Bruynson Condominium-Townhouse Development

296 George Street

Town of Cobourg Ontario

Traffic Brief Report

Prepared by:
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Prepared for: R W Bruynson Inc
Architect-Consulting Engineer
July, 2020

July 6, 2020

R. W. Bruynson Inc.
Architect – Consulting Engineer
6 Hillside Drive
Hampton, ON L0B 1J0

Attn: R. W. Bruynson

Dear Sir:

RE: Traffic Study Brief for The Proposed Condominium-Townhouse Development to be located at 296 George Street, in the Town of Cobourg

Tranplan Associates is pleased to present the results of the traffic study carried out to assess the potential traffic impacts of the proposed *Bruynson Condominium-Townhouse Development.* The new development will be located at 296 George Street in the Town of Cobourg, Ontario. The new residences will be constructed on a vacant lot adjacent to the established core commercial area of the Town. The traffic study analyses have been based on a total of 5 townhouses (condominiums) and 15 apartments (condominiums). The apartments will be located in a 3 story building. Future traffic volumes generated by this development can be accommodated in the existing George Street corridor. Drivers entering/exiting George Street from the new development will face a minimum of delay.

The new site entrance with single in/outbound lanes will provide sufficient site access capacity. No auxiliary turning lane or right turn taper will be required on George Street at the new site entrance. The existing adjacent intersections on George Street will support future site and background traffic.

Tranplan Associates is pleased to have the opportunity to work with your study team on this project. If you should require any further information on the study analyses or reporting, please contact me at your convenience

Yours truly,

William Copeland, P.Eng.
Principal
Tranplan Associates

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1. INTRODUCTION

1.1 Background

Tranplan Associates is pleased to present the results of a traffic study to determine the impact of the new *Bruynson Condominium-Townhouse Development* to be located in the central core the Cobourg (see *Exhibit 1 - Key Map* following report text). The development will be located on a vacant "L"-shaped lot on the east side of George Street just north of the King Street. The George Street corridor, with the three study intersections and nearby land uses are illustrated in *Exhibit 2 - Site Context.*

The traffic study analyses have been based on a residential development that will consist of 5 townhouses (condominiums) and 15 apartment units (condominiums). The apartments will be located in a 3 story building. The proposed layout of the development and its access to George Street are illustrated in *Exhibit 3 – Preliminary Concept Plan*. The internal site driveway, as illustrated in *Exhibit 3,* will access George Street. The George Street corridor will be the principal north/south route to the Cobourg road network. Three adjacent streets, Buck Street, Orange Street and Covert Street will provide east/west access (see *Exhibit 2*).

This traffic study has been requested by the Town of Cobourg as part of the planning approval process for the proposed development. Discussions were held with the study team and the Town to establish the scope of the traffic study. Tranplan Associates staff have completed three site visits to collect current peak hour traffic counts, observe current traffic operations, measure existing road cross-sections, review adjacent land uses, and measure site entrance sight lines.

Traffic analyses completed for this study include intersection capacity analyses of the study intersections illustrated in *Exhibit 2* as well as the future site entrance to George Street. Additional analyses included auxiliary lane warrant evaluations to assess the need for auxiliary turning lanes on George Street at the new site entrance. The analyses were based on future AM and PM peak hour volumes for a 5 year planning period to 2025. The total traffic volumes used in the analyses included traffic generated by full buildout of the new residential development combined with growth in background traffic along the George Street corridor.

1.2 Principal Findings

The principal findings derived from the study analyses include the following:

- The present study road network operates at good Levels of Service (LoS)[1] during weekday peak hour periods with considerable residual capacity for future growth in traffic.
- During future 2025 total traffic peak hour conditions, all traffic movements at the study intersections and the new site entrance are forecasted to operate at the

[1] See Technical Appendix – Intersection Capacity Analysis for definitions of Levels of Service.

boundary of LoS “A/B”. This is considered a very good LoS for peak hour traffic conditions. Drivers accessing George Street from the new development will face little delay.

- No auxiliary turning lanes will be required on George Street at the new site entrance to support future 2025 total weekday peak hour traffic volumes.
- The existing intersection geometrics at the three study intersections will accommodate future 2025 total peak hour volumes.
- The new residential development will be served by *Cobourg Public Transit.* The residents will have access to routes on three adjacent streets*.* This will provide the new *condominium* residents with direct active transportation links to commercial and retail destinations in the Cobourg Community. A copy of the current *Cobourg Public Transit* routes is included in the *Technical Appendix – Background Data.*
- Additional active transportation links include:
  - A sidewalk network linking the site to adjacent retail and commercial facilities along the King Street corridor as well as nearby residential areas.
  - Town cycling routes.
  - A local taxi service.
  - GO Transit links that will provide regional access.
  - VIA rail for additional regional access.

In summary, the existing study roads and intersections will accommodate new traffic that will be generated by *Bruynson Condominium-Townhouse Development*. The following sections of the Study Report contain the documentation and details of the analyses to support the principal findings of the study.

2. EXISTING CONDITIONS

This Section describes the roadway network, traffic volumes, operational analysis results and other notable characteristics under the baseline conditions.

2.1 The Study Site

The *Bruynson Condominium-Townhouse Development* will be located in the "*George Street Heritage Conservation District*" of the Town of Cobourg. The study site is now a vacant "L"-shaped lot fronting on George Street with side frontage on Buck Street as illustrated in *Exhibit 2*. The proposed condominium development will contain 5 townhouses and 15 apartments. The apartments will be housed in a 3 story building. Layout of the site development and main access driveway to George Street are illustrated in *Exhibit 3*.

2.2 Adjacent Land Use

The study site is located in the established core area of the Town. It lies two blocks north of King Street, the main commercial/retail corridor in the old Town. Surrounding development is a mix of boutique retail, commercial offices, a restaurant, apartments and older residential homes. A large parking area along Covert Street south of the site provides for longer term parking for development along the north side of King Street. This mix of uses are characteristic of established core areas in similar communities in this part of Ontario. The layout of the surrounding uses and road infrastructure are illustrated in *Exhibit 2*.

2.3 Access to the Study Site

All streets and intersections included in the study road are under the jurisdiction of the Town of Cobourg. The following sections provide details of the road infrastructure that has been considered in the study analyses.

2.3.1 George Street

George Street will provide direct access to the study site. It presently functions as a north/south collector road. It accommodates traffic travelling to/from King Street to the northern part of the Town. As a collector road it also provides access to a range of commercial, retail and residential development along the corridor.

In the vicinity of the study site it has an urban curb and gutter cross-section with a 6.8 m asphalt platform that accommodates two-way traffic. Parking is prohibited on both sides of the street. It has sidewalks on each side to accommodate pedestrian traffic. There is no posted speed limit in the vicinity of the study site. *Exhibit 4* illustrates this section of the George Street corridor.

2.3.2 Covert Street

Covert Street is one-way street functioning primarily as a "local" street providing access to a large parking area serving development along the King Street corridor. Covert Street runs from Division Street west to George Street. In the vicinity of

George Street it has a paved cross-section with a 6 m asphalt platform that accommodates one-way westbound traffic. It has a sidewalk on the north side. The road platform has open asphalt ditching. It has no posted speed limit. Parking is prohibited on both sides. *Exhibit 4* illustrates this section of Covert Street

2.3.3 Orange Street

Orange Street is one-way street functioning primarily as a "local" street providing access to parking areas serving development along the King Street corridor as well as access to residential driveways along the street. Orange Street runs from George Street west to Spring Street. In the vicinity of George Street it has an urban curb and gutter cross-section with a 6 m asphalt platform that accommodates one-way westbound traffic. It has sidewalks on both sides. It has no posted speed limit. It has a limited number of parking stalls on the south side. Parking is prohibited on the remainder of the street. *Exhibit 5* illustrates this section of Orange Street

2.3.4 Buck Street

Buck Street is one-way street functioning as a "local" street providing access to its commercial and residential development. Buck Street runs from George Street east to Division Street. In the vicinity of George Street it has an urban curb and gutter cross-section with a 5 m asphalt platform that accommodates one-way eastbound traffic. It has a concrete sidewalk on the north side and an asphalt "maintenance strip" along the south side. It has no posted speed limit. Parking is prohibited on both sides of the street. *Exhibit 5* illustrates this section of Buck Street

2.3.5 The Study Intersections

The study road network includes three intersections as illustrated in *Exhibit 2*. The intersection are:

- *Covert Street and George Street* – Traffic flows one-way westbound to access George Street. There is STOP-control on the Covert Street approach. This controls the westbound approach volumes entering the George Street corridor.
- *Orange Street and George Street* – Traffic flows one-way westbound from George Street to Spring Street to the west. There are "Permitted" northbound left turns from George Street to Orange Street. All other intersection movements are free flow.
- *Buck Street and George Street* – Traffic flows one-way eastbound from George Street to Division Street. There are "Permitted" southbound left turns to Buck Street. All other intersection movements are free flow. .

