

Transportation Impact Assessment (TIA) – Step 4: Analysis

24 Chesapeake Crescent – West Pointe Seniors Home



Prepared for Claridge Homes
by IBI Group

December 2018



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December 20, 2018

Ms. Rosanna Baggs, CET
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Dear Ms. Baggs:

**RE: CLARIDGE HOMES – 24 CHESAPEAKE CRESCENT
TRANSPORTATION IMPACT ASSESSMENT (TIA) – STEP 4: ANALYSIS**

The enclosed submission for 24 Chesapeake Crescent includes three (3) hardcopies of the Transportation Impact Assessment (TIA), as well as a USB stick containing an electronic copy of the TIA report and appendices.

The following represents Steps 1 to 4, as defined in the City TIA Guidelines. The report has addressed/incorporated the required technical comments received over the course of the submission process. Responses to technical comments are included in Appendix A.

If you have any questions regarding the contents of this submission, please do not hesitate to contact the undersigned at 613-225-1311 ext. 64029.

Sincerely,

David Hook, P.Eng.
Project Engineer

TIA Plan Reports - Certification

On 14 June 2017, the Council of the City of Ottawa adopted new Transportation Impact Assessment (TIA) Guidelines. In adopting the guidelines, Council established a requirement for those preparing and delivering transportation impact assessments and reports to sign a letter of certification.

Individuals submitting TIA reports will be responsible for all aspects of development-related transportation assessment and reporting, and undertaking such work, in accordance and compliance with the City of Ottawa's Official Plan, the Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines.

By submitting the attached TIA report (and any associate documents) and signing this document, the individual acknowledges that s/he meets the four criteria listed below:

CERTIFICATION

1. I have reviewed and have a sound understanding of the objectives, needs and requirements of the City of Ottawa's Official Plan, Transportation Master Plan and the Transportation Impact Assessment (2017) Guidelines;
2. I have a sound knowledge of industry standard practice with respect to the preparation of transportation impact assessment reports, including multi modal level of service review;
3. I have substantial experience (more than 5 years) in undertaking and delivering transportation impact studies (analysis, reporting and geometric design) with strong background knowledge in transportation planning, engineering or traffic operations; and
4. I am either a licensed¹ or registered¹ professional in good standing, whose field of expertise [check ☒ appropriate field(s)] is either transportation engineering ☐ or transportation planning ☐.

¹ License or registration body that oversees the profession is required to have a code of conduct and ethics guidelines that will ensure appropriate conduct and representation for transportation planning and/or transportation engineering works.

Dated at Ottawa this 20th day of December, 2018.

Name: David Hook

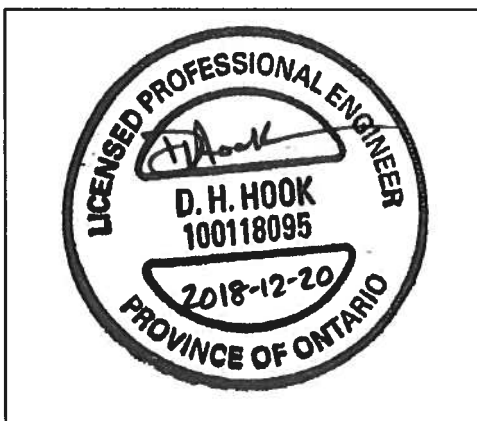
Professional Title: Project Engineer



Signature of Individual certifier that she/he meets the above four criteria

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1 Introduction

The following Transportation Impact Assessment (TIA) Report has been prepared on behalf of Claridge Homes in support of the retirement home development application for 24 Chesapeake Crescent. The format of the TIA Report is based on the City of Ottawa 2017 Transportation Impact Assessment (TIA) Guidelines. The purpose of the TIA Report is to "identify on-site and off-site measures to be undertaken by a developer to align the transportation system's performance with the City's goals of creating an integrated land use and transportation system as expressed in the Official Plan and Transportation Master Plan"¹.

Responses to the City's comments received for the submission of the TIA Report thus far are provided in **Appendix A**.

2 Screening and Scoping

Section 2 summarizes the Screening Form and Scoping Report. The Screening Form (Section 2.1) established the need to complete the study. The Scoping Report established the existing/ planned conditions of the study, key parameters and a review of possible exemptions.

2.1 Screening Form

STEP 1 - City of Ottawa 2017 TIA Guidelines Screening Form

1. Description of Proposed Development

Municipal Address	24 Chesapeake Crescent, 164 Maravista Drive
Description of Location	Barrhaven West – Southeast corner of Strandherd Drive & Maravista Drive
Land Use Classification	Senior Adult Housing - Attached
Development Size (units)	143+/-
Development Size (acres)	1.2 acres
Number of Accesses and Locations	Three access intersections proposed off of boundary streets to accommodate the development: <ul style="list-style-type: none"> • One inbound access off of Maravista Drive • One outbound access off of Cobble Hill Drive • One all-movements loading access off of Chesapeake Crescent
Phase of Development	Single - phase
Buildout Year	TBD

¹ Ottawa 2017 TIA Guidelines, p. 3



2. Trip Generation Trigger

Considering the Development's Land Use type and Size (as filled out in the previous section), please refer to the Trip Generation Trigger checks below.

Land Use Type	Minimum Development Size
Single-family homes	40 units
Townhomes or apartments	90 units
Office	3,500 m ²
Industrial	5,000 m ²
Fast-food restaurant or coffee shop	100 m ²
Destination retail	1,000 m ²
Gas station or convenience market	75 m ²

** If the development has a land use type other than what is presented in the table above, estimates of person-trip generation may be made based on average trip generation characteristics represented in the current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual.*

The proposed development falls under the Senior Adult Housing (Attached) land use, and consists of 143 units. Based on the ITE Trip Generation Manual 9th Edition – Volume 2: Data, the proposed development will generate less than 40 vehicle trips during both peak AM and PM periods. Utilizing the person trip conversion factor of 1.28 yields a result of 37 person trips in the AM Peak Hour and 48 person trips in the PM Peak Hour. **Since this is below the City threshold of 60 person trips during the peak hours, the proposed development Trip Generation Trigger was NOT satisfied.**

3. Location Triggers

	Yes	No
Does the development propose a new driveway to a boundary street that is designated as part of the City's Transit Priority, Rapid Transit or Spine Bicycle Networks?		x
Is the development in a Design Priority Area (DPA) or Transit-oriented Development (TOD) zone?*		x

**DPA and TOD are identified in the City of Ottawa Official Plan (DPA in Section 2.5.1 and Schedules A and B; TOD in Annex 6). See Chapter 4 for a list of City of Ottawa Planning and Engineering documents that support the completion of TIA).*

Based on the results above, the Location Trigger was NOT satisfied.

4. Safety Triggers

	Yes	No
Are posted speed limits on a boundary street are 80 km/hr or greater?	x	
Are there any horizontal/vertical curvatures on a boundary street limits sight lines at a proposed driveway?		x
Is the proposed driveway within the area of influence of an adjacent traffic signal or roundabout (i.e. within 300 m of intersection in rural		x



conditions, or within 150 m of intersection in urban/ suburban conditions)?		
Is the proposed driveway within auxiliary lanes of an intersection?		x
Does the proposed driveway make use of an existing median break that serves an existing site?		x
Is there a documented history of traffic operations or safety concerns on the boundary streets within 500 m of the development?		x
Does the development include a drive-thru facility?		x

Based on the results above, the Safety Trigger was satisfied.

5. Summary

	Yes	No
Does the development satisfy the Trip Generation Trigger?		x
Does the development satisfy the Location Trigger?		x
Does the development satisfy the Safety Trigger?	x	

The Safety Trigger was satisfied. Therefore, the TIA Study must continue into the next stage (Scoping).

2.2 Description of Proposed Development

2.2.1 Site Location

The proposed development, part of the lands municipally known as 24 Chesapeake Crescent and 164 Maravista Drive, is shown in **Exhibit 1**. The portion of these lands that is proposed to be developed is approximately 1 acre in size. The development is bounded by Cobble Hill Drive to the east, Chesapeake Crescent to the south, Strandherd Drive to the west and Maravista Drive to the north.

2.2.2 Land Use

The proposed site plan for the subject site is shown in **Exhibit 2**. The land is currently undeveloped, and is zoned as a Residential Fifth Density. The proposed development is a six-storey retirement residence, classified under the ITE land usage as Senior Adult Housing (Attached). For the purposes of this study, full occupancy of the proposed development was assumed by the 2019 horizon year. However, the assumed buildout horizon year is highly dependent on market forces. It is possible full occupancy won't be achieved by the buildout horizon year.

2.2.3 Site Layout

The proposed single-phase development consists of a six-storey retirement residence, with 143 units and 51 parking spaces. The proposed development will provide 2.0 m wide sidewalks to facilitate pedestrian access to and from the retirement home. Three private approaches will facilitate access between boundary streets and the proposed development. One inbound only access will be provided along Maravista Drive for inbound traffic, while outbound traffic will exit via Cobble Hill Drive. A separate all movements access intended for heavy vehicle loading will be provided off of Chesapeake Crescent.

2.2.4 Transit, Pedestrian and Cycling Facilities

Sidewalks will be provided to facilitate access to the adjacent roadway network and surrounding neighbourhood. The proposed development will not include any cycling or transit facilities.

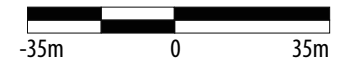


24 Chesapeake Crescent
Transportation Impact Assessment

EXHIBIT 1
Site Location

PROJECT No.:
DATE:
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118197
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STRANDHERD DRIVE

MARAVISTA DRIVE

COBBLE HILL DRIVE

CHESAPEAKE CRESCENT

6 Storey Building
143 Units
Basement Floor : 94.45m
Ground Floor : 97.60m

ACCESS #1

ACCESS #2

ACCESS #3

LOADING AREA
10000

BASEMENT UNDER
BUILDING FOOTPRINT.
1 FLOOR



24 Chesapeake Crescent
Transportation Impact Assessment

EXHIBIT 2
Site Plan

PROJECT No.:
DATE:
SCALE:

118197
December 2018





2.3 Existing Conditions

2.3.1 Existing Road Network

2.3.1.1 Roadways

Strandherd Drive is an arterial road under the jurisdiction of the City of Ottawa that extends from Fallowfield Road in the west to Prince of Wales Drive and the Vimy Memorial Bridge in the east. Within the vicinity of the subject site, Strandherd Drive has a four-lane divided cross-section and a ROW protection of 44.5 m. Strandherd Drive has a posted speed limit of 80 km/h along the frontage of the subject site.

Cobble Hill Drive is a collector road under the jurisdiction of the City of Ottawa that extends from Fallowfield Road in the north to Cedarview Road in the south. Cobble Hill Drive has a two-lane cross-section, a ROW protection of 24 m and a speed limit of 50 km/h.

Maravista Drive is a collector road under the jurisdiction of the City of Ottawa that extends from Strandherd Drive in the west to Weybridge Drive in the east. Maravista Drive has a two-lane cross-section, a ROW protection of 24 m and a posted speed limit of 40 km/h.

Chesapeake Crescent is a local road under the jurisdiction of the City of Ottawa that intersects with Cobble Hill Drive at Fosterbrook Way and Lamplighters Drive 75 m further north. Chesapeake Crescent has a two-lane cross-section, a ROW protection of 18 m and a speed limit of 50 km/h.

2.3.1.2 Intersections

The subject site is located at the south-east corner of the following intersection:

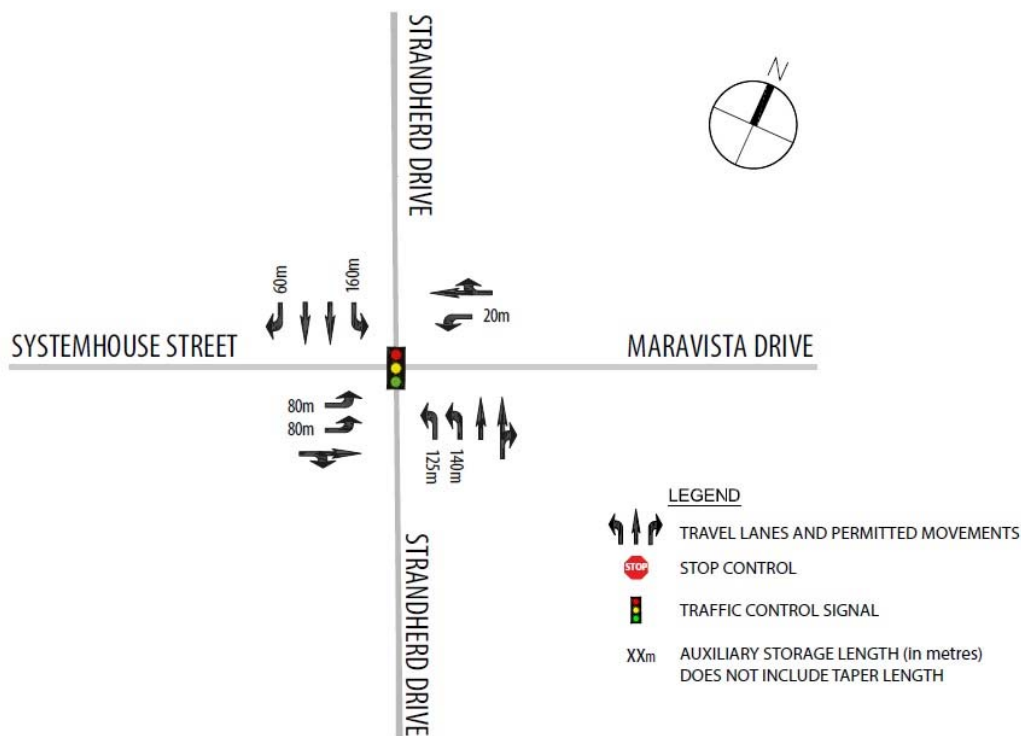
Strandherd Drive and Maravista Drive/ Systemhouse Street is a four-legged, signalized intersection with fully-integrated pedestrian and cycling facilities provided at all four (4) approaches. Concrete sidewalks with a minimum width of 2.0m are provided at each corner of the intersection. Cycling infrastructure includes north-south bicycle traffic signals, north-south cross-rides and bike boxes on the east and west approaches. The intersection contains the following lane configurations:

- Double left-turn lanes on the northbound and eastbound approaches and single left-turn lanes on the southbound and westbound approaches.
- Two (2) through lanes are provided on the north and south approaches, while single through lanes are provided on the east and west approaches.
- A dedicated southbound right-turn lane is provided along Strandherd Drive; all other approaches have shared through/ right-turn lanes.

The existing lane configurations and traffic control for the Strandherd Drive and Maravista Drive/ Systemhouse Street intersection are shown in **Exhibit 3**.

At the time of this study, there were approximately 30 existing residential driveways located within 200m each of the three proposed site access locations. The vehicular volumes accessing/ egressing these existing driveways were expected to be negligible, as all adjacent driveways serve townhome units. Therefore, no significant operational conflicts were anticipated at any of the private approaches for the subject site.

EXHIBIT 3 – Strandherd Drive and Maravista Drive/ Systemhouse Street



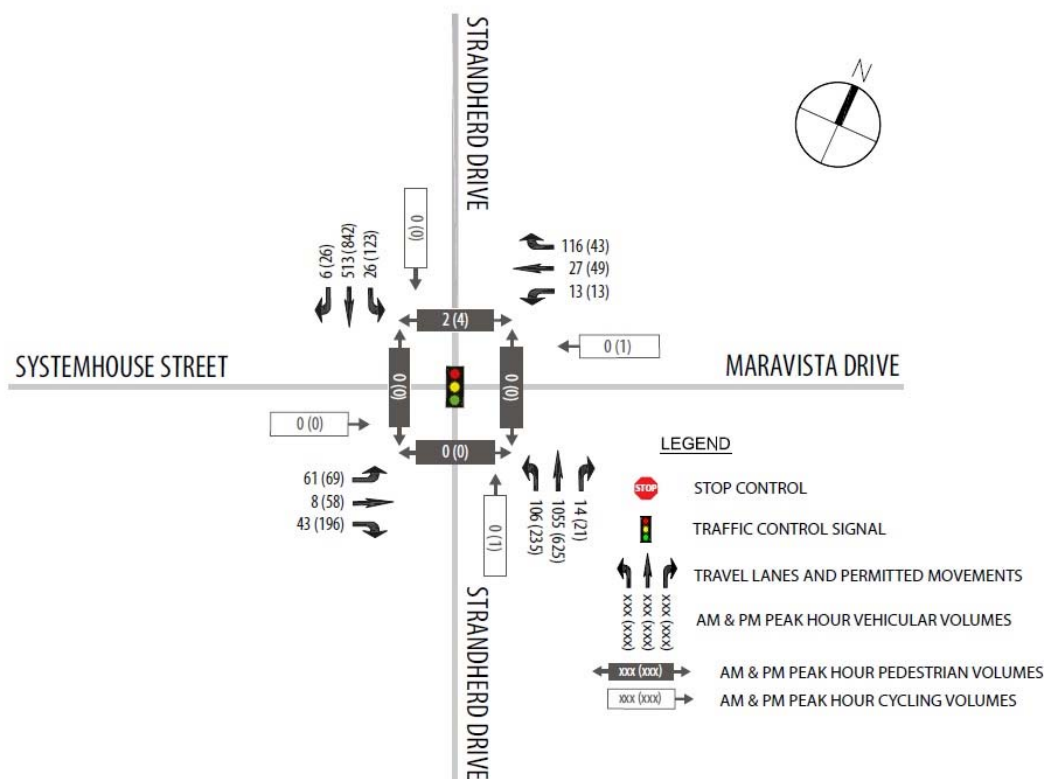
2.3.1.3 Traffic Management Measures

Traffic management or traffic calming measures are provided along Maravista Drive to the east of the subject site. Flexible speed limit signs are mounted in the centre of the roadway, and speed limits are also painted directly onto the pavement to reduce speeding along Maravista Drive.

2.3.1.4 Existing Traffic Volumes

The Existing (2018) peak hour traffic volumes for Strandherd Drive and Maravista Drive/ Systemhouse Street are shown in **Exhibit 4**. Traffic count data is provided in **Appendix B**.

EXHIBIT 4 – Existing (2018) Pedestrian, Cycling and Vehicular Volumes



2.3.2 Existing Bicycle and Pedestrian Facilities

Strandherd Drive provides 2.0 m wide grade-separated cycle tracks on both sides of the road and bicycle signals at the intersection with Maravista Drive. Bike boxes are provided on the east and west approaches to allow cyclists to make a two-stage left turn from either the northbound or southbound directions on Strandherd Drive.

Sidewalks on Strandherd Drive front the proposed development and extend further north of Maravista Drive. A paved shoulder exists south of the proposed development on Strandherd Drive. Concrete sidewalks exist on both sides of Maravista Drive, Cobble Hill Drive, as well as the south side of Chesapeake Crescent within the vicinity of the subject site.

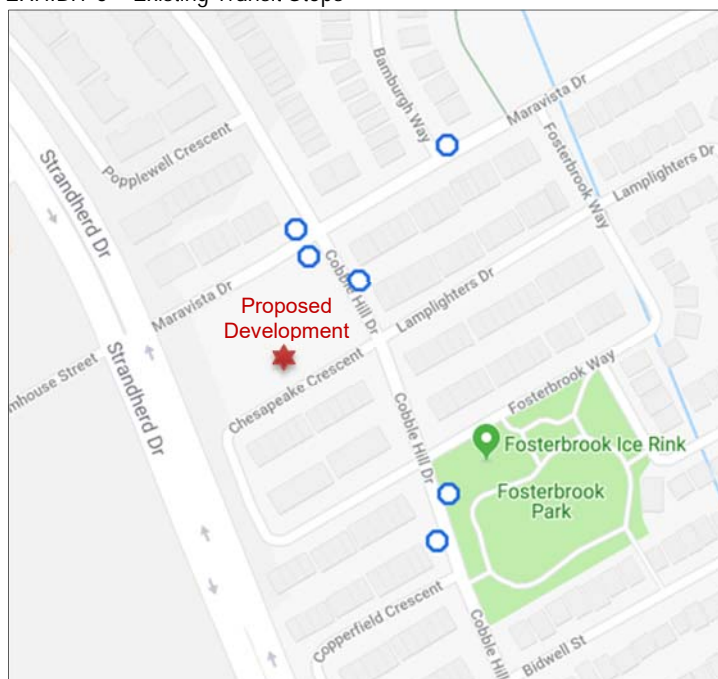
2.3.3 Existing Transit Facilities and Services

There are two OC Transpo routes within the vicinity of the subject site:

- Route 170** Fallowfield/ Barrhaven Centre is a regular/ all-day route with 30 minute headways. The bus service is provided from Fallowfield Station to Barrhaven Centre via Larkin Drive, Cedarview Road, Trinity Common CitiGate, Walter Baker, Malvern Drive and Greenbank Road.
- Route 272** Cobble Hill/ Mackenzie King is a weekday commuter route operating during the AM and PM peak hours with 20 minute headways. Transit service is provided from Mackenzie King Station to Cobble Hill Drive via LeBreton, Bayview, Tunney's Pasture, Westboro, Dominion, Lincoln Fields, Queensway, Iris, Baseline, Fallowfield, Greenbank, Cedarview, and Maravista.

Exhibit 5 shows the existing transit stops in the study area. Transit data is provided in Appendix C.

EXHIBIT 5 – Existing Transit Stops



2.3.4 Collision History

A review of historical collision data has been provided. The City requires a safety review if there are more than 6 collisions for any one movement or of a discernible pattern, over a five year period have occurred. **Table 1** summarizes all reported collisions between January 1, 2013 and January 1, 2018.

TABLE 1 – Reported Collisions within Study Area

LOCATION	TOTAL # OF REPORTED COLLISIONS OF ANY ONE MOVEMENT OR OF A DISCERNABLE PATTERN (COLLISION TYPE)
Strandherd Drive and Maravista Drive	4 (Angle) 4 (Rear End)
Maravista Drive and Cobble Hill Drive	3 (Angle)
Cobble Hill Drive and Chesapeake Drive / Lamplighters Drive	1 (SMV)
Strandherd Drive between Fallowfield Road and Maravista Drive	3 (Rear End) 3 (SMV)
Strandherd Drive between Maravista Drive and Kennevale Drive	3 (Rear End)

SMV: single motor vehicle

Based on **Table 1**, there are no discernable patterns present in the collision data. A copy of the City collision records is available in **Appendix D**.

2.4 Planned Conditions

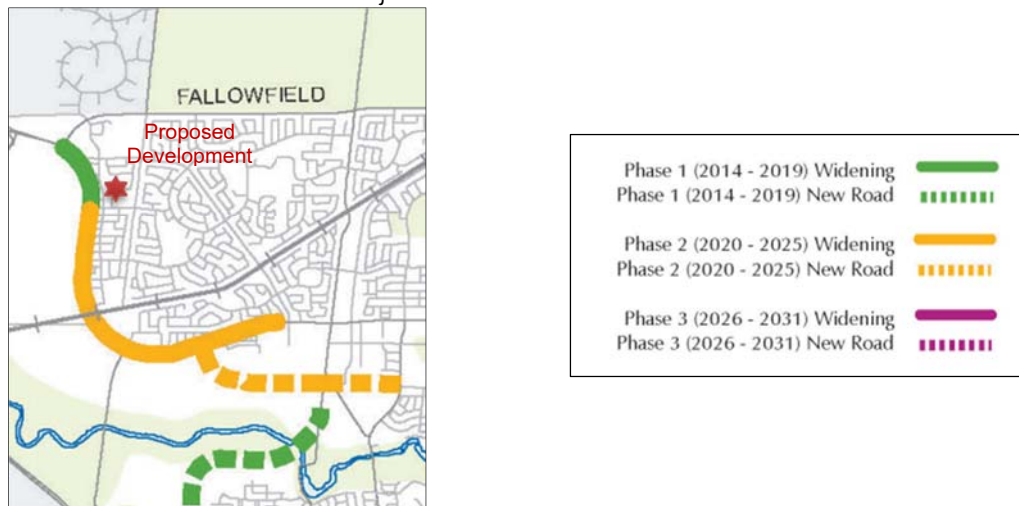
2.4.1 Changes to the Study Area Transportation Network

2.4.1.1 Future Road Network Projects (TMP)

The City of Ottawa 2013 Transportation Master Plan (TMP) has established a Road Network Concept Plan for Ottawa which includes future road infrastructure projects that will be required to support the City's growth projections and travel behaviour targets by 2031.

The TMP has also identified an Affordable Road Network, as shown in **Exhibit 6**, which is made up of a subset of the projects in the Network Concept Plan that can be realistically constructed by 2031, given restrictions to the availability of funds that are expected during this period.

EXHIBIT 6 – Future Road Network Projects



Phase 1 of the Strandherd Drive Widening has been completed, as defined in the TMP. The arterial road has been widened from two (2) lanes to four (4) lanes from Fallowfield Road to 140 m south of Maravista Drive.

Phase 2 of the TMP indicates that the 3.3 km section of Strandherd Drive will be widened further south and east of the Phase 1 limits, from 140 m south of Maravista Drive to Jockvale Road. According to the City, the Strandherd Drive widening is being completed under a compressed timeline. The detailed design is expected to be complete by the end of 2018, so that construction can occur from 2019 to 2022².

2.4.1.2 Future Transit Facilities and Services

According to City of Ottawa's Rapid Transit and Transit Priority – 2031 Affordable Network, there are no proposed transit facilities and services within the vicinity of the subject site.

2.4.1.3 Future Cycling and Pedestrian Facilities

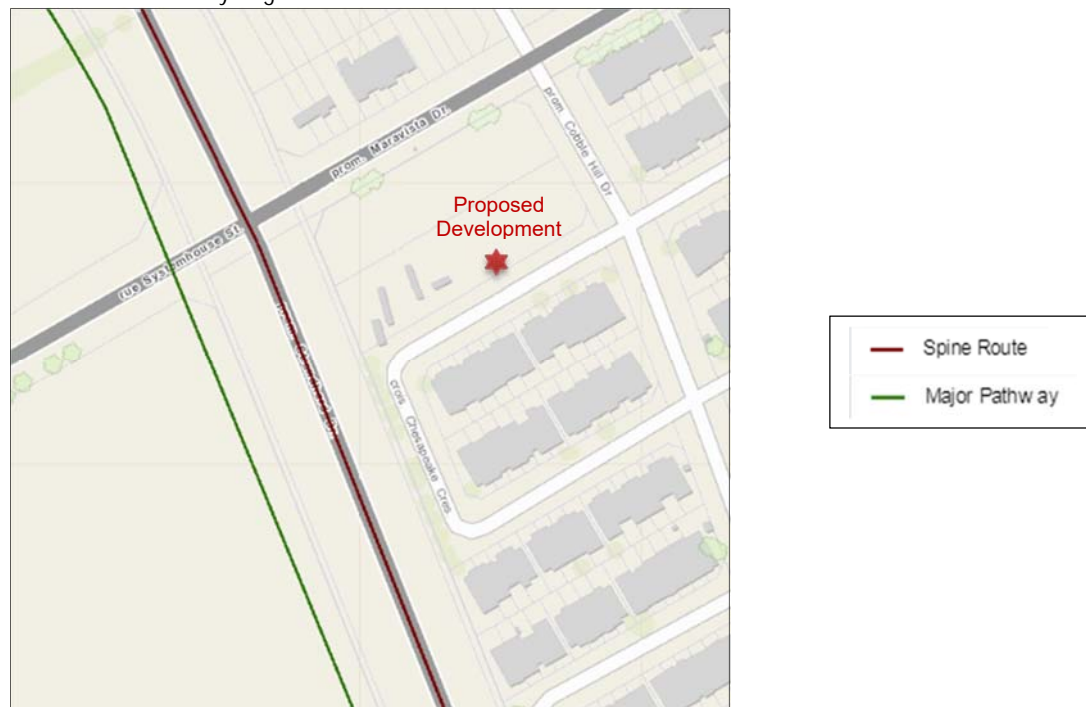
The Strandherd Drive widening from Maravista Drive to Jockvale Road will integrate cycling and pedestrian facilities into the cross-section of the road. Provisions will be in the form of a multi-use pathway on both sides of Strandherd Drive.

² Strandherd Drive Widening – <https://ottawa.ca/en/city-hall/public-engagement/projects/strandherd-drive-widening-maravista-drive-jockvale-road>

According to GeoOttawa, Strandherd Drive is designated as a spine route and major pathway route in the City's Ultimate Cycling Network.

Exhibit 7 shows the future cycling connections within the vicinity of the subject site.

EXHIBIT 7 – Future Cycling Connections



2.4.2 Future Adjacent Developments

The City of Ottawa Transportation Impact Assessment (TIA) Guidelines specifies all significant developments within the study area that are likely to occur within the horizon years for the study must be identified and recognized in all TIA reports.

As indicated in Section 2.4.1.1, the City is currently undertaking the detailed design for the proposed Strandherd Drive widening from 140m south of Maravista Drive to Jockvale Road with a compressed schedule to provide additional capacity along this major commuter route to accommodate future travel demand, including traffic generated by the CitiGate development.

The future adjacent developments in **Table 2** were accounted for in the planned widening of Strandherd Drive and site-generated traffic from the subject development is expected to have a minimal impact on the overall operation of the transportation network surrounding the subject site. Therefore, neither future adjacent developments nor the evaluation of future planning horizons were included in the scope of this TIA.

Future adjacent developments within the vicinity of the subject site in the approvals process are shown in **Exhibit 8**.

TABLE 2 – Future Adjacent Developments

DEVELOPMENT NAME	TIA PREPARED BY	LAND USE	GROSS LEASABLE AREA (FT ²)	EXPECTED BUILDOUT/OCCUPANCY DATE	RECOMMENDED ROAD MODIFICATIONS
CitiGate Blocks 3 & 4	Novatech (2015)	Office	Block 3 (182,105 ft ²) Block 4 (121,275 ft ²)	2019	Widen Strandherd Drive further south from Maravista Drive to Jockvale Road



24 Chesapeake Crescent
Transportation Impact Assessment

EXHIBIT 8
Proposed Adjacent Development

PROJECT No.:
DATE:
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2.4.3 Network Concept Screenline

Not Applicable. The proposed development is expected to generate less than 200 person trips during the weekday morning or afternoon peak hours. As indicated by preliminary trip generation results, the impact of the development will be localized and minor. Therefore, there is no requirement to undertake a review of the Network Concept.

2.5 Study Area

Based on the review of the collision analysis, transportation infrastructure and road network adjacent to the subject site, the proposed study area will be limited to Maravista Drive to the north, Cobble Hill Drive to the east, Chesapeake Crescent to the south and Strandherd Drive to the west.

Segment and Intersection Multi-modal Level of Service (MMLOS) analysis will be conducted within the study area to assess existing conditions for all study area roadway segments and intersections. The impacts of development traffic are expected to be minor and localized, since the Trip Generation Trigger from the Screening Form (Section 2.1) was not satisfied.

This TIA will focus on safety review of site-specific impacts, integration with its boundary streets, including a functional review of the site access geometry and intersection control of the proposed site access intersections, on-site drive aisle requirements to accommodate proposed design vehicles and a review of the site's parking and loading requirements.

2.6 Time Periods

Strandherd Drive is a major cross-commuter route through Barrhaven with a complete interchange at Highway 416. Therefore, total traffic volumes are expected to constitute the 'worst case' scenario on the adjacent road network during the weekday AM and PM peak hours. These two (2) analysis periods will be used for operational analysis in the TIA.

2.7 Horizon Years

Two future horizons are proposed for any analysis conducted as part of this TIA:

- Year 2019 – opening day/ full occupancy.
- Year 2024 – opening day plus five (5) years.

2.8 Exemptions Review

The TIA Guidelines provide exemption considerations for elements of the Design Review and Network Impact components. **Table 3** identifies each element, and indicates whether or not it will be required in Step 4 – Analysis.

According to page 17 of the *TIA Guidelines (June 2017)*, since the proposed development generates less than 60 peak hour person trips, the TIA must be prepared to address the Design Review Component only. Therefore, the Network Impact Component (Modules 4.5 to 4.9) is exempt from this TIA.



TABLE 3 – Exemptions Review

TIA MODULE	ELEMENT	EXEMPTION CONSIDERATIONS	REQUIRED
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	<ul style="list-style-type: none"> Only required for site plans 	✓
	4.1.3 New Street Networks	<ul style="list-style-type: none"> Only required for plans of subdivision 	✗
4.2 Parking	4.2.1 Parking Supply	<ul style="list-style-type: none"> Only required for site plans 	✓
	4.2.2 Spillover Parking	<ul style="list-style-type: none"> Only required for site plans where parking supply is 15% below unconstrained demand 	✗
Network Impact Component (Exempt from TIA)			
4.5 Transportation Demand Management	All Elements	<ul style="list-style-type: none"> Not required for site plans expected to have fewer than 60 employees and/or students on location at any given time 	✗
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	<ul style="list-style-type: none"> Only required when the development relies on local or collector streets for access and total volumes exceed ATM capacity thresholds 	✗
4.8 Network Concept	n/a	<ul style="list-style-type: none"> Only required when proposed development generates more than 200 person-trips during the peak hour in excess of the equivalent volume permitted by established zoning 	✗

3 Forecasting

The purpose of the Forecasting section is to “generate the future transportation demand number required to analyze pre and post-development network performance to determine if a network modification is required to offset development impacts.”³

3.1 Development Generated Traffic

3.1.1 Base Trip Generation Rates

The peak hour vehicular volumes from the subject site development were determined using peak hour generation rates from the ITE Trip Generation Manual, 10th Edition. A summary of the vehicular trip generation results for the proposed development is provided in **Table 4**.

Relevant extracts from the ITE Trip Generation Manual have been provided in **Appendix E**.

TABLE 4 – Local Development Trip Generation Results

LAND USE (ITE CODE)	SIZE (units)	PERIOD	GENERATED TRIPS (VPH)		
			IN	OUT	TOTAL
Senior Adult Housing – Attached (252)	143	AM	10	19	29
		PM	20	17	37

VPH = vehicles per hour;
 Formula Rate and Splits

AM: $T = 0.20 \times X$

PM: $T = 0.26 \times X$

IN: 35%; OUT: 65%

IN: 55%; OUT: 45%

3.1.1.1 Person Trip Generation

The City's TIA Guidelines require trip generation to be expressed in terms of ‘person-trips’ rather than automobile trips in order to clearly identify the multi-modal demands of a development on the adjacent transportation network. Trip generation rates published by ITE are typically based on historical data from suburban areas with little to no access to public transit. The *City of Ottawa TIA Guidelines (June 2017)* suggest the use of a 1.28 conversion factor to obtain the equivalent number of person-trips when applying ITE data. This conversion factor is calculated under the assumption that a 1.15 vehicle occupancy rate is inherent to this data and that roughly 10% of trips are by non-auto modes and thus not captured in the rates. The results of applying these factors have been summarized in **Table 5**.

TABLE 5 – Development Person Trip Generation Results

LAND USE (ITE CODE)	FACTOR	PERIOD	GENERATED TRIPS (PPH)		
			IN	OUT	TOTAL
Senior Adult Housing – Attached (252)	1.28	AM	13	24	37
		PM	26	22	48

PPH = persons per hour

3.1.1.2 Mode Share Proportions

The total person trips generated by the proposed development were stratified by mode, based on mode share proportions in the 2011 Origin-Destination (OD) Survey for the South Nepean Traffic Assessment Zone (TAZ). Relevant extracts from the 2011 OD Survey are provided in **Appendix F**.

No adjustments were made to any sustainable modes of transportation such as transit, walking or cycling for future planning horizons. This approach should be considered conservative. The existing and proposed mode share targets for

³ Ottawa 2017 Transportation Impact Assessment Guidelines, p. 27



the South Nepean TAZ for each of the analysis horizons are outlined in **Table 6**. Of the available data, the weekday PM Peak inbound direction (i.e. To District) was determined to be the most appropriate existing mode share reference as it coincides with the peak weekday demand of the proposed development.

The transit mode share was adjusted from 24% to 15% to reflect the auto-oriented nature of Barrhaven West. The difference was shifted over to the Auto Driver mode share.

TABLE 6 – Proposed Mode Shares for South Nepean (2011 OD Survey)

TRAVEL MODE	EXISTING MODE SHARE (2011 OD SURVEY)	ADJUSTED MODE SHARE
Auto Driver	63%	72%
Transit	24%	15%
Auto Passenger	11%	No Change
Cycling	0%	
Walking	0%	
Other	2%	
Total	100%	100%

3.1.1.3 Trip Reduction Factors

Deduction of Existing Development Trips

Not applicable: The development is proposed on a greenfield site.

Pass-By Traffic

Not applicable: The subject site will not generate pass-by traffic.

Synergy/ Internalization

Not applicable: This subject site only has one land use.

3.1.1.4 Trip Generation by Mode

The mode shares in **Table 6** were applied to person trips results from **Table 5** to estimate the number of development generated trips by mode, as shown in **Table 7**.

TABLE 7 – Development Generated Traffic by Mode

TRAVEL MODE	PEAK PERIOD TRIPS BY MODE					
	AM			PM		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Auto Driver (72%)	9	17	26	19	15	34
Transit (15%)	2	4	6	4	3	7
Auto Passenger (11%)	1	3	4	3	2	5
Cycling (0%)	0	0	0	0	0	0
Walking (0%)	0	0	0	0	0	0
Other (2%)	0	1	1	1	0	1

The proposed development is expected to generate approximately 26 morning and 34 afternoon peak hour vehicular trips at full buildout.



3.1.2 Trip Distribution and Assignment

Not applicable: No trip distribution or assignment of the site-generated volumes from **Table 7** was completed as part of this TIA. The number of person trips expected to be is below the threshold of 60 person-trips during both the weekday AM and PM Peak hours. Therefore, the development of future horizons for further traffic analysis is not required.

3.2 Background Network Traffic

Not Applicable: The development of background network traffic was not included in the scope of this TIA. The Trip Generation Trigger from the Screening Form (Section 2.1) indicated that the proposed development would likely not generate more than 60 person-trips during the weekday peak hours.

3.2.1 Changes to the Background Transportation Network

Not Applicable: There are no proposed changes to the background transportation network within the study area.

3.2.2 General Background Growth Rates

Not applicable: The trip generation trigger of 60 person-trips specified in the TIA Screening Form (Section 2.1) was not satisfied in either the morning or afternoon peak hour. Therefore, it was not necessary to develop of background growth rates for the analysis of future background or future total scenarios as part of this TIA.

3.2.3 Other Area Development

Not Applicable: As discussed in Section 2.4.2, the scope of this TIA does not require that the future adjacent developments be assessed as part of this TIA.

3.3 Demand Rationalization

The following section summarizes any adjustments made to future travel demands in the study area to account for capacity limitations of the transportation network.

3.3.1 Description of Capacity Issues

Based on the Existing (2018) traffic volumes presented in **Exhibit 4**, the weekday morning and afternoon peak hour traffic volumes on Strandherd Drive are in the order of 1100 vehicles per hour distributed over two (2) peak direction travel lanes, which is well below the assumed capacity for an arterial road of 1000 vehicles per hour per lane (vphpl). Sidestreet volumes on Maravista Drive are in the order of 100-150 vehicles per hour per lane during the peak periods, which is also well below the assumed lane capacity for a collector road.

As indicated in **Table 7**, the proposed development is expected to contribute approximately 50 person-trips to the adjacent road network during the weekday morning and afternoon peak periods, which will have a negligible impact on the overall capacity of the adjacent road network.

Neither background traffic growth nor traffic generated by the proposed development is expected to trigger any traffic capacity issues on roads located within the study area.

3.3.2 Adjustment to Development Generated Demands

The site-generated traffic is expected to be easily absorbed by the transportation network, and will have a negligible impact on the overall traffic operations within the study area. Therefore, no adjustments to site-generated traffic were required for this TIA.

3.3.3 Adjustment to Background Network Demands

Not applicable: There were no adjustments made to background network demands.

4 Analysis

The purpose of the TIA Analysis component is to “assess the alignment between the transportation elements of the proposed development and the City of Ottawa’s city-building objectives and identify any opportunities to improve the alignment. It also evaluates the post-development performance of the planned transportation network based on the City’s established performance measures and targets and identifies potential mitigation measures to off-set development impacts.”⁴

4.1 Development Design

4.1.1 Design for Sustainable Modes

For consistency with the City of Ottawa’s Urban Design Guidelines and transportation policies, new developments shall provide safe and efficient access for all users while creating an environment that encourages walking, cycling and transit use.

The proposed development will have 2.0 m concrete sidewalks along Strandherd Drive, Maravista Drive, Cobble Hill Drive and Chesapeake Crescent. The sidewalks will allow for pedestrian access in and out of the proposed development. Strandherd Drive will have 2.0 m bike lanes and will provide bike boxes are provided on the east-west approach of the Strandherd Drive and Maravista/ Systemhouse Street intersection. Currently transit services exist along Cobble Hill Drive and Maravista Drive which include bus stops that directly front the proposed development.

4.1.2 Circulation and Access

The proposed Draft Plan includes an inbound and outbound vehicular private approach driveway on Maravista Drive and Cobble Hill Drive, respectively. A separate two-way loading access is provided off of Chesapeake Crescent for delivery trucks, which are expected to be infrequent and occurring only a few times per week.

There are 9 surface parking spaces provided within close proximity to the building’s main entrance, as well as 42 additional parking spaces located in the underground parking garage, which is accessed via a reverse-grade ramp adjacent to Cobble Hill Drive.

Parking for 36 bicycles will be provided on site, with 15 surface spaces near the northeast corner of the site and the remaining 21 spaces provided within the interior of the building. All surface parking spaces are proposed directly adjacent to the building’s main entrance.

The sidewalk network within the site will provide direct connectivity to existing pedestrian facilities located along to segments of Cobble Hill Drive and Maravista Drive fronting the proposed development.

4.1.3 New Street Networks

Not applicable. As the proposed development is not a part of a plan of subdivision, this section was excluded.

4.2 Parking

4.2.1 Parking Supply

The proposed development will include a total of 51 parking spaces, exceeding the minimum Zoning By-law 2008-250 Consolidation parking requirement of 0.25 spaces per unit and 1 space per 100 m² of gross floor area used for medical, health or personal services. As the proposed supply of on-site parking is greater than the By-law requirement, no further review of vehicular parking is required.

⁴ Ottawa 2017 Transportation Impact Assessment (TIA) Guidelines, p. 35

4.2.2 Spillover Parking

Not Applicable. As the proposed supply of on-site parking is greater than the requirement outlined in the Zoning By-law 2008-250 Consolidation, no further review of parking is required beyond what has been described above.

4.3 Boundary Streets

The results of the Segment Multi-Modal Level of Service (MMLOS) for the roadway segments surrounding the proposed development are provided in **Table 8**. Detailed results are provided in **Appendix G**.

There are no anticipated geometrical changes to the roadway segments planned within the timeframe of this study, therefore only one set of results is shown for all scenarios.

TABLE 8 – Segment MMLOS (All Scenarios)

INTERSECTION	LEVEL OF SERVICE			
	PLOS	BLOS	TLOS	TKLOS
Strandherd (Maravista to 60m south)	D	A	D	A
Maravista (Strandherd to Cobble Hill)	B	B	D	B
Cobble Hill (Maravista to Chesapeake)	C	D	D	B
Chesapeake (North Segment)	B	B	N/A ¹	B

Notes:

¹ Chesapeake Crescent is classified as a local road with a ROW protection of 18m. Transit service is not typically provided on local roads due to ROW constraints.

4.4 Access Intersections

4.4.1 Location and Design of Access

The proposed site accesses, which are referred to as Access #1, Access #2 and Access #3 are in accordance with the City of Ottawa Private Approach By-law 2003-447. Key items from the By-law are referenced as follows:

- Access Widths:
- The width of any one-way private approaches must be between 3.0 and 7.5 metres.
 - Access #1 and Access #2 are proposed as one-way access locations with widths of 6.0m and 4.4m, respectively. ✓
- The width of any two-way private approaches must be between 6.7 and 9.0 metres.
 - Access #3 is proposed as a two-way private approach, and has a width of 9.0 m. ✓
- Distance from Intersecting Road: For a resident development with 20-99 parking spaces, the proposed private approach must be at least 18 metres from the nearest intersecting street line.
 - Access #1 is located approximately 55m from Strandherd Drive ✓
 - Access #2 is located approximately 18m from Maravista Drive ✓
 - Access #3 is located approximately 75m from Cobble Hill Drive ✓
- Quantity and Spacing of Private Approaches: For sites with frontage between 46 and 150 metres, either one (1) two-way and two (2) one-way private approaches, or two (2) two-way private approaches are permitted. Any two (2) private approaches must be separated by at least 9.0m and can be reduced to 2.0 m in the case of two (2) one-way driveways.



- All three private approaches are located on separate property boundary streets. Therefore, quantity and spacing of private approaches is compliant with the Bylaw. ✓
- Distance from Property Line: Private approaches must be at least 3.0 metres from the abutting property line, however this requirement can be reduced to 0.3 m provided that the access is a safe distance from the access serving the adjacent property, sight lines are adequate and that it does not create a traffic hazard.
 - The proposed approaches, Access #1 to #3, are located more than 3 metres from abutting property lines. ✓

4.4.2 Intersection Control

The proposed private approach driveways subject to outbound traffic control only (Cobble Hill Drive and Chesapeake Crescent) will be stop-controlled. The proposed access off of Maravista Drive will be inbound-only, based on the circulation pattern indicated by the angle parking on site.

Further to this, it is ideal that traffic exits the development off of the sidestreet and not directly onto the auxiliary lanes on Maravista Drive.

4.4.3 Intersection Design

Since the City's Multi-Modal Level of Service (MMLOS) evaluation is not applicable to unsignalized intersections, no analysis will be undertaken at these locations.

4.4.3.1 Entrance Configuration

The detailed design of the site access driveways conform to the requirements of the City per Standard Detail Drawing SC7.1 – Curb Return at Private or Commercial Entrance, Unsignalized Intersection.

4.5 Transportation Demand Management

Not Applicable: As discussed in Section 2.8, Sections 4.5 to 4.9 are exempt from the TIA, since the Trip Generation Trigger in the Screening Form (Section 2.1) was not satisfied.

4.6 Neighbourhood Traffic Management

Not Applicable: As discussed in Section 2.8, Sections 4.5 to 4.9 are exempt from the TIA, since the Trip Generation Trigger in the Screening Form (Section 2.1) was not satisfied.

4.7 Transit

Not Applicable: As discussed in Section 2.8, Sections 4.5 to 4.9 are exempt from the TIA, since the Trip Generation Trigger in the Screening Form (Section 2.1) was not satisfied.

4.8 Review of Network Concept

Not Applicable: As discussed in Section 2.8, Sections 4.5 to 4.9 are exempt from the TIA, since the Trip Generation Trigger in the Screening Form (Section 2.1) was not satisfied.

4.9 Intersection Design

Not Applicable: As discussed in Section 2.8, Sections 4.5 to 4.9 are exempt from the TIA, since the Trip Generation Trigger in the Screening Form (Section 2.1) was not satisfied.

4.10 Summary of Improvements Indicated and Modification Options

4.10.1 Proposed Private Approaches

The following private approaches are proposed to provide access to the subject development:



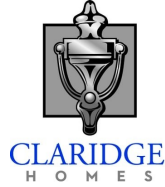
- Access #1 and Maravista Drive (one-way inbound access)
- Access #2 and Cobble Hill Drive (one-way outbound access)
- Access #3 and Chesapeake Crescent (heavy-vehicle loading access)

Low site-generated volumes projected for the site, combined with the low existing traffic volumes along the existing boundary streets will reduce the likelihood of traffic operational issues and safety concerns at the proposed access intersections. All three access intersections are expected to operate well within their acceptable levels of service with shared through-turning lanes on all approaches and stop-controlled minor approaches at Access #2 and Access #3. Therefore, no off-site improvements to the adjacent network will be required to accommodate the multi-modal demands of the proposed development.

4.10.2 Summary of Conclusions and Recommendations

The key conclusions from the TIA Analysis Report are as follows:

- The proposed development is expected to integrate well with and be safely accommodated by the existing study area transportation network.
- There is no requirement for an RMA.
- There is no requirement for a monitoring plan.



24 Chesapeake Crescent - West Pointe Seniors Home

Transportation Impact Assessment Report

Appendix A: City Comments and Responses

December 2018



24 Chesapeake Crescent TIA (Retirement Residence) – Claridge Homes
City Comments – Screening

The response from Rosanna Baggs is shown below in red regarding a query about the scope of the TIA.

Query:

We have just completed the Screening Form for a proposed 155-unit retirement residence at the southeast corner of Strandherd Drive and Maravista Drive. Please see the attached Screening Form and preliminary site plan.

The three (3) triggers were checked – Trip Generation, Location and Safety. Only the Safety Trigger was satisfied, based on the posted speed limit of Strandherd Drive is 80km/h.

There are no access intersections proposed off of Strandherd Drive or Maravista Drive. The four (4) proposed access intersections are off of Chesapeake Crescent, a local road that is expected to have minimal traffic volumes.

Based on the results of the Screening Form, we are budgeting for a ‘paired-down’ study that will include trip generation for the site, but not trip assignment or analysis of future background or background plus site-generate traffic.

The TIA Guidelines (June 2017), page 17 states the following:

“If the proposed development generates fewer than 60 peak hour person trips, the proponent must consider the Location and Safety Triggers to determine if a TIA study must be prepared to address the Design Review component. If either of these conditions exists, a TIA study must be prepared to address the Design Review component only. The proponent must complete the TIA Screening Form and proceed to and complete Step 2 – Scoping.”

As per the above statement, it is our understanding that we are not required to complete the Network Impact Component of Step 4, and should only complete the Design Review Component. However, if it is required, we will analyse the Strandherd Drive and Maravista Drive intersection with existing traffic counts in Synchro. Future traffic analysis with background or background+site-generated volumes should not be required, since the development is only expected to generate approximately 50 person trips.

We will perform Segment MMLOS for each boundary street and Intersection MMLOS for Strandherd Drive and Maravista Drive, if required.

Please confirm that we are on the same page in terms of our overall scope.

Response:

You are correct, the Network Impact Component (mods 4.5-4.9) are not required. Please complete Step 2 and submit to me.

24 Chesapeake Crescent TIA (Retirement Residence) – Claridge Homes
City Comments – Screening and Scoping

The following responses highlighted in red were prepared with regards to comments received from Rosanna Baggs' on August 21, 2018.

Formatting

1. Include a "DRAFT" water mark on the document.

Acknowledged and implemented into the report.

Module 2.1 - Existing and Planned Conditions

Element 2.1.1 - Proposed Development

Provide the following:

- Planned phasing of development;

The phasing of the development and the information regarding access points/restrictions has been addressed in the report in Section 2.2.2.

- Number of parking spaces; and

According to the draft site plan, there are 51 parking spaces proposed as part of this development, which exceeds the Zoning Bylaw requirement by 15 spaces.

- Access points - noting any restrictions (e.g., full movements, right-in/right-out, turning restrictions, etc.)

There are three access points planned for the development: an inbound access off of Maravista Drive, an outbound access off of Cobble Hill Drive and a full-movements loading access off of Chesapeake Crescent. The TIA has been updated to reflect the above noted access locations and restrictions.

Element 2.1.2 - Existing Conditions

Provide the following:

- Existing roads and ramps in the study area, including jurisdiction, classification, number of lanes, and posted speed limit;
 - Include Chesapeake

Acknowledged. A description of Chesapeake Crescent has been added to Section 2.3.1.1.

- Existing intersections, indicating type of control, lane configurations, turning restrictions, and any other relevant data (e.g., extraordinary lane widths, grades, etc.);
 - Include the intersection of Cobble Hill and Maravista and Chesapeake and Cobble Hill.

The existing unsignalized intersections of Cobble Hill Drive and Maravista Drive, as well as, Cobble Hill Drive and Chesapeake Crescent/ Lamplighters Drive were not included as potential study area intersection for evaluation in the TIA. Based on the ITE Trip Generation Manual 10th Edition – Volume 2: Data, the proposed development will generate less than the Trip Generation Trigger of 60 person trips during the weekday AM and PM Peak hours. Therefore, the assumption can be made that these two intersections will not warrant intersection modifications or changes to traffic controls within the horizon years for this TIA.

- Existing driveways to adjacent developments (both sides of all roads bordering the site) within 200 m of proposed site driveway, indicating the land use associated with the driveway;

Acknowledged. A description of existing driveways adjacent to the development has been added.

Element 2.1.3 - Planned Conditions

Identify the following:

- Other developments within the study area

Development information available in *DevApps* was reviewed within the study area.

South of Systemhouse Street, CitiGate Blocks 3 & 4, which will be developed for office use, were identified in Section 2.4.2 of the TIA.

The subject development is proposed within an existing residential community that has been fully built-out, according to GeoOttawa. As well, the retail development west of Strandherd Drive and north of Systemhouse Street was determined to be fully builtout, based on Google Streetview imagery.

Module 2.2 - Study Area and Time Periods

Element 2.2.1 - Study Area

Section 2.5 – determine if the intersections of Cobble Hill and Maravista and Chesapeake and Cobble Hill will still have the appropriate traffic controls.

Based on the rationale provided in Element 2.1.2, the traffic impacts for the above two intersections are considered negligible.

Element 2.2.3 - Horizon Years

- Five years after development build-out or full occupancy is required.

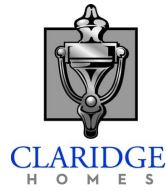
Acknowledged and implemented into the report.

Module 2.3 - Exemptions Review

NOTE: The City of Ottawa reserves the right to determine the scope of any TIA study based on its professional judgement despite these guidelines.

- Since the Trip gen is not trigger the Transportation Impact Assessment is exempted from the Network Impact Component (Mods 4.5-4.9).

Acknowledged.



24 Chesapeake Crescent - West Pointe Seniors Home

Transportation Impact Assessment Report

Appendix B: Traffic Data

December 2018





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

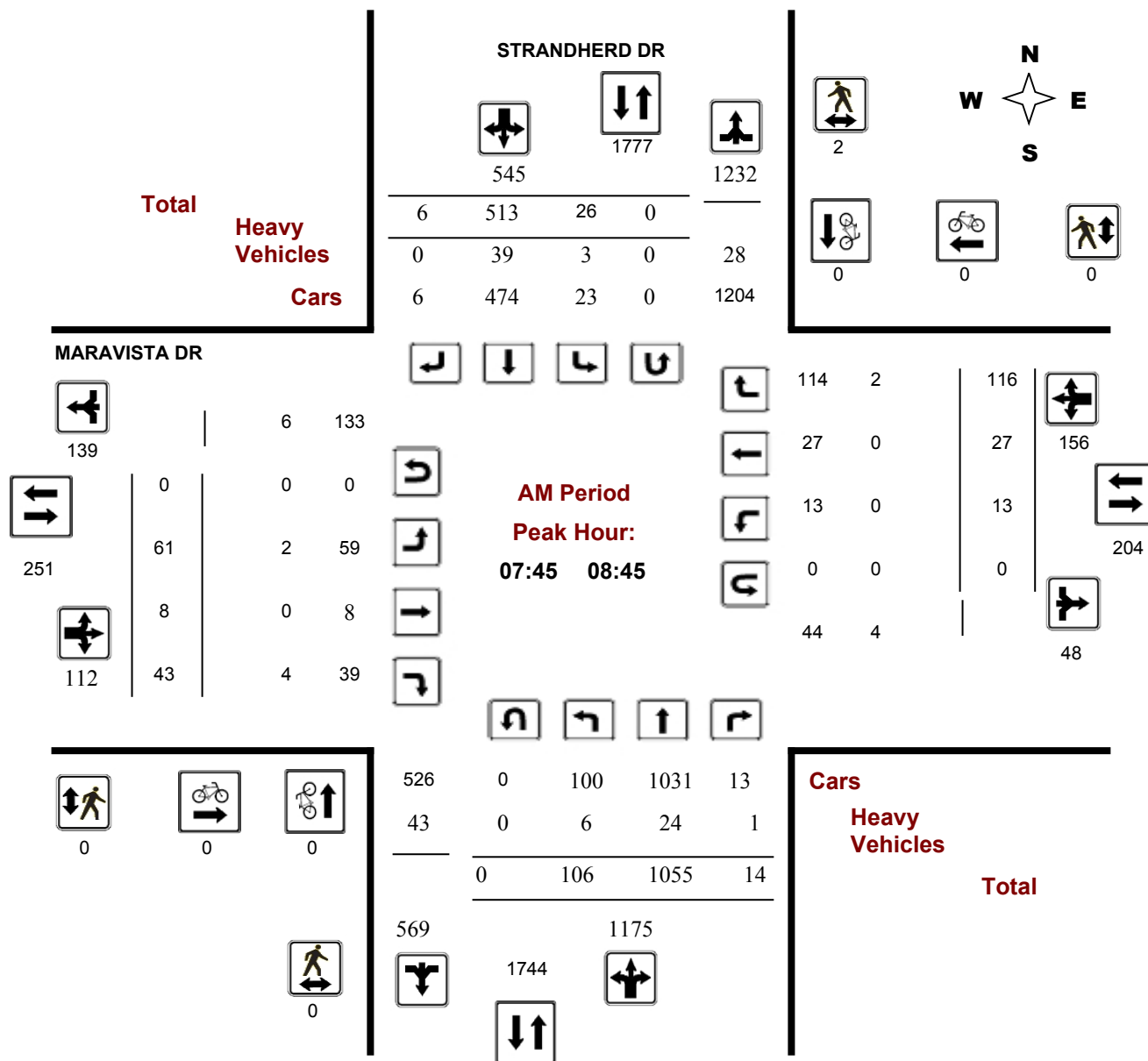
MARAVISTA DR @ STRANDHERD DR

Survey Date: Thursday, January 18, 2018

Start Time: 07:00

WO No: 37426

Device: Miovision





Transportation Services - Traffic Services

Turning Movement Count - Full Study Peak Hour Diagram

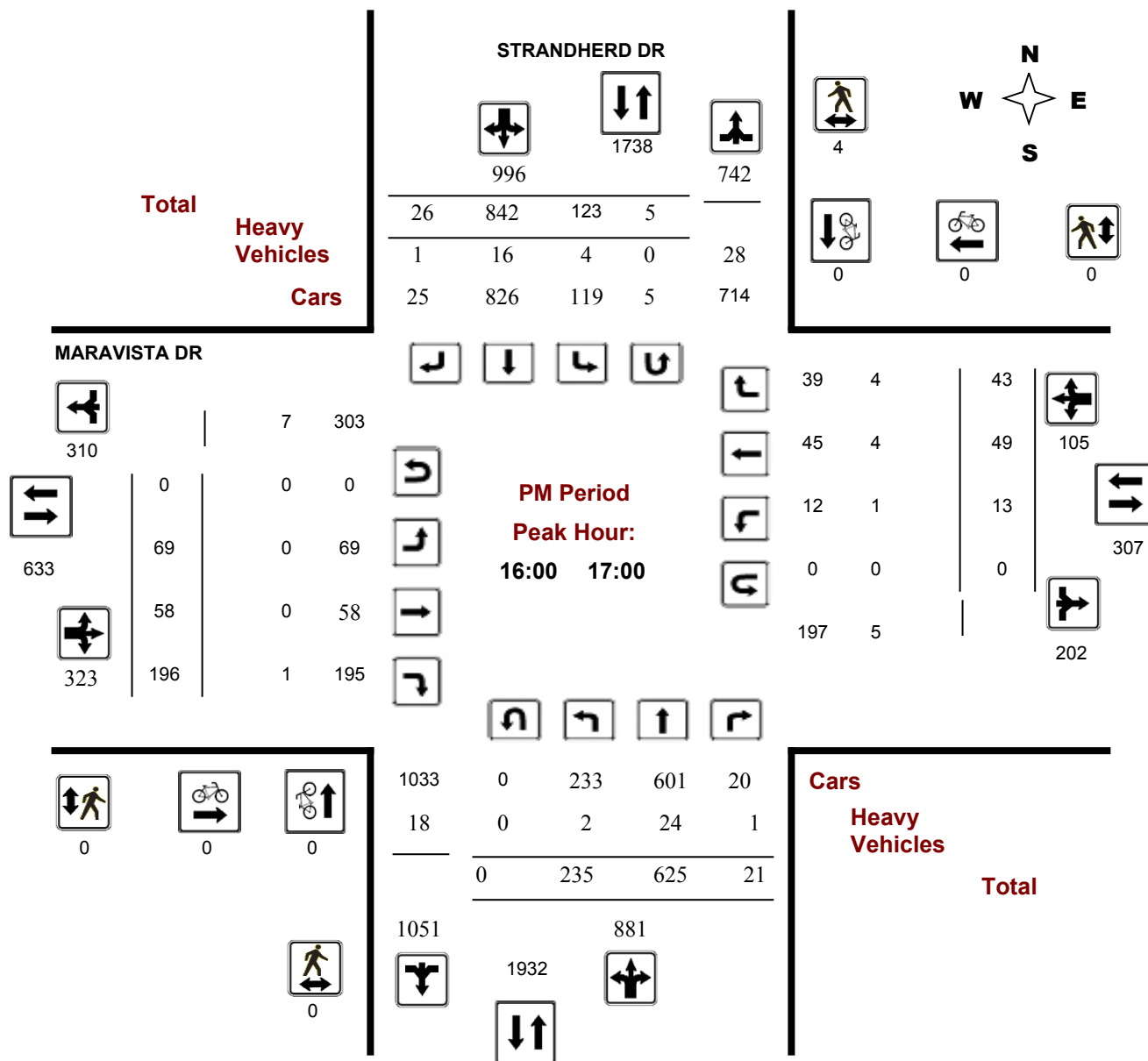
MARAVISTA DR @ STRANDHERD DR

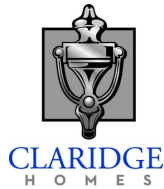
Survey Date: Thursday, January 18, 2018

Start Time: 07:00

WO No: 37426

Device: Miovision





24 Chesapeake Crescent - West Pointe Seniors Home

Transportation Impact Assessment Report

Appendix C: OC Transpo Maps

December 2018



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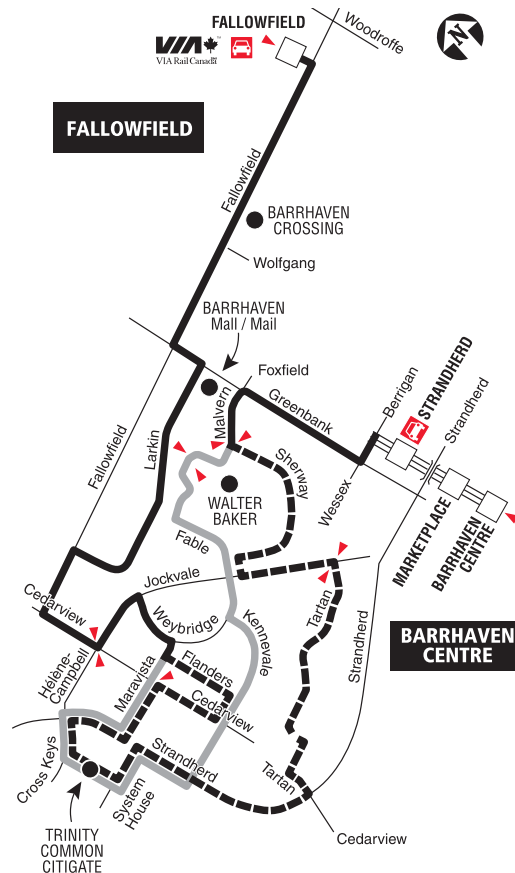
FALLOWFIELD BARRHAVEN CENTRE

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All day service

Service toute la journée



Legend • Légende

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- Park & Ride / Parc-o-Bus
- Evenings and weekends only / Soirs et fins de semaine seulement
- No service evenings and weekends / Pas de service le soir et les fins de semaine
- Timepoint / Heures de passage

2017.06



Schedule / Horaire.....613-560-1000

Text / Texto560560

plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres

Customer Relations

Service à la clientèle **613-842-3600**

Lost and Found / Objets perdus..... **613-563-4011**

Security / Sécurité **613-741-2478**

Effective June 25, 2017

En vigueur 25 juin 2017



INFO 613-741-4390
octranspo.com

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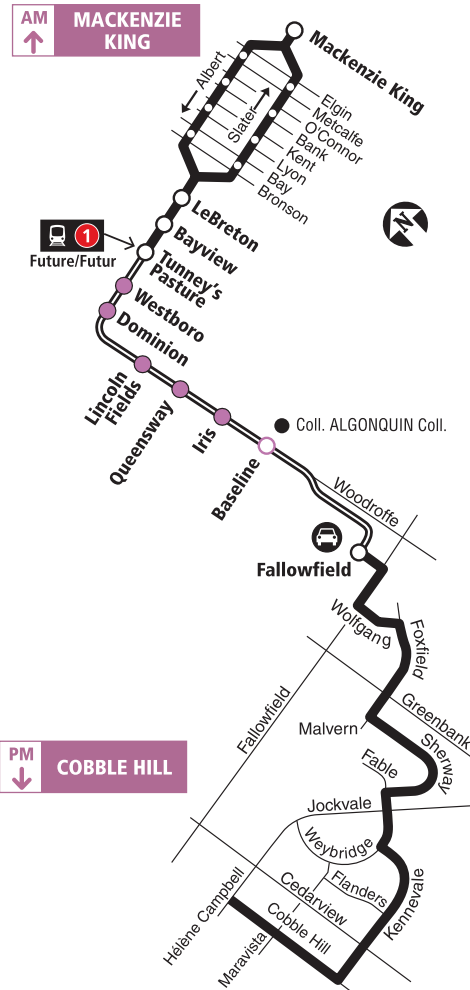
MACKENZIE KING COBBLE HILL

Connexion

Monday to Friday / Lundi au vendredi

Peak periods only

Périodes de pointe seulement



- Transitway & Station
- Limited stops: Off only in AM / No stop in PM
Arrêts limités : Débarquement en AM seulement / Aucun arrêt en PM
- Limited stops: Off only in AM / Full service in PM
Arrêts limités : Débarquement en AM seulement / Service complet en PM
- Park & Ride / Parc-o-bus

2018.05



Schedule / Horaire.....613-560-1000

Text / Texto560560

plus your four digit bus stop number / plus votre numéro d'arrêt à quatre chiffres

Customer Relations

Service à la clientèle613-842-3600

Lost and Found / Objets perdus.....613-563-4011

Security / Sécurité613-741-2478

Effective December 25, 2016

En vigueur 25 décembre 2016



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24 Chesapeake Crescent - West Pointe Seniors Home

Transportation Impact Assessment Report

Appendix D: Collision Data

December 2018





City Operations - Transportation Services

Collision Details Report - Public Version

From: January 1, 2013 **To:** December 31, 2017

Location: CHESAPEAKE CRES/LAMPLIGHTERS DR @ COBBLE HILL DR

Traffic Control: Stop sign

Total Collisions: 1

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2015-Feb-17, Tue,15:49	Clear	SMV other	P.D. only	Packed snow	West	Turning left	Pick-up truck	Snowbank/drift	

Location: COBBLE HILL DR @ MARAVISTA DR

Traffic Control:

Total Collisions: 3

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
2014-Dec-14, Sun,10:08	Clear	Angle	Non-fatal injury	Wet	North	Going ahead	Pick-up truck	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2014-Jun-13, Fri,06:49	Rain	Angle	Non-fatal injury	Wet	North	Going ahead	Automobile, station wagon	Other motor vehicle	
					West	Going ahead	Automobile, station wagon	Other motor vehicle	
2017-Feb-21, Tue,17:09	Clear	Angle	P.D. only	Dry	East	Going ahead	Pick-up truck	Other motor vehicle	
					North	Going ahead	Automobile, station wagon	Other motor vehicle	

Location: MARAVISTA DR @ STRANDHERD DR

Traffic Control: Traffic signal

Total Collisions: 11

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuvre	Vehicle type	First Event	No. Ped
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2015-Feb-17, Tue,07:23	Clear	Angle	P.D. only	Ice	West	Turning right	Pick-up truck	Other motor vehicle
					North	Going ahead	Automobile, station wagon	Other motor vehicle
2015-May-29, Fri,11:34	Clear	Angle	Non-fatal injury	Dry	South	Turning right	Automobile, station wagon	Cyclist
					West	Going ahead	Bicycle	Other motor vehicle
2016-May-31, Tue,14:10	Clear	Rear end	P.D. only	Dry	North	Going ahead	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
2017-Oct-12, Thu,12:32	Clear	Angle	P.D. only	Dry	East	Turning right	Automobile, station wagon	Other motor vehicle
					North	Making "U" turn	Automobile, station wagon	Other motor vehicle
2017-Mar-24, Fri,21:54	Freezing Rain	SMV other	P.D. only	Slush	East	Going ahead	Automobile, station wagon	Skidding/sliding
2017-Mar-13, Mon,15:20	Clear	Rear end	P.D. only	Dry	East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-01, Thu,16:49	Clear	Turning movement	P.D. only	Dry	North	Turning left	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2017-May-18, Thu,17:23	Clear	Angle	Non-fatal injury	Dry	South	Going ahead	Pick-up truck	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle

					East	Stopped	Automobile, station wagon	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2017-Nov-04, Sat,18:19	Clear	Rear end	P.D. only	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2017-Sep-26, Tue,19:50	Clear	Rear end	P.D. only	Dry	North	Slowing or stopping	Pick-up truck	Other motor vehicle
					North	Stopped	Pick-up truck	Other motor vehicle
					North	Stopped	Automobile, station wagon	Other motor vehicle
2013-Aug-22, Thu,01:30	Clear	SMV other	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Skidding/sliding

Location: STRANDHERD DR btwn FALLOWFIELD RD & MARAVISTA DR

Traffic Control: No control

Total Collisions: 9

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
2014-Jan-27, Mon,06:55	Snow	Other	P.D. only	Loose snow	South	Reversing	Tow truck	Other motor vehicle	
					North	Stopped	Police vehicle	Other motor vehicle	
					North	Stopped	Automobile, station wagon	Other motor vehicle	
					South	Other	Automobile, station wagon	Ditch	
2014-Jan-25, Sat,12:20	Drifting Snow	SMV other	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Skidding/sliding	

2014-Feb-21, Fri,14:00	Rain	SMV other	P.D. only	Wet	West	Going ahead	Automobile, station wagon	Pole (sign, parking meter)
2015-Jan-03, Sat,15:57	Snow	SMV other	P.D. only	Loose snow	East	Going ahead	Automobile, station wagon	Skidding/sliding
2015-Jan-29, Thu,19:31	Snow	Approaching	Non-fatal injury	Ice	East	Going ahead	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-18, Wed,16:00	Clear	Rear end	P.D. only	Dry	East	Going ahead	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2015-Nov-05, Thu,15:59	Clear	Rear end	P.D. only	Dry	West	Slowing or stopping	Pick-up truck	Other motor vehicle
					West	Stopped	Pick-up truck	Other motor vehicle
2017-Jan-24, Tue,08:58	Clear	Turning movement	P.D. only	Dry	West	Turning left	Automobile, station wagon	Other motor vehicle
					West	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Jun-11, Sun,13:45	Clear	Rear end	Non-fatal injury	Dry	North	Turning right	Automobile, station wagon	Other motor vehicle
					North	Turning right	Automobile, station wagon	Other motor vehicle

Location: STRANDHERD DR btwn MARAVISTA DR & KENNEVALE DR

Traffic Control: No control

Total Collisions: 7

Date/Day/Time	Environment	Impact Type	Classification	Surface Cond'n	Veh. Dir	Vehicle Manoeuver	Vehicle type	First Event	No. Ped
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2015-May-07, Thu,07:30	Clear	Sideswipe	P.D. only	Dry	South	Pulling away from shoulder or curb	Automobile, station wagon	Other motor vehicle
					South	Going ahead	Pick-up truck	Other motor vehicle
2015-Jul-10, Fri,18:10	Clear	Other	P.D. only	Dry	West	Going ahead	Automobile, station wagon	Debris falling off vehicle
					East	Going ahead	Tow truck	Other
2016-Mar-18, Fri,17:20	Clear	Rear end	Non-fatal injury	Dry	South	Going ahead	Automobile, station wagon	Other motor vehicle
					South	Stopped	Automobile, station wagon	Other motor vehicle
2015-Nov-26, Thu,13:35	Clear	Sideswipe	P.D. only	Dry	East	Changing lanes	Automobile, station wagon	Other motor vehicle
					East	Going ahead	School bus	Other motor vehicle
2016-May-11, Wed,17:38	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Slowing or stopping	Automobile, station wagon	Other motor vehicle
					East	Going ahead	Automobile, station wagon	Other motor vehicle
2017-Aug-18, Fri,09:50	Rain	SMV other	P.D. only	Wet	North	Going ahead	Passenger van	Ran off road
2017-Sep-28, Thu,18:07	Clear	Rear end	P.D. only	Dry	East	Slowing or stopping	Pick-up truck	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle
					East	Stopped	Automobile, station wagon	Other motor vehicle



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Appendix E: Trip Generation Data

December 2018



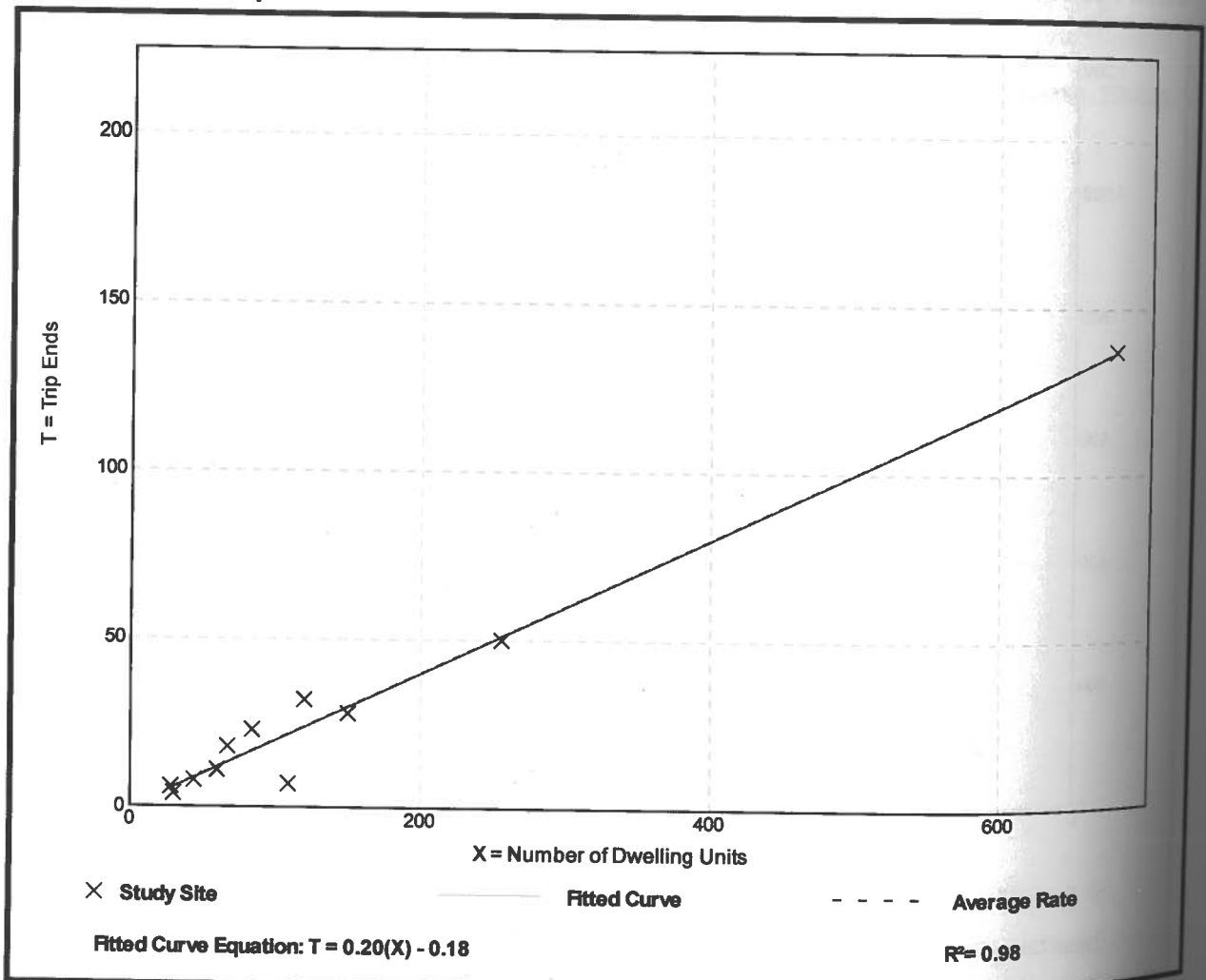
Senior Adult Housing - Attached (252)

Vehicle Trip Ends vs: Dwelling Units
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 11
 Avg. Num. of Dwelling Units: 148
 Directional Distribution: 35% entering, 65% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.06 - 0.27	0.05

Data Plot and Equation



Senior Adult Housing - Attached (252)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 11

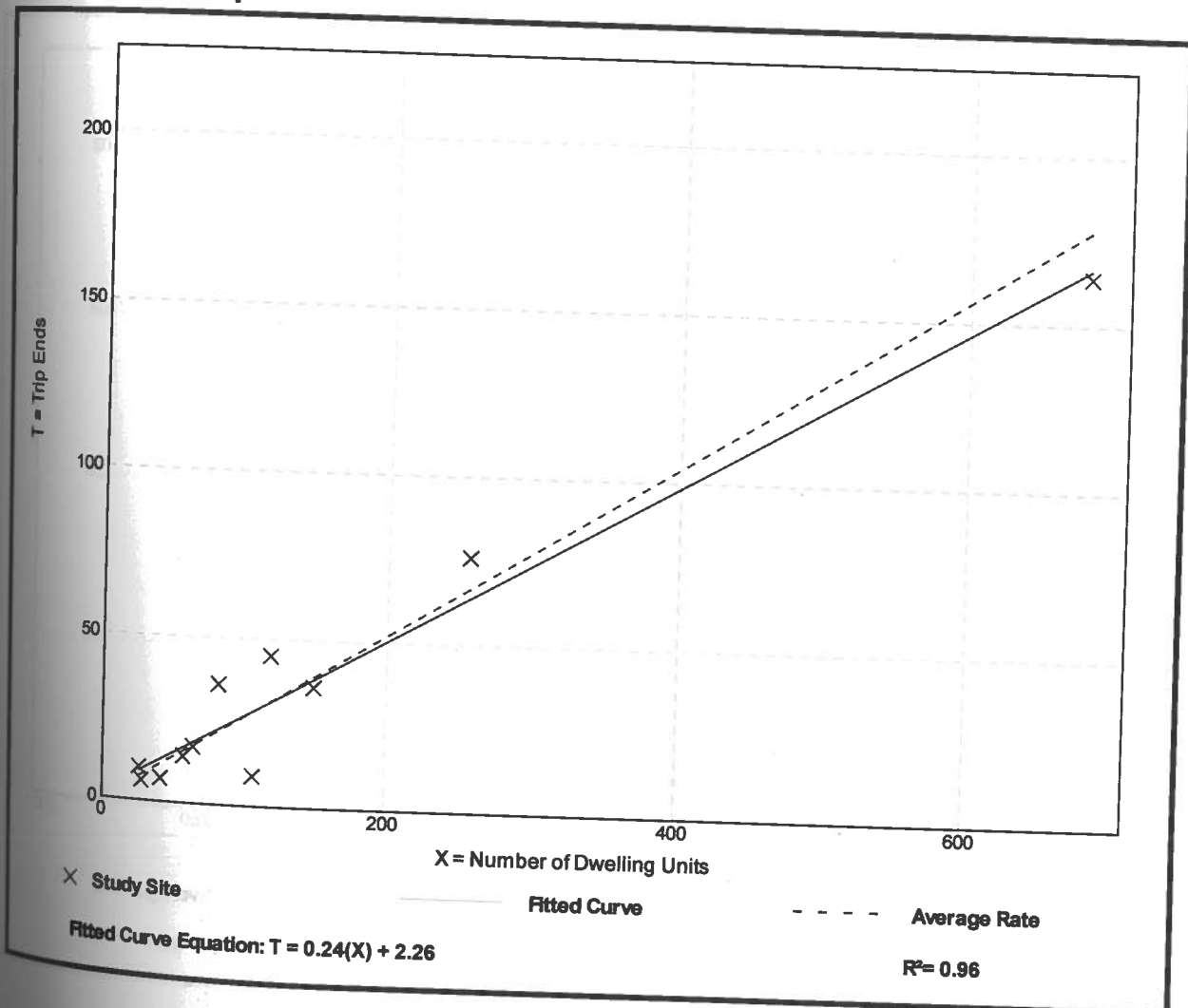
Avg. Num. of Dwelling Units: 148

Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.26	0.08 - 0.43	0.08

Data Plot and Equation





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Appendix F: 2011 OD Survey - South Nepean

December 2018



South Nepean

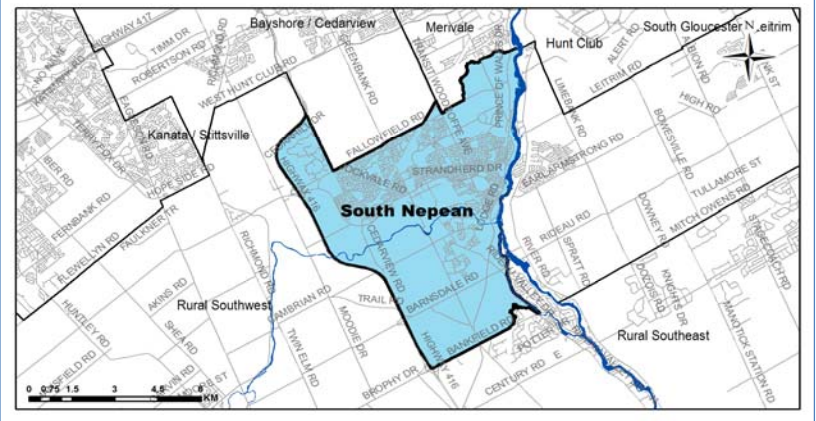
Demographic Characteristics

Population	72,750	Actively Travelled	57,830
Employed Population	35,540	Number of Vehicles	44,130
Households	26,260	Area (km ²)	54.8

Occupation Status (age 5+)	Male	Female	Total
Full Time Employed	17,630	14,730	32,350
Part Time Employed	620	2,570	3,190
Student	9,910	9,420	19,340
Retiree	3,420	4,200	7,620
Unemployed	720	500	1,220
Homemaker	180	2,390	2,570
Other	270	540	810
Total:	32,750	34,350	67,100

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,590	6,100	11,700
Licensed Drivers	24,480	25,260	49,740
Telecommuters	60	310	370
Trips made by residents	88,180	97,380	185,550

Selected Indicