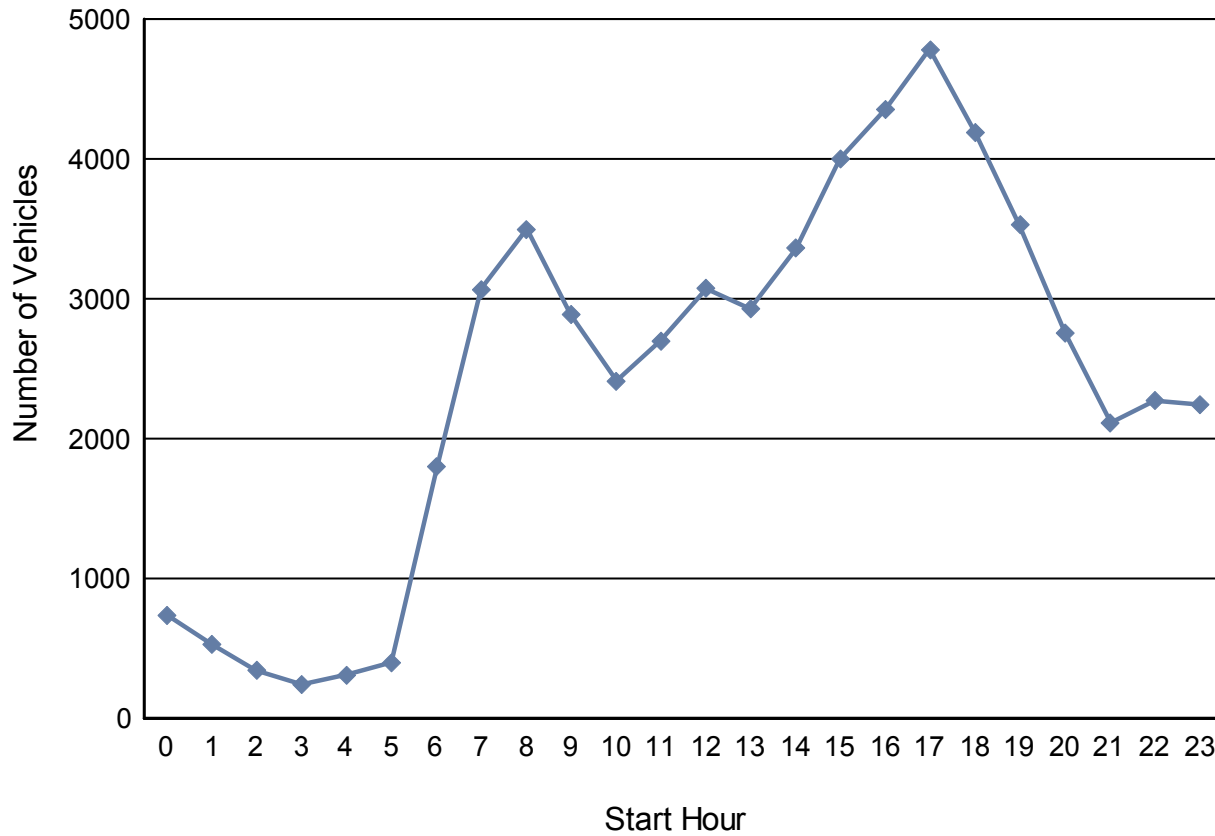
F G GARDINER EXPY E/B E OF PARLIAMENT ST

Station Number: DE0040DEG

Eastbound

Artery Code: 3184

Category: RESCU



Survey Date: Thu, March 3, 2011

Start Hour By Hour Volume:

<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>
741	534	349	247	313	402	1805	3070	3500	2893	2415	2702	3081	2934	3369	4005	4359	4785	4194	3535	2760	2117	2278	2248

Comment:

Turning Movement Count Summary Report

LAKE SHORE BLVD AT SHERBOURNE ST

Survey Date: 2007-Aug-08 (Wednesday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				Exits	EASTBOUND				Exits	SOUTHBOUND				Exits	WESTBOUND				Total	Peds	Bike	Other
			Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total				
08:00-09:00 AM PEAK	CAR	400	6	47	2	55	312	243	294	25	562	116	16	79	124	219	1,054	12	924	110	1,046	N	2	19	0
	TRK	11	0	3	0	3	45	6	41	4	51	11	4	7	4	15	80	0	76	2	78	S	7	7	0
	BUS	2	1	0	1	2	12	1	3	0	4	2	8	2	0	10	11	0	10	1	11	E	21	0	0
																						W	9	6	0
TOTAL:		413	7	50	3	60	369	250	338	29	617	129	28	88	128	244	1,145	12	1,010	113	1,135				
17:00-18:00 PM PEAK	CAR	310	26	78	22	126	665	193	575	16	784	117	68	90	267	425	1,209	11	916	39	966	N	2	42	0
	TRK	3	2	1	0	3	36	2	34	0	36	8	2	8	4	14	50	0	44	0	44	S	6	13	0
	BUS	3	0	1	1	2	12	1	2	0	3	0	9	0	0	9	6	0	6	1	7	E	28	1	0
																						W	20	2	0
TOTAL:		316	28	80	23	131	713	196	611	16	823	125	79	98	271	448	1,265	11	966	40	1,017				
OFF HR AVG	CAR	214	17	43	6	66	351	121	312	25	458	102	33	67	146	246	798	10	635	50	695	N	3	7	0
	TRK	11	0	1	0	1	69	7	64	1	72	6	5	5	4	14	87	0	83	3	86	S	3	5	0
	BUS	4	1	2	1	4	13	1	4	0	5	1	8	1	0	9	10	0	9	1	10	E	11	1	0
																						W	8	1	0
TOTAL:		229	18	46	7	71	433	129	380	26	535	109	46	73	150	269	895	10	727	54	791				
07:30-09:30 2 HR AM	CAR	673	19	86	3	108	671	398	634	59	1,091	198	34	120	244	398	1,857	19	1,594	189	1,802	N	2	35	0
	TRK	42	1	19	2	22	104	17	95	5	117	12	7	7	12	26	169	0	156	6	162	S	11	12	0
	BUS	3	1	0	2	3	24	2	7	0	9	2	15	2	0	17	16	0	15	1	16	E	34	1	0
																						W	21	7	0
TOTAL:		718	21	105	7	133	799	417	736	64	1,217	212	56	129	256	441	2,042	19	1,765	196	1,980				
16:00-18:00 2 HR PM	CAR	560	50	126	34	210	1,182	356	1,038	43	1,437	243	110	180	514	804	2,251	20	1,687	78	1,785	N	5	52	0
	TRK	7	4	2	0	6	80	4	77	0	81	16	3	16	10	29	108	0	94	1	95	S	9	22	0
	BUS	5	0	1	2	3	23	2	4	0	6	1	17	1	0	18	11	0	11	2	13	E	46	2	0
																						W	34	3	0
TOTAL:		572	54	129	36	219	1,285	362	1,119	43	1,524	260	130	197	524	851	2,370	20	1,792	81	1,893				
07:30-18:00 8 HR SUM	CAR	2,086	138	382	62	582	3,258	1,237	2,921	200	4,358	846	275	566	1,340	2,181	7,297	80	5,819	467	6,366	N	17	116	0
	TRK	92	6	26	2	34	459	47	428	7	482	49	29	41	39	109	626	1	581	19	601	S	33	52	0
	BUS	19	4	8	9	21	100	6	28	0	34	7	63	7	0	70	67	0	63	5	68	E	124	5	0
																						W	85	14	0
TOTAL:		2,197	148	416	73	637	3,817	1,290	3,377	207	4,874	902	367	614	1,379	2,360	7,990	81	6,463	491	7,035				

Total 8 Hour Vehicle Volume: 14,906

Total 8 Hour Bicycle Volume: 187

Total 8 Hour Intersection Volume: 15,093

Comment:

Turning Movement Count Summary Report

LOWER SHERBOURNE ST AT QUEENS QUAY

Survey Date: 2003-Dec-01 (Monday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				Exits	EASTBOUND				Exits	SOUTHBOUND				Exits	WESTBOUND				Total	Peds	Bike	Other
			Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total				
08:15-09:15 AM PEAK	CAR	81	8	3	6	17	207	53	195	5	253	14	6	2	62	70	678	7	608	25	640	N	8	0	0
	TRK	4	0	0	0	0	8	3	8	0	11	0	0	0	4	4	30	0	26	1	27	S	2	0	0
	BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	0	0	0	0	E	1	0	0
																					W	1	0	0	
TOTAL:		85	8	3	6	17	215	56	203	5	264	14	6	2	72	80	714	7	634	26	667				
17:00-18:00 PM PEAK	CAR	85	2	4	1	7	459	60	453	6	519	16	5	3	104	112	457	7	351	21	379	N	4	0	0
	TRK	3	0	0	0	0	22	2	22	0	24	0	0	0	1	1	18	0	17	1	18	S	4	0	0
	BUS	0	0	0	0	0	1	0	1	0	1	0	0	0	6	6	6	0	0	0	0	E	1	0	0
																					W	1	0	0	
TOTAL:		88	2	4	1	7	482	62	476	6	544	16	5	3	111	119	481	7	368	22	397				
OFF HR AVG	CAR	51	8	7	4	19	188	29	175	8	212	18	9	6	55	70	271	4	208	15	227	N	4	0	0
	TRK	7	1	0	0	1	22	3	22	1	26	1	0	0	4	4	25	0	20	4	24	S	4	0	0
	BUS	1	0	0	0	0	1	1	1	0	2	0	0	0	5	5	5	0	0	0	0	E	2	0	0
																					W	2	0	0	
TOTAL:		59	9	7	4	20	211	33	198	9	240	19	9	6	64	79	301	4	228	19	251				
07:30-09:30 2 HR AM	CAR	134	9	5	8	22	333	82	311	12	405	26	14	3	113	130	1,184	11	1,062	47	1,120	N	10	0	0
	TRK	7	0	1	0	1	18	3	16	1	20	1	2	0	9	11	65	0	56	3	59	S	8	0	0
	BUS	0	0	0	0	0	0	0	0	0	0	0	0	0	12	12	15	0	3	0	3	E	2	0	0
																					W	1	0	0	
TOTAL:		141	9	6	8	23	351	85	327	13	425	27	16	3	134	153	1,264	11	1,121	50	1,182				
16:00-18:00 2 HR PM	CAR	142	9	10	8	27	807	91	786	13	890	40	13	7	198	218	802	20	595	41	656	N	14	0	0
	TRK	5	0	0	0	0	44	2	44	0	46	0	0	0	4	4	31	0	27	3	30	S	15	0	0
	BUS	0	0	0	0	0	2	0	2	0	2	0	0	0	12	12	13	0	1	0	1	E	4	0	0
																					W	5	0	0	
TOTAL:		147	9	10	8	27	853	93	832	13	938	40	13	7	214	234	846	20	623	44	687				
07:30-18:00 8 HR SUM	CAR	477	51	43	33	127	1,892	288	1,798	58	2,144	139	61	35	532	628	3,073	46	2,490	146	2,682	N	41	0	0
	TRK	38	2	1	1	4	151	15	147	3	165	3	3	0	27	30	191	0	162	22	184	S	37	0	0
	BUS	2	0	0	0	0	7	2	6	0	8	0	1	0	43	44	48	0	5	0	5	E	15	0	0
																					W	15	0	0	
TOTAL:		517	53	44	34	131	2,050	305	1,951	61	2,317	142	65	35	602	702	3,312	46	2,657	168	2,871				

Total 8 Hour Vehicle Volume: 6,021

Total 8 Hour Bicycle Volume: 0

Total 8 Hour Intersection Volume: 6,021

Comment:

Turning Movement Count Summary Report

LAKE SHORE BLVD AT SHERBOURNE ST

Survey Date: 2007-Aug-08 (Wednesday)

Survey Type: Routine Hours

Time Period	Vehicle Type	Exits	NORTHBOUND				Exits	EASTBOUND				Exits	SOUTHBOUND				Exits	WESTBOUND				Total	Peds	Bike	Other
			Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total		Left	Thru	Right	Total				
08:00-09:00 AM PEAK	CAR	400	6	47	2	55	312	243	294	25	562	116	16	79	124	219	1,054	12	924	110	1,046	N	2	19	0
	TRK	11	0	3	0	3	45	6	41	4	51	11	4	7	4	15	80	0	76	2	78	S	7	7	0
	BUS	2	1	0	1	2	12	1	3	0	4	2	8	2	0	10	11	0	10	1	11	E	21	0	0
																						W	9	6	0
TOTAL:		413	7	50	3	60	369	250	338	29	617	129	28	88	128	244	1,145	12	1,010	113	1,135				
17:00-18:00 PM PEAK	CAR	310	26	78	22	126	665	193	575	16	784	117	68	90	267	425	1,209	11	916	39	966	N	2	42	0
	TRK	3	2	1	0	3	36	2	34	0	36	8	2	8	4	14	50	0	44	0	44	S	6	13	0
	BUS	3	0	1	1	2	12	1	2	0	3	0	9	0	0	9	6	0	6	1	7	E	28	1	0
																						W	20	2	0
TOTAL:		316	28	80	23	131	713	196	611	16	823	125	79	98	271	448	1,265	11	966	40	1,017				
OFF HR AVG	CAR	214	17	43	6	66	351	121	312	25	458	102	33	67	146	246	798	10	635	50	695	N	3	7	0
	TRK	11	0	1	0	1	69	7	64	1	72	6	5	5	4	14	87	0	83	3	86	S	3	5	0
	BUS	4	1	2	1	4	13	1	4	0	5	1	8	1	0	9	10	0	9	1	10	E	11	1	0
																						W	8	1	0
TOTAL:		229	18	46	7	71	433	129	380	26	535	109	46	73	150	269	895	10	727	54	791				
07:30-09:30 2 HR AM	CAR	673	19	86	3	108	671	398	634	59	1,091	198	34	120	244	398	1,857	19	1,594	189	1,802	N	2	35	0
	TRK	42	1	19	2	22	104	17	95	5	117	12	7	7	12	26	169	0	156	6	162	S	11	12	0
	BUS	3	1	0	2	3	24	2	7	0	9	2	15	2	0	17	16	0	15	1	16	E	34	1	0
																						W	21	7	0
TOTAL:		718	21	105	7	133	799	417	736	64	1,217	212	56	129	256	441	2,042	19	1,765	196	1,980				
16:00-18:00 2 HR PM	CAR	560	50	126	34	210	1,182	356	1,038	43	1,437	243	110	180	514	804	2,251	20	1,687	78	1,785	N	5	52	0
	TRK	7	4	2	0	6	80	4	77	0	81	16	3	16	10	29	108	0	94	1	95	S	9	22	0
	BUS	5	0	1	2	3	23	2	4	0	6	1	17	1	0	18	11	0	11	2	13	E	46	2	0
																						W	34	3	0
TOTAL:		572	54	129	36	219	1,285	362	1,119	43	1,524	260	130	197	524	851	2,370	20	1,792	81	1,893				
07:30-18:00 8 HR SUM	CAR	2,086	138	382	62	582	3,258	1,237	2,921	200	4,358	846	275	566	1,340	2,181	7,297	80	5,819	467	6,366	N	17	116	0
	TRK	92	6	26	2	34	459	47	428	7	482	49	29	41	39	109	626	1	581	19	601	S	33	52	0
	BUS	19	4	8	9	21	100	6	28	0	34	7	63	7	0	70	67	0	63	5	68	E	124	5	0
																						W	85	14	0
TOTAL:		2,197	148	416	73	637	3,817	1,290	3,377	207	4,874	902	367	614	1,379	2,360	7,990	81	6,463	491	7,035				

Total 8 Hour Vehicle Volume: 14,906

Total 8 Hour Bicycle Volume: 187

Total 8 Hour Intersection Volume: 15,093

Comment:

HARBOUR STREET TRAFFIC VOLUMES - ALTERNATIVE 4



NOT TO SCALE

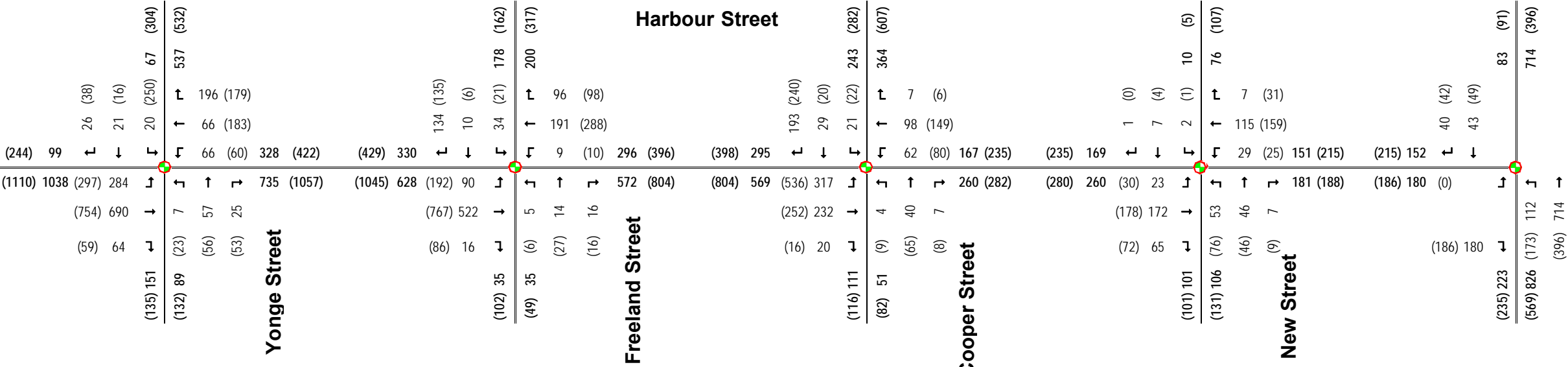
LEGEND

XX (XX)

WEEKDAY AM (PM) PEAK HOUR TRAFFIC VOLUMES



SIGNALIZED INTERSECTION



Adam Doiron

From: Rail Data Requests <RailDataRequests@metrolinx.com>
Sent: Thursday, February 4, 2021 5:39 PM
To: Adam Doiron
Cc: Brandon Gaffoor; Edmond Wu
Subject: RE: Rail Data Request - 39 Queens Quay E., Toronto

Hi Adam:

Sorry for the delay. Further to your request dated September 1, 2020, the subject lands (39 Queens Quay East, Toronto) are located adjacent to the Metrolinx Union Station Rail Corridor which carries Lakeshore East, Stouffville and Richmond Hill GO rail services.

It's anticipated that GO rail service at this location will be comprised of diesel and electric trains. The GO rail fleet combination on this Subdivision will consist of up to 2 locomotives and 12 passenger cars. The typical GO rail weekday train volume forecast on the eastern side of Union Station train shed, including both revenue and equipment trips is in the order of 854 trains. The planned detailed trip breakdown is listed below:

	1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives		1 Diesel Locomotive	2 Diesel Locomotives	1 Electric Locomotive	2 Electric Locomotives
Day (0700-2300)	102	53	488	66	Night (2300-0700)	23	3	87	32

The current design track design speed at this location is 45 mph (72 km/h).

There are no *anti-whistling by-laws* in effect near the subject lands.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO rail network and we are currently working towards the next phase. That's why, in addition to studying the environmental impacts of traditional electrification, Metrolinx has studied the feasibility of another form of electrification - hydrogen powered vehicles.

Both options have been studied as part of the Transit Project Assessment Process (TPAP) for the GO Expansion program, currently in the procurement phase. The successful proponent team will be responsible for selecting and delivering the right trains and infrastructure to unlock the benefits of GO Expansion. The contract is in a multi-year procurement process and teams are currently completing the bids that will close in 2021. GO Expansion construction will get underway in 2022.

Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. However, we can advise that train noise is dominated by the powertrain at lower speeds and by the wheel-track interaction at higher speeds. Hence, the noise level and spectrum of electric trains is expected to be very similar at higher speeds, if not identical, to those of equivalent diesel trains.

Given the above considerations, it would be prudent at this time, for the purposes of acoustical analyses for development in proximity to Metrolinx corridors, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future once the proponent team is selected.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability and passenger demand.

It should be noted that this information only pertains to Metrolinx rail service. It would be prudent to contact other rail operators in the area directly for rail traffic information pertaining to non-Metrolinx rail service.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

EDMOND WU, MCIP, RPP

Project Manager

Third Party Projects Review, Capital Projects Group

Metrolinx | 20 Bay Street | Suite 600 | Toronto | Ontario | M5J 2W3

T: 416.202.8513 | C: 437.240.8613



From: Rail Data Requests

Sent: October 28, 2020 10:07

To: Adam Doiron <adoiron@hgcengineering.com>

Subject: RE: Rail Data Request - 39 Queens Quay

Hi Adam:

I apologize for the delay in responding to your request. At this time, Metrolinx is continuing to refine GO Expansion Environmental Assessments as well as the associated rail traffic forecast updates. As such, we are not in a position to provide this information to you at present. We have been told that the EA process will be completed shortly, however, and we will be sure to contact you to provide the new data at that time.

Further to your request dated September 1, 2020, the subject property (39 Queens Quay East, Toronto) is located within proximity to Metrolinx's Union Station Rail Corridor which carries Lakeshore East, Richmond Hill and Stouffville GO Train services. We note we do not maintain information pertaining to idling and stationary activities at stations – that would be up to the consultant to collect that information for a typical weekday period.

The current track design speed at this location on this corridor is 45 mph (72 km/h).

There are no anti-whistling by-laws in place around the subject property.

With respect to future electrified rail service, Metrolinx is committed to finding the most sustainable solution for electrifying the GO and UP Express rail network and we are currently working towards the next phase. Metrolinx has not made a final decision regarding the electric train technology or technologies to be deployed. We can, however, provide the following interim information which may be helpful;

1. At lower speeds, train noise is dominated by the powertrain. At higher speeds, train noise is dominated by the wheel- track interaction. Hence, at higher speeds, the noise level and spectrum of electric trains is expected to be very similar, if not identical, to those of equivalent diesel trains.
2. Along with electrification, Metrolinx will intensify service levels along all of its corridors to deliver the promised GO Expansion service. Everything else being equal, this will likely result in an overall increase in train noise emissions.

Given the above considerations, it would be prudent, for the purposes of acoustical analyses, to assume that the acoustical characteristics of electrified and diesel trains are equivalent. In light of the aforementioned information, acoustical models should employ diesel train parameters as the basis for analyses. We anticipate that additional information regarding specific operational parameters for electrified trains will become available in the future.

Operational information is subject to change and may be influenced by, among other factors, service planning priorities, operational considerations, funding availability, and passenger demand.

It should be noted that this information is only as it pertains to Metrolinx trains. It would be prudent to contact other rail operators in the area directly for their rail traffic information.

I trust this information is useful. Should you have any questions or concerns, please do not hesitate to contact me.

EDMOND WU, MCIP, RPP

Project Manager



From: Adam Doiron [<mailto:adoiron@hgcengineering.com>]

Sent: Tuesday, September 01, 2020 1:18 PM

To: Rail Data Requests

Subject: Rail Data Request - 39 Queens Quay

Hello Brandon,

HGC is working on a noise study for a development at 39 Queens Quay in Toronto. We have fairly recent data for the GO train operation in the area from a separate study (attached). Please let me know if this is sufficient, or please provide additional data if available.

<https://www.google.com/maps/place/39+Queens+Quay+E,+Toronto,+ON+M5A+1B6/@43.6415864,-79.3739841,17.25z/data=!4m5!3m4!1s0x89d4cb291d4c93a9:0xa508505d01cca90e!8m2!3d43.6416066!4d-79.3719866>

Thanks,

Adam Doiron, EIT
Project Consultant

HGC Engineering [NOISE](#) | [VIBRATION](#) | [ACOUSTICS](#)

Howe Gastmeier Chapnik Limited

2000 Argentia Road, Plaza One, Suite 203, Mississauga, Ontario, Canada L5N 1P7

t: 905.826.4044 x 234 e: adoiron@hgcengineering.com

Visit our website – www.hgcengineering.com Follow Us – [LinkedIn](#) | [Twitter](#) | [YouTube](#)

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Ian Bonsma, P.Eng.
HGC Engineering Ltd.
2000 Argentia Road, Plaza One, Suite 203
Mississauga, ON L5N 1P7

Dear Ian:

Project No: 5000-059-09-68

Regarding: Train Traffic Data – Kingston Subdivision in the vicinity of Parliament Street in Toronto

N:\BuildingsDivision\Cityzen\Cityzen Pier 27\Phase 3 (prev Phase 4)\01-Reports\04 - NVIS 2020 (under title Phase 4) _issued in draft\Traffic Data

The following is provided in response to your September 3rd, 2010 request for information regarding rail traffic in the vicinity of Parliament Street in Toronto, Ontario at approximately Mile 332.85 on CN's Kingston Subdivision.

Typical daily traffic volumes are recorded below. However, traffic volumes may fluctuate due to overall economic conditions, varying traffic demands, weather conditions, track maintenance programs, statutory holidays and traffic detours that when required may be heavy although temporary.

Typical daily traffic volumes on the Kingston Subdivision in the vicinity of Parliament Street are as follows:

***Maximum train speed is given in Miles per Hour**

Eastbound	0700 - 2300			
Type of Train	Volumes	Max. Consist	Max. Speed	Max. Power
Freight	2	140	15	4
Way Freight	2	25	15	2
Passenger	10	15	30	2

Westbound	0700 - 2300			
Type of Train	Volumes	Max. Consist	Max. Speed	Max. Power
Freight	5	140	15	4
Way Freight	2	25	15	2
Passenger	12	15	30	2

Eastbound	2300 - 0700			
Type of Train	Volumes	Max. Consist	Max. Speed	Max. Power
Freight	4	140	15	4
Way Freight	0	25	15	2
Passenger	0	15	30	2

Westbound	2300 - 0700			
Type of Train	Volumes	Max. Consist	Max. Speed	Max. Power
Freight	0	140	15	4
Way Freight	1	25	15	2
Passenger	1	15	30	2

The volumes recorded reflect Eastbound and Westbound freight, way freight and passenger operations on the Kingston Subdivision approximately at Mile 332.85. Not included in the above data are GO Transit commuter trains running East and West on the Kingston Subdivision. For information regarding projected commuter operations, Mr. Adam Snow, Transportation Planner, should be contacted directly through Metrolinx offices at 20 Bay Street, Suite 600, Toronto, Ontario M5J 2W3, Fax 416-869-1563 and phone 416-869-3600.

Except where anti-whistling bylaws are in effect, engine-warning whistles and bells are normally sounded at all at-grade crossings. There are no at-grade crossings in the immediate vicinity of your study area. Please note that engine warning whistles may be sounded in cases of emergency, as a safety and or warning precaution at station locations and pedestrian crossings and occasionally for operating requirements.

With respect to equipment restrictions, the gross weight of the heaviest permissible car is 286,000 lbs. All the Kingston Subdivision tracks are constructed of continuously welded rail throughout the study area. The presence of numerous nearby switches will exacerbate the noise and vibration caused by train movements.

The Canadian National Railway continues to be strongly opposed to locating developments near railway facilities and rights-of-way due to potential safety and environmental conflicts. Development adjacent to the Railway Right-of-Way is not appropriate without sound impact mitigation measures to reduce the incompatibility. For confirmation of the applicable rail noise, vibration and safety standards, Mr. Nick Coleman, Canadian National Railway Properties at 905-760-5007 should be contacted directly.

We trust the above information will satisfy your current request.

Sincerely,
AECOM Canada Ltd.



Warren D'Andrade
Warren.dandrade@aecom.com

cc: Nick Coleman, CN – email
Adam Snow – GO Transit – email