All three intersections have single lane approaches. There are no auxiliary turning lanes or right turn treatments at these intersections.

2.4 Current Traffic Data

With current "Lockdown" conditions, traffic volumes have been reduced in most of the Cobourg road corridors. A forecasting process was developed in consultation with Town staff to develop representative 2020 weekday peak period "normal" traffic volumes. Weekday AM and PM peak period traffic counts were collected by Tranplan Associates staff at the three study intersections. The counts were carried out in late May, 2020 following the initial opening of businesses in Cobourg. The Town was able to supply additional background traffic data for adjacent road corridors. Based on this data, the May, 2020 counts were expanded to representative weekday peak hour volumes. A report on the data collection and study process was submitted to the Town for review and comment. A copy of this report is included in the *Technical Appendix – 2020 Forecast Peak Hour Volumes*. Following this, it was agreed that expanding the observed May counts by 50% would provide acceptable 2020 peak hour volumes. The resulting 2020 "normal" peak hour volumes are illustrated in *Exhibit 6 – 2020 Normal Peak Hour Volumes*. These volumes were subsequently applied to the study analyses.

2.5 Current Traffic Operations

Traffic operations at the three study intersections were observed during the site field visits and traffic count program. No particular operational issues were observed at these times.

Highway Capacity Manual (HCM) intersection capacity analyses based on the 2020 volumes (see *Exhibit 6*) were carried for the Covert/George intersection. The analyses determined that during current peak hour periods all movements at the intersection operate at the boundary of Level of Service (LoS) "A/B". This is a very good LoS for peak hour conditions. Drivers accessing George Street from Covert Street will experience acceptable delay. There is considerable residual intersection capacity to accommodate future growth in background traffic. Detailed printouts of the 2020 capacity analyses for this intersection are included in the *Technical Appendix – Intersection Capacity Analyses*.

All traffic entering Orange Street or Buck Street from George Street essentially operates under free-flow conditions. Normal HCM capacity analyses cannot be applied to these intersections.

2.6 Active Transportation Links

Residents of the new *Bruynson Condominium-Townhouse Development* will be served by *Cobourg Public Transit*. They will have access to routes on Division Street, King Street and Spring Street. A copy of the Cobourg Transit Route Map is included for reference in the *Technical Appendix – Background Data*. The map illustrates the connectivity that these transit links will provide to the new condominium residents.

The study site is also well served by a local sidewalk network. Given the location and nature of this residential development, it is likely that future residents will wish to take advantage of their close proximity to the wide range of services and facilities in the immediate area. This sidewalk network should encourage considerable pedestrian travel to/from these local destinations.

The Town also has a number of cycling routes. Details of the routes are available on the Town's website. These cycling routes provide connectivity to the more extended cycling routes through Northumberland County.

Regional transit links are also available. They include:

- GO Transit service
- Via Rail

This range of active transportation links and services will provide the new condominium residents with a full range of options for none-auto travel.

3. THE PROPOSED DEVELOPMENT

This Section describes the proposed changes to the subject site and the development of the site generated traffic.

3.1 Trip Generation Forecasts

The *Bruynson Condominium-Townhouse Development* will contain 5 townhouses and 15 apartments in a 3 story building. The layout of the proposed development is illustrated in *Exhibit 3.* Site trip generation forecasts were computed based on rates taken from the current Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th ed.). The "Townhouse" classification that was included in earlier versions of the Manual is no longer included in the 10th edition. As a worst case, the land use applied to this use was *Single-Family Detached Housing* (LU 210). The trip generation category applied to the 15 apartments was *Multi-family Housing (Low Rise)* (LU 220). *Table 1* following, summarizes the site trip generation forecasts for the development.

Table 1: Forecast Site Trip Generation (vph)

		AM Peak Hour			PM Peak Hour		
Land Use	**Units**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Townhouses	5	1	3	4	3	2	5
Apartments	15	2	5	7	5	3	8
Total	**20**	**3**	**8**	**11**	**8**	**5**	**13**

The full condominium development is forecasted to generate a total of 11 new vehicle trips during the weekday AM peak hour and 13 new vehicle trips during the weekday PM peak hour. The ITE trip generation rate are based on a representative North American rates for each of these land uses. However, given the location of the new development and its close proximity to the traditional core and commercial areas of Cobourg, it is likely that these rates overstate the future site trip generation. As a worse case, the ITE forecasted trip generation with no trip volume reductions for "linked trips", "diverted trips" or "pass-by" trips was applied to the study analyses.

It is noted that the forecasted future traffic volumes during the PM peak hour, on the average, will be about 1 vehicle every 5 minutes that will be added to the George Street corridor. This will have little impact on present/future traffic operations on George Street or the adjacent intersections.

3.2 Site Trip Distribution

The site trip distribution was developed from the observed distribution of traffic travelling along the George Street corridor and the three study intersections. The site traffic can arrive/depart the immediate study area via five "gateways":

- George Street North
- George Street South
- Covert Street from the east
- Orange Street to the west
- Buck Street to east

Separate trip distributions were developed for the AM and PM peak hour periods. Because of the adjacent one-way streets these distributions were further broken out by the inbound and outbound directions. The resulting trip distributions applied to the traffic analyses and assignments are summarized in *Table 2 – Site trip Distribution* following below.

Table 2: Site Trip Distribution

	AM Peak Hour		PM Peak Hour	
Gateway	**Inbound**	**Outbound**	**Inbound**	**Outbound**
George St North	55%	50%	45%	45%
Buck Street to east	0%	5%	0%	5%
Orange St to west	0%	20%	0%	15%
Covert St from east	15%	0%	25%	0%
George St South	30%	25%	30%	35%
Total	***100%***	***100%***	***100%***	***100%***

The 0% entries in the table are a result of the one-way travel corridors to/from George Street. Also noted in *Table 2* are the differences in the distribution of travel between the AM and PM peak hour periods. Some of this can be attributed to the different make-up of trip purposes in each of the peak hour periods. The AM peak hour is comprised mostly of work trips and school trips. However, there is a greater mix of other trip purposes during the PM peak hour.

4. FUTURE CONDITIONS

This Section summarizes the assumptions used to develop future year traffic volumes, the operational analysis results and associated impacts to the transportation infrastructure.

4.1 Future Background Traffic

Future background traffic forecasts were developed for a 5 year planning horizon from 2020 to 2025. It is assumed that full site build out will occur over the next 1-2 years. The 5 year planning horizon will allow for planning approvals, build out of the study site and time for additional growth in background traffic. A 2% annual traffic growth rate was applied to the 2020 background traffic forecasts to produce the 2025 background peak hour volumes. This rate of growth likely overstates the historic growth rate in this part of the established core area. However, this rate is generally considered appropriate for use in these traffic studies. The 2% per year (compounded) traffic growth factor was applied to the 2020 volumes as illustrated in *Exhibit 6* to forecast 2025 weekday AM and PM background peak hour volumes in the George Street corridor.

4.2 Future Total Traffic

The 2025 total weekday AM and PM peak hour volumes for the study road network were computed by adding the new condominium traffic to the 2025 background traffic. The new site traffic was distributed to the study road network based on the assumptions described in *Section 3.2*. The resulting total peak hour volumes are illustrated in *Exhibit 7 – 2025 Total Peak Hour Volumes*. The site traffic volumes are also illustrated in this exhibit.

4.3 Site Traffic Impacts

Detailed intersection capacity analyses were carried out to assess the impact of future site traffic on the Covert/George intersection and the new site entrance intersection with George Street. The Orange and Buck intersections with George Street have essentially free-flow movements with no STOP-control on any of the movements. No capacity analyses could be done for these two intersections. The capacity analyses that were done applied current 2010 HCM intersection capacity analyses procedures as contained in *Trafficware's Synchro 10* software. The analyses were based on the volumes illustrated in Exhibits 6 & 7. The results are contained in *Table 3* following.

Table 3: Summary - Intersection Capacity Analyses

Intersection of Covert St and George St (Unsignalized-TWSC)						
	AM Peak Hour – Critical Movement			**PM Peak Hour – Critical Movement**		
	LoS (Delay)	**Vol/Cap**	**Queue[A]**	**LoS (Delay)**	**Vol/Cap**	**Queue[A]**
2020 Design Hr Vol	WB L-R "A/B" (9.0s)	0.05	0.2 veh	WB L-R "A/B" (9.5s)	0.13	0.4 veh
2025 Backgrd Vol	WB L-R "A/B" (9.1s)	0.06	0.2 veh	WB L-R "A/B" (9.7s)	0.14	0.5 veh
2025 Total Vol	WB L-R "A/B" (9.1s)	0.06	0.2 veh	WB L-R: "A/B" (9.7s)	0.15	0.5 veh

A – Queue is the 95th percentile vehicle queue length measured in vehicles.

Table 3 Continued

Site Entrance Intersection with George St (Unsignalized-TWSC)						
	AM Peak Hour – Critical Movement			PM Peak Hour – Critical Movement		
	LoS (Delay)	Vol/Cap	Queue[A]	LoS (Delay)	Vol/Cap	Queue[A]
2025 Total Peak Hr	WB L-R "A/B" (9.3s)	0.01	0 veh	SB LTR: "A/B" (9.9s)	0.01	0 veh

A – Queue is the 95th percentile vehicle queue length measured in vehicles.

During future 2025 Total weekday peak hour conditions, critical turning movements at the study intersections are forecasted to operate at the boundary of LoS "A/B". This is considered to be a very good LoS for week day peak hour periods. There will be considerable residual capacity at these intersections. The maximum volume/capacity (v/c) ratio is forecast to be 0.15 or 15% of available capacity. In reviewing *Table 3,* it is noted that the combined growth in background traffic over 5 years plus new site traffic will increase average driver delay by less than 1.0 second during the PM peak hour. New traffic from the condominium development will experience little delay when accessing George Street. Based on the low v/c ratios, there will be considerable residual capacity in the George Street traffic stream to accommodate traffic from the new residential development.

Forecasted site traffic will have little impact on future traffic operations in the George Street corridor. No improvements will be required at any of the study intersections to support future site and background traffic. Detailed printouts of the capacity analyses for two of the study intersections for 2025 peak hour conditions are included in the *Technical Appendix - Intersection Capacity Analyses*.

As noted, the capacity analyses software does not calculate LoS or delay for free-flow intersections. The forecasted 2025 PM peak hour delay for left turns into the study site is 7.6 seconds (LoS "A"). It is reasonable to assume that delay to left turns from George Street onto Orange Street or Buck Street will likely be little more than the delay to southbound left turns into the study site.

4.4 Auxiliary Lane Warrant Analyses

A northbound right turn lane warrant analysis was carried out for the new site entrance to George Street based on the 2025 total peak hour volumes. Current TAC design guide lines and MTO design standards do not provide a specific warrant procedure for assessing the need for right turn taper/lanes. The analysis applied the current *Virginia Department of Transportation* (VDOT) right turn lane warrant procedure. This right turn lane warrant methodology has been used in a number of other traffic studies in Northumberland County and adjacent municipalities and found acceptable. The 2025 right-turning volumes are forecast to be less than 20 vph. Therefore, there will be no warrant for a northbound right turn taper or lane at this intersection. The right turn radius (curb "rounding") on the entrance to George Street constructed to Town of Cobourg/TAC standards will accommodate right turns into the study site. A copy of the VDOT calculation sheet/nomograph used for this right turn warrant analysis is provided in the *Technical Appendix – Auxiliary Lane Warrant Analyses*.

4.5 The Future Site Entrance

The location of the planned site entrance to George Street is illustrated in *Exhibit 2*. The future sight lines at the proposed site entrance were field checked during one of the site visits. There is clear sight distance north along George Street to the Buck Street intersection and beyond. To the south there is clear visibility to the Orange Street and Covert Street intersections. Based on the 95th percentile queue length data from the *Synchro* analyses, there will be 0 vehicles in the southbound left turn queue on George Street at the site entrance. This means that there will be no queue "spillback" to the Buck Street intersection.

There will be about 18 m of "corner clearance" from the north side of the entrance roadway to the south side of Buck Street. This exceeds the current TAC standard[2] of 15 m for this type of "corner clearance". A standard site entrance for a condominium access road designed to Town of Cobourg standards will provide acceptable access to the study site.

4.6 Active Transportation Links

The new residents of the proposed *Bruynson Townhouse – Condominum Development* will have good transit access to other areas in the Cobourg community. The study site is located close to *Cobourg Transit* routes located on King Street, Spring Street and Division Street. A range of active transportation links including a well-connected sidewalk network and a number of cycling routes will also be available to the new residents. In addition, regional transit access will be provided by GO Transit and Via Rail.

In summary, the site is well served by existing active transportation links. These links should serve to encourage the choice of non-auto transportation facilities for travel in the community.

[2] See Fig 8.8.2, pg. 44, Chapt. 8 Geometric Design Guide for Canadian Roads, TAC pub, June 2017

5. CONCLUSIONS AND RECOMMENDATIONS

This Section summarizes the salient findings of the analyses and identifies any necessary changes to the transportation infrastructure.

5.1 Conclusions

The *Bruynson Condominium – Townhouse Development* to be constructed at 296 George Street will provide 20 new residential units in the established core of the Town. In support of plans for this development, the traffic impact analyses described in this report provide a detailed examination of the anticipated impacts of future background and site-generated traffic. The following conclusions have been drawn from the study field observations, background data sources and traffic analyses. They are as follows:

- The present study road network operates at a good LoS during weekday peak hour periods. There is considerable residual capacity for future growth in traffic.
- During future 2025 Total peak hour conditions, all traffic movements at the study intersections are forecasted to operate at the boundary of Level of Service (LoS) "A/B" or better (see *Table 3*). This is considered a good LoS for peak hour traffic conditions. Drivers accessing the George Street corridor will experience a minimum of delay.
- During the 2025 PM peak hour, the future condominium traffic will average 1 new trip in the George Street corridor about every 5 - 6 minutes. This will have little impact on the future George Street traffic operations.
- The auxiliary lane warrant analysis for the future site entrance has determined that no future auxiliary lanes or right turn tapers will be required on George Street to support future access to the study site.
- There is acceptable site distance at the site entrance intersection with George Street.
- Existing *Cobourg Public Transit* service along adjacent streets will provide good transit access for the new development. This transit service is supported with a well-connected sidewalk network. These facilities will encourage the use of non-auto facilities to access services and destinations in the community.

5.2 Recommendations

The following recommendations have been developed from the study analyses and conclusions:

- A new site entrance providing access to George Street should be constructed to current Town of Cobourg standards for a condominium road accessing a minor collector road.
- The radii (curb “rounding”) at the site entrance to George Street should accommodate all service vehicles entering the condominium site. This should include emergency service vehicles, municipal service vehicles and larger passenger vehicles.

- The internal condominium roadway as illustrated in *Exhibit 3* should be designed to meet current Town of Cobourg standards for such roadways.

Study analyses have shown that the existing study road network has the capacity to accept future site traffic from the proposed condominium development. New site traffic generated by this development will have an acceptable impact on adjacent roads and intersections. No new road infrastructure will be required to support traffic generated by the *Bruynson Townhouse-Condominium Development*.

REPORT EXHIBITS

Exhibit 1
Key Map

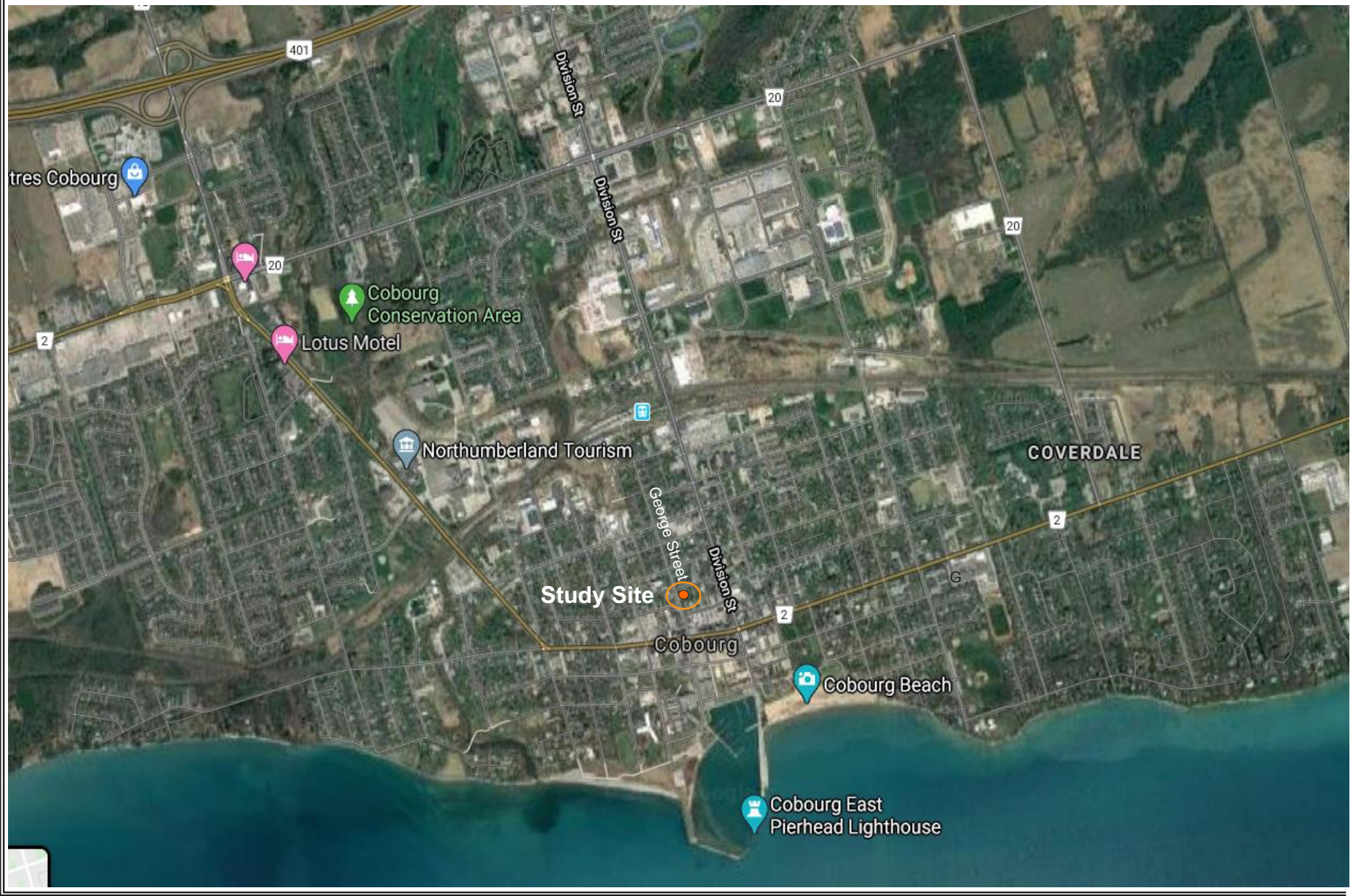


Exhibit 2
Site Context

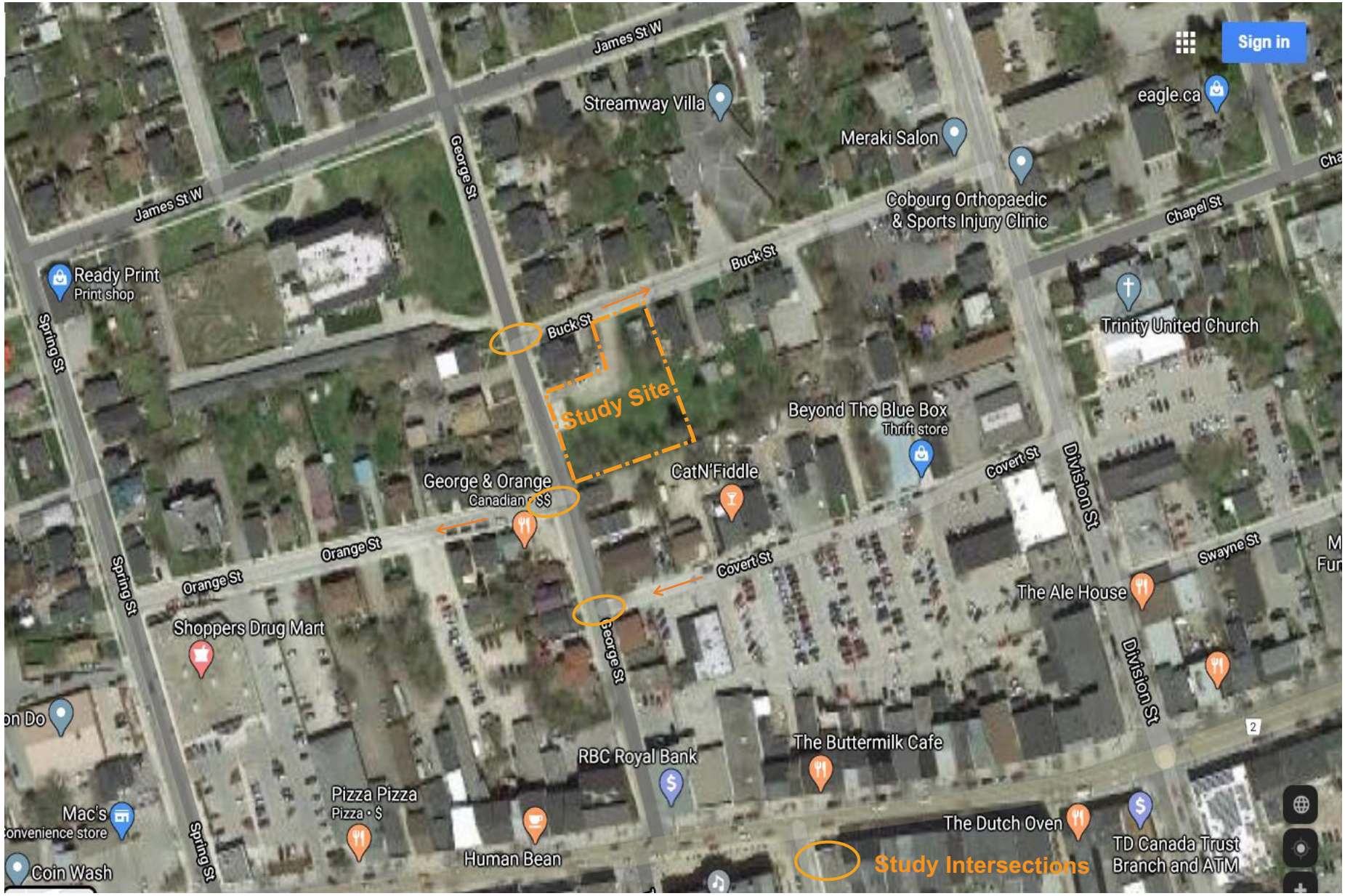
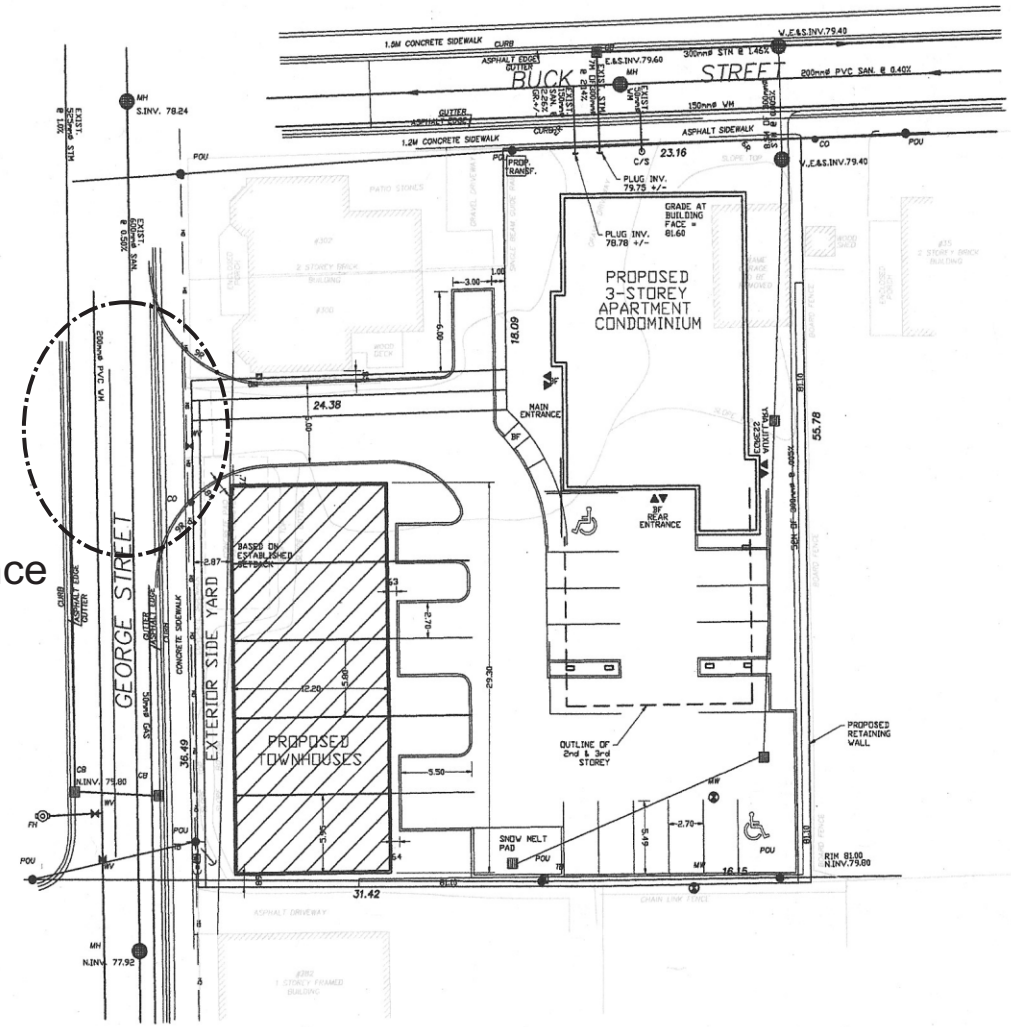


Exhibit 3
Preliminary Concept Plan

Site Entrance



KEY PLAN – NOT TO SCALE

DATE	NO.	ISSUE	INIT.
NOV.22.'19	1	FOR TOWN PRE-CONSULTATION	RWB

TOPOGRAPHIC DETAIL OF
296 GEORGE STREET
TOWN OF COBOURG

SCALE 1 : 250 METRES

0 1 2 3 4 5 10 20

CAUTION
THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK.

COORDINATES
COORDINATE VALUES AND DIGITAL FILE ARE IN GRID SYSTEM, UTM ZONE 17N, NAD83(CSRS)(2010).
COMBINED SCALE FACTOR = 1.000228

BOUNDARY NOTE
BOUNDARY INFORMATION SHOWN HEREON IS IN ACCORDANCE WITH PLAN OF SURVEY BY IVAN B. WALLACE O.L.S. LTD., DATED APRIL 30, 2019 (PROJECT NUMBER 4-5094)

ELEVATIONS
ELEVATIONS ARE GEODETIC AND REFERRED TO TOWN OF COBURG BENCHMARK 0011910U17 AND HAVING A GEODETIC ELEVATION OF 80.14 METRES.

LEGEND

DSE	DENOTES DOOR SILL ELEVATION
GM	DENOTES GAS METER
WV	DENOTES WATER VALVE/KEY
AN	DENOTES ANCHOR POINT
POU	DENOTES UTILITY POLE
-OH-	DENOTES OVERHEAD UTILITY WIRES
MH	DENOTES MAINTENANCE HOLE ELEVATION AT CENTRE
CB	DENOTES CATCH BASIN ELEVATION AT TOP CENTRE
TB	DENOTES TERMINAL BOX
MW	DENOTES MONITORING WELL ELEVATION AT GROUND
	DENOTES CONIFEROUS TREE W/TRUNK DIAMETER
	DENOTES DECIDUOUS TREE W/TRUNK DIAMETER
+123.45	DENOTES SPOT ELEVATION
	DENOTES CONIFEROUS SAPLING

CONTOURS
CONTOURS SHOWN HEREON ARE DRAWN AT 0.20 METRE INTERVALS.

ZONING AND SITE DATA
OFFICIAL PLAN DESIGNATION - MAIN CENTRAL AREA
ZONING DESIGNATION - MAIN CENTRAL COMMERCIAL - MC14 & MCSP80(B)
REQ'D CENTERLINE SETBACK - 7.5M
PARKING REQUIRED - APARTMENT 1.25/UNIT (2.7x5.5) - 50%
TOWNHOUSE 1.5 /UNIT (2.7x5.5) - 50%
BARRIER FREE (4x24m²) - 1 req'd
AISLE WIDTH - 6M (two way) - 4.5M (one way)
NO PARKING IN FRONT OR EXTERIOR SIDE YARD AND 10M FROM STREET LINE
RESIDENTIAL DRIVEWAY WIDTH 6.0M
FLOOR SPACE INDEX - 2.0
FRONT YARD SETBACK - HISTORICALLY ESTABLISHED BUILDING LINE
REAR YARD SETBACK - 6M
SIDE YARD SETBACK - 0M
3 STOREY MAX. HEIGHT (ASSUMED 9.95M ABOVE EAST PROPERTY LINE)
(ASSUMED 8.7M ABOVE WEST PROPERTY LINE)
LOT AREA - 2,185 SQ.M.

PROPOSED USEAGE PART 9 O.B.C.
5 CONDOMINIUM TOWNHOUSE UNITS + 15 UNIT CONDOMINIUM APARTMENT ONE CONDOMINIUM ENTITY WITH SHARED COMMON ELEMENTS
HEIGHT = 3 STOREYS + BASEMENT
BUILDING AREA = 484 M²
1 PARKING SPACE PER UNIT = 1 BF
FRONT YARD SETBACK - 3.57M
EXTERIOR SIDEYARD SETBACK - 2.67M
INTERIOR SIDEYARD SETBACK - 1/2 HEIGHT ABOVE FRONT GRADE OF HABITABLE AREAS WITH WINDOWS
MAX. PROJECTION OF FRONT PORCH 2.27M
RESIDENTIAL DRIVEWAY WIDTH 6.0M
FLOOR SPACE INDEX - 1.31
FRONT YARD SETBACK - HISTORICALLY ESTABLISHED BUILDING LINE
SIDE YARD SETBACK - 0M

IBW SURVEYORS
IBWSURVEYORS.COM | 1.800.667.0896
FILE NAME: 4-5094-TopoDetail.dwg
PLOT DATE: APRIL 29, 2019

DATE	NO.	REVISION	BY

ONTARIO ASSOCIATION OF ARCHITECTS — R.W. BRUYNSON

.DIMENSIONS MUST NOT BE SCALED
.ALL MEASUREMENTS MUST BE CHECKED AND VERIFIED AND ALL ERRORS OR OMISSIONS SHALL BE REPORTED TO THE CONSULTANT PRIOR TO PROCEEDING WITH THE WORK
.ALL PRINTS OF PLANS AND SPECIFICATIONS ARE THE PROPERTY OF THE CONSULTANTS AND MUST BE RETURNED AT COMPLETION OF THE WORK
.THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL IT IS SIGNED BY THE CONSULTANT OF RECORD

DATE _____

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PROJECT
Proposed Apartment & Townhouse Development
296 George Street — Cobourg, Ontario

DRAWING
PRELIMINARY CONCEPT

DATE	Sept.'19	PROJECT NO.	
SCALE	1 : 150		19029
DESIGNED BY	RWB	DWG.	
DRAWN BY	RWB	NO.	
CHECKED BY	RWB	PRELIM.	#1

Exhibit 4
Road Corridors 1

The George Street Corridor looking north
The future site entrance is on the right

The Covert Street Corridor looking east
From George Street to Division Street

Exhibit 5
Road Corridors 2

**The Orange Street Corridor looking west
From George Street to Spring Street**

**The Buck Street Corridor looking east
From George Street to Division Street**

Exhibit 6
2020 Normal Peak Hour Volumes

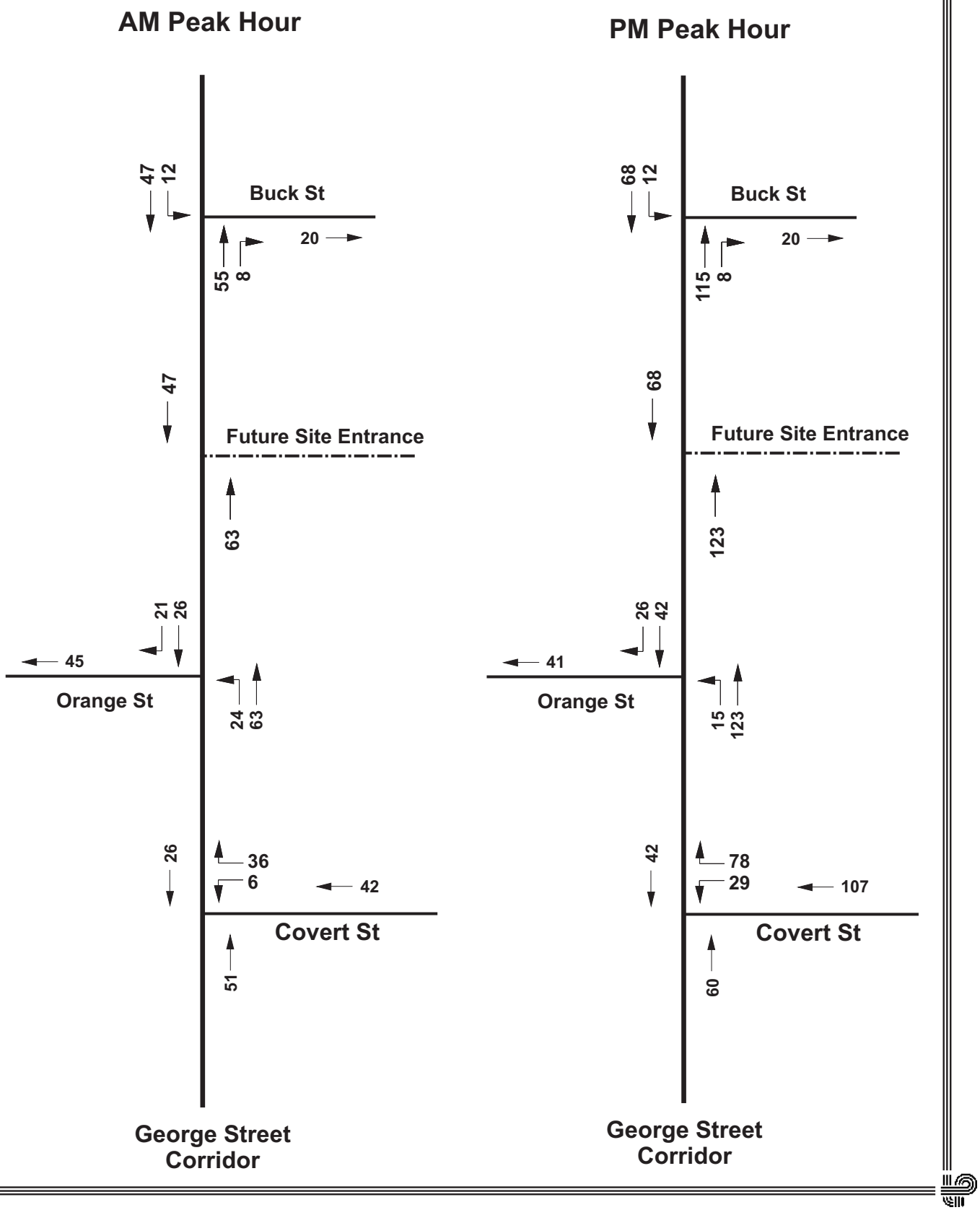
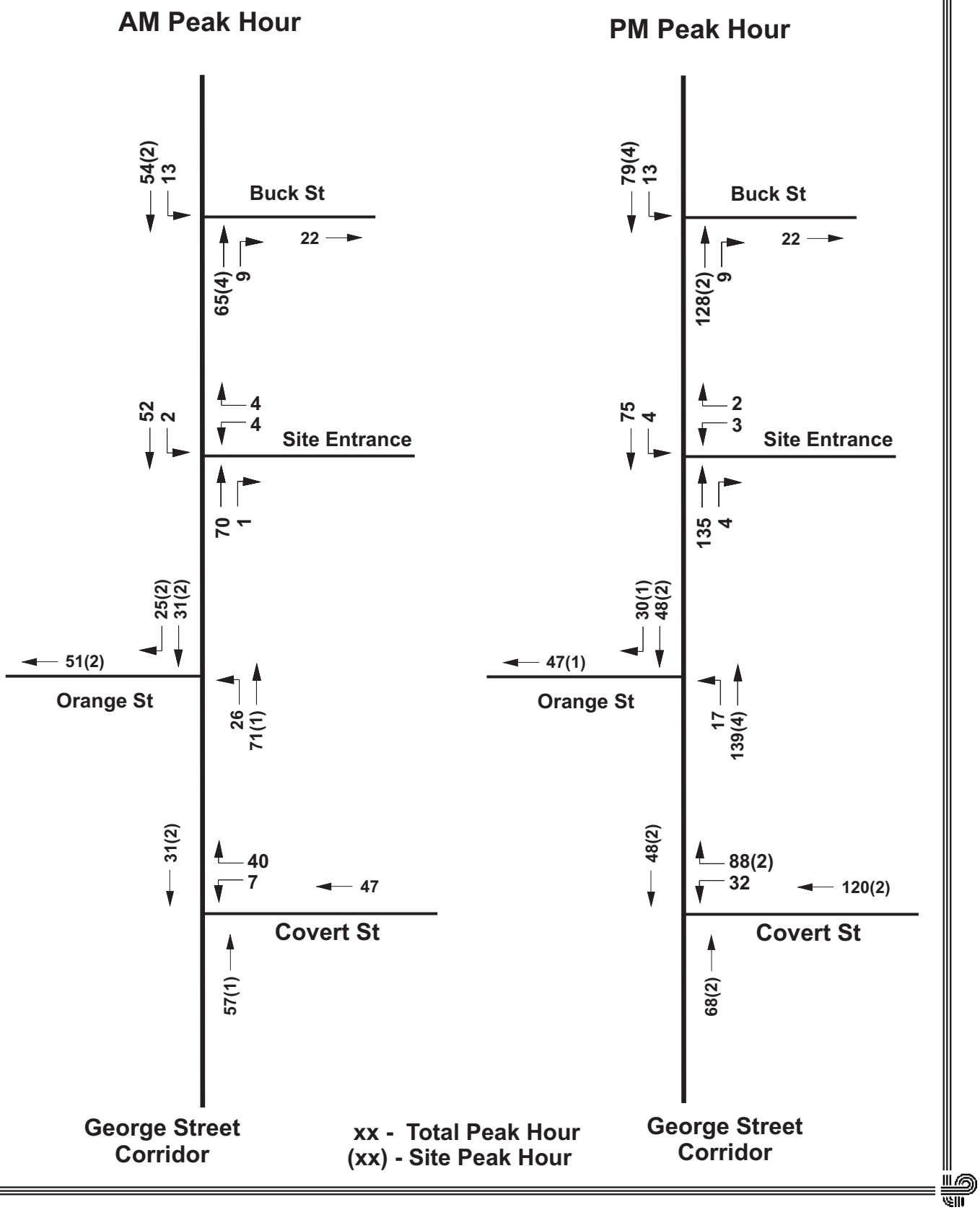


Exhibit 7
2025 Total Peak Hour Volumes



TECHNICAL APPENDIX

Intersection Capacity Analyses

DEFINITION OF LEVELS OF SERVICE
Automobile Mode

UNSIGNALIZED INTERSECTIONS

Analysis of the Level of Service for unsignalized intersections is based on the ***Highway Capacity Manual*** *(HCM 2010)* procedures using current software for unsignalized intersections. The Level of Service for intersections is based on *Control Delay*. At two way stop controlled intersections (TWSC), *Control Delay* is the total elapsed time from a vehicle joining the queue until its departure from the stopped position at the head of the queue. The *Control Delay* includes the time required to decelerate to a stop and to accelerate to the free-flow speed.

The analysis of individual movements at TWSC intersections can also include the estimate of the ratio of volume or demand to available capacity for the movements. This is commonly know as the (v/c) ratio. The v/c ratio provides some indication of how well these individual intersection movements will function during peak hour periods.

Level of Service definitions for unsignalized intersections as defined by the ***Highway Capacity Manual*** are summarized in the table below.

Definition of Level of Service for Unsignalized Intersections
(see Exhibit 19-1, Highway Capacity Manual 2010)

Level of Service	Average Delay (seconds)
A	0 - 10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	More than 50s and/or v/c > 1

Level of Service (LoS) for a TWSC intersection is determined by the computed or measured *Control Delay* and is defined for each minor movement at the intersection. LoS is not defined for the major street approaches or the intersection as a whole. LoS "F" is considered to be undesirable for design or planning purposes. However, many individual turning movements at TWSC intersections and commercial entrances along urban arterial corridors operate at LoS "F" during peak hour periods.

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	36	51	0	0	26
Future Vol, veh/h	6	36	51	0	0	26
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	7	39	55	0	0	28

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	98	70	0	-	-	-
Stage 1	55	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	872	967	-	0	0	-
Stage 1	942	-	-	0	0	-
Stage 2	955	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	861	955	-	-	-	-
Mov Cap-2 Maneuver	861	-	-	-	-	-
Stage 1	942	-	-	-	-	-
Stage 2	943	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	940	-
HCM Lane V/C Ratio	-	0.049	-
HCM Control Delay (s)	-	9	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.2	-

Intersection	
Int Delay, s/veh	4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	29	78	60	0	0	42
Future Vol, veh/h	29	78	60	0	0	42
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	32	85	65	0	0	46

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	126	80	0	-	-	-
Stage 1	65	-	-	-	-	-
Stage 2	61	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	838	954	-	0	0	-
Stage 1	931	-	-	0	0	-
Stage 2	935	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	827	942	-	-	-	-
Mov Cap-2 Maneuver	827	-	-	-	-	-
Stage 1	931	-	-	-	-	-
Stage 2	923	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	908	-
HCM Lane V/C Ratio	-	0.128	-
HCM Control Delay (s)	-	9.5	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.4	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	40	56	0	0	29
Future Vol, veh/h	7	40	56	0	0	29
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	8	43	61	0	0	32

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	108	76	0	-	-	-
Stage 1	61	-	-	-	-	-
Stage 2	47	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	860	959	-	0	0	-
Stage 1	935	-	-	0	0	-
Stage 2	950	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	849	947	-	-	-	-
Mov Cap-2 Maneuver	849	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	938	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	931	-
HCM Lane V/C Ratio	-	0.055	-
HCM Control Delay (s)	-	9.1	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.2	-

Intersection	
Int Delay, s/veh	5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	86	66	0	0	46
Future Vol, veh/h	32	86	66	0	0	46
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	35	93	72	0	0	50

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	137	87	0	-	-	-
Stage 1	72	-	-	-	-	-
Stage 2	65	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	825	945	-	0	0	-
Stage 1	924	-	-	0	0	-
Stage 2	931	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	814	933	-	-	-	-
Mov Cap-2 Maneuver	814	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	897	-
HCM Lane V/C Ratio	-	0.143	-
HCM Control Delay (s)	-	9.7	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.5	-

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	40	57	0	0	31
Future Vol, veh/h	7	40	57	0	0	31
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	8	43	62	0	0	34

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	111	77	0	-	-	-
Stage 1	62	-	-	-	-	-
Stage 2	49	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	856	958	-	0	0	-
Stage 1	934	-	-	0	0	-
Stage 2	948	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	845	946	-	-	-	-
Mov Cap-2 Maneuver	845	-	-	-	-	-
Stage 1	934	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	929	-
HCM Lane V/C Ratio	-	0.055	-
HCM Control Delay (s)	-	9.1	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.2	-

Intersection	
Int Delay, s/veh	4.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	32	88	68	0	0	48
Future Vol, veh/h	32	88	68	0	0	48
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	5	10	32	10
Mvmt Flow	35	96	74	0	0	52

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	141	89	0	-	-	-
Stage 1	74	-	-	-	-	-
Stage 2	67	-	-	-	-	-
Critical Hdwy	6.9	6.5	-	-	-	-
Critical Hdwy Stg 1	5.9	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.59	3.39	-	-	-	-
Pot Cap-1 Maneuver	820	943	-	0	0	-
Stage 1	921	-	-	0	0	-
Stage 2	929	-	-	0	0	-
Platoon blocked, %			-			-
Mov Cap-1 Maneuver	809	931	-	-	-	-
Mov Cap-2 Maneuver	809	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	917	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	WBLn1	SBT
Capacity (veh/h)	-	895	-
HCM Lane V/C Ratio	-	0.146	-
HCM Control Delay (s)	-	9.7	-
HCM Lane LOS	-	A	-
HCM 95th %tile Q(veh)	-	0.5	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	4	70	1	2	52
Future Vol, veh/h	4	4	70	1	2	52
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	4	4	76	1	2	57

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	168	107	0	0	92	0
Stage 1	92	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.82	6.42	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	807	941	-	-	1503	-
Stage 1	922	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	785	917	-	-	1484	-
Mov Cap-2 Maneuver	785	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	926	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.3	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	846	1484	-
HCM Lane V/C Ratio	-	-	0.01	0.001	-
HCM Control Delay (s)	-	-	9.3	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	2	135	4	4	75
Future Vol, veh/h	3	2	135	4	4	75
Conflicting Peds, #/hr	15	15	0	15	15	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	2	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	5	2	2	5
Mvmt Flow	3	2	147	4	4	82

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	269	179	0	0	166	0
Stage 1	164	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.82	6.42	-	-	4.12	-
Critical Hdwy Stg 1	5.82	-	-	-	-	-
Critical Hdwy Stg 2	5.82	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	699	855	-	-	1412	-
Stage 1	850	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	679	833	-	-	1394	-
Mov Cap-2 Maneuver	679	-	-	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	894	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	733	1394	-
HCM Lane V/C Ratio	-	-	0.007	0.003	-
HCM Control Delay (s)	-	-	9.9	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Background Data

Bruynson Condominium Traffic Study

1.0 Steps to Develop 2020 Background Traffic Volumes

The following steps were carried out to develop a representative set of weekday AM and PM set of traffic volumes for the three study intersections on George Street that include:

- George St/Covert St
- George St/Orange St
- George St/Buck St

A set of AM and PM weekday peak period traffic counts were carried out at the three study intersections plus George St at King St for the PM period only. The counts were conducted on Wednesday May 27 (PM) and for the four intersections. A copy of the PM peak hour turning movement counts for the King/George intersection are included in the attached exhibit. Only the three study intersections were counted on Thursday May 28 (AM).

The Town suppled directional Average Daily Traffic (ADT) volume data for the King St corridor and George St immediate north and south of King Street. The volumes were taken from the *2011 Transportation Master Plan* (TMP) report. A copy of those volumes is included in the exhibit.

The proposed expansion factor for the observed May 2020 traffic volumes at the three study intersections were developed through the following steps:

- It was assumed that the TMP directional ADT volumes were actually collected in 2010 for the 2011 report.
- Since this is a well-developed established area of the Town the 2010 volumes were expanded at 1% per year (compounded) for 10 years to provide forecasted 2020 directional ADT volumes (see exhibit).
- PM peak hour volumes on urban arterials usually range from about 9% to 12% of the arterial's ADT. It was assumed that the observed May 2020 PM peak hour approach volumes at the George/King PM intersection were 10% of the ADT. The resulting 2020 ADT volumes were estimated from the observed PM volumes by expanding them by a factor of 10. These volumes are also illustrated on the exhibit.
- The two set of directional ADT volumes were then each aggregated into a total 2-way corridor volume for the following corridors:
    - King Street east of George
    - George north of King
    - George south of King
- A ratio was computed comparing the 2020 2-way ADT derived from the 2010 TMP volumes to the ADT derived from expanded 2020 observed count volumes. These volumes and ratios are illustrated on the exhibit. Summarizing as follows:
    - King Street east of George – 0.8
    - George north of King – 1.5
    - George south of King – 1.0

These ratios would suggest that the volumes in the King Street East and George Street South corridors are returning to more usual peak hour levels. However, the George North corridor based on the

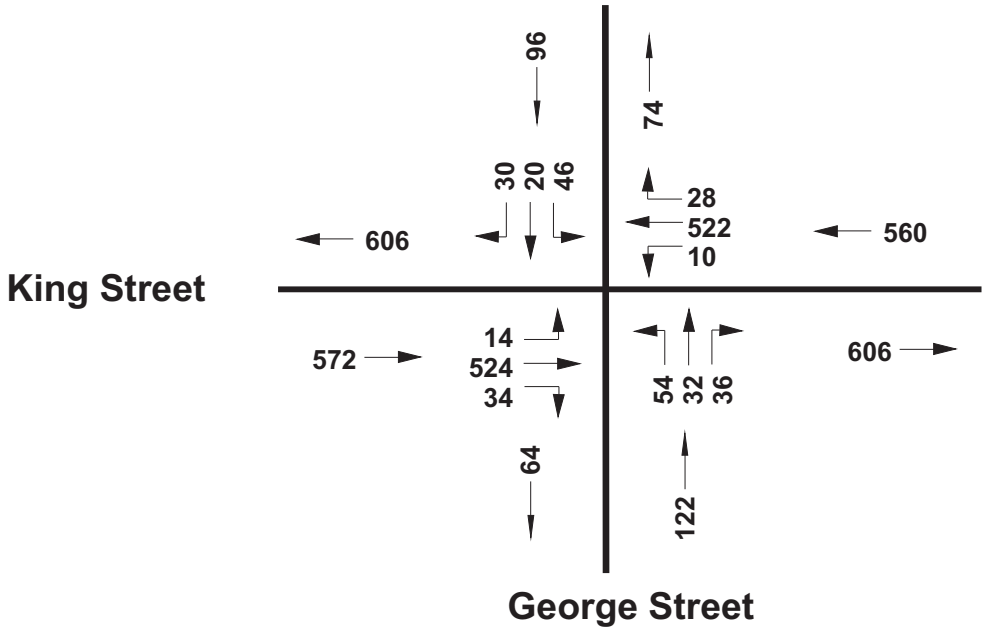
observed PM peak hour volumes appears to be about 50% of what would normally be expected based on historic TMP data. Much of the traffic on this part of George Street comes from Covert Street. This street provides access to the large commercial and retail parking area for businesses along the north side of King Street. It might be assumed that reduction in traffic as a result of reduced business activity partially explains the lower volumes in the George Street North corridor. A full investigation of this is beyond the scope of this traffic study.

2.0 Recommendation

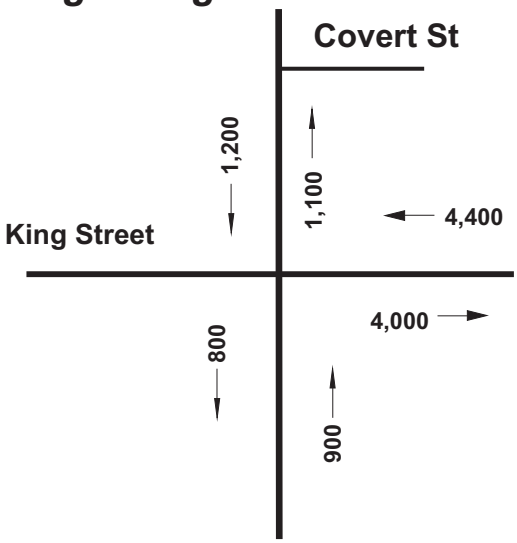
Based on the data assembled for this analysis it is recommended that the observed 2020 counts collected by Tranplan Associates for the three study intersections be expanded by 50% to provide the base 2020 background data for the study analyses. Additional background data from this analysis is available in study working papers.

Exhibit
Volumes at George St. & King St.
Cobourg, Ontario

May 27, 2020 PM Peak Hour

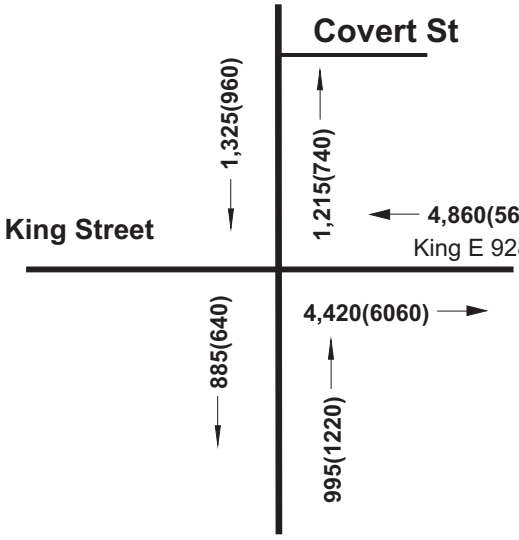


ADT Volumes
King/George



Daily Traffic Volumes
Taken from 2011 TMP
Assumed to be 2010 ADT

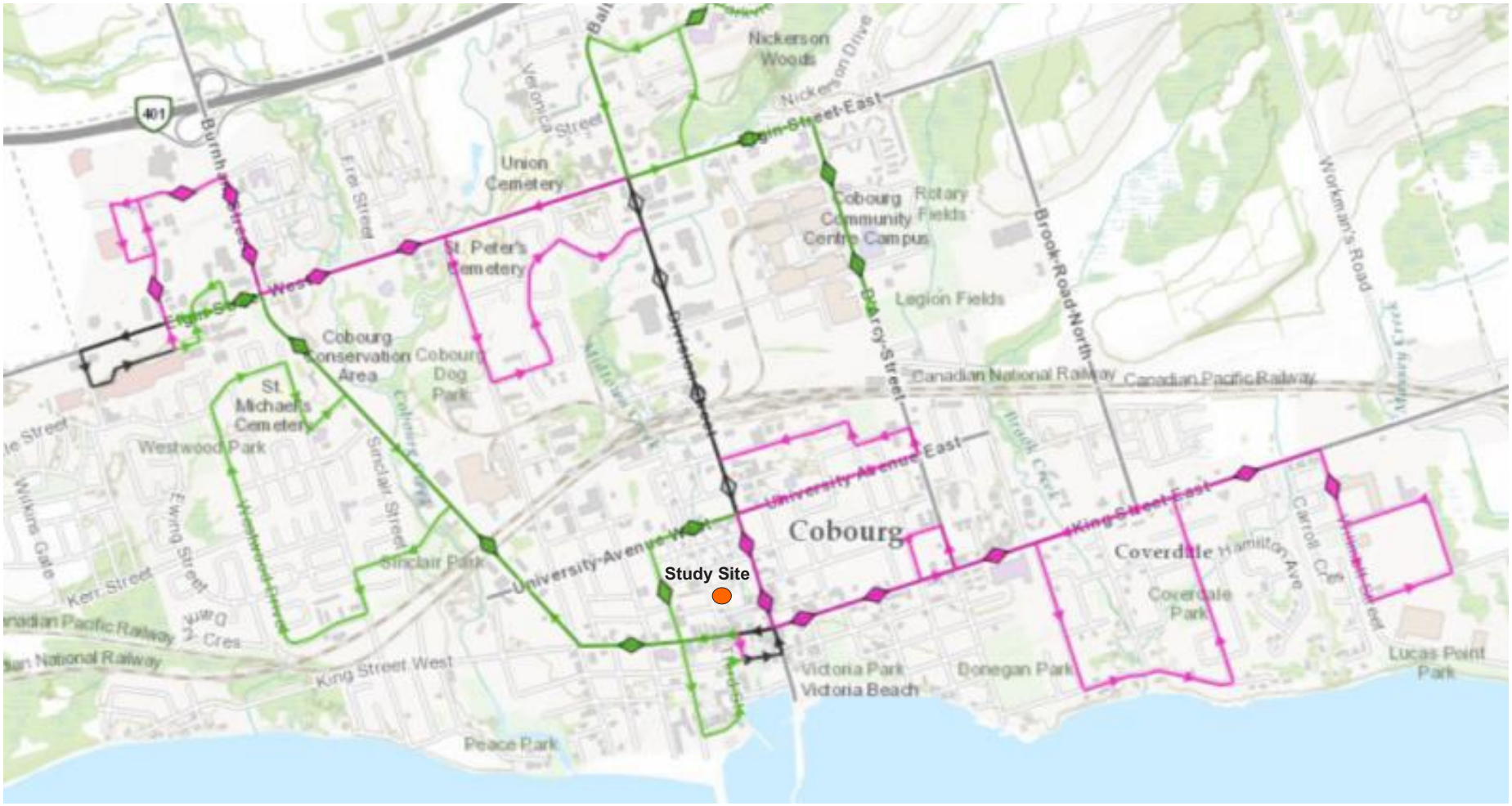
George N 2540/1700 ~ 1.5



George S 1880/1860 ~ 1.0 Note:2-way vols

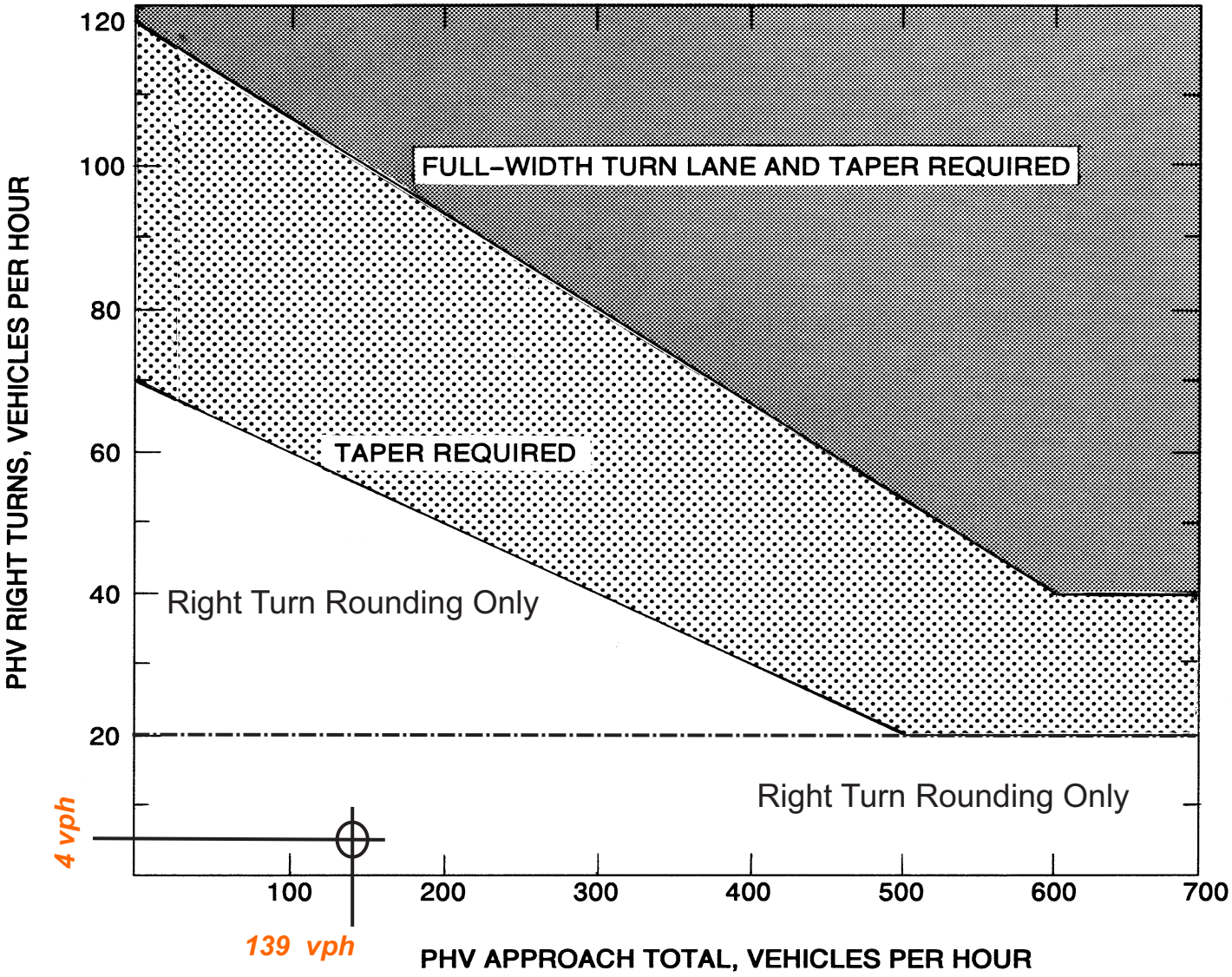
xx - 2020 ADT Forecast from 2010 @ 1% / yr
(xx) -2020 ADT Based on 10x Obs 2020 PM Pk Hr

Cobourg Transit Route Map



Auxiliary Lane Warrant Analyses

Right Turn Lane Warrant Analyses
George Street/Site Entrance
2025 PM Peak Hour Volumes



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

NOTE 1 - All Northbound Right Turn approach volumes on George St
at the Site Entrance are less than 20 vph
For the 2025 Total PM peak hour

VDOT Guidelines for Right Turn Treatment
Two Lane Highway

Note: An average of 11% for R x D will suffice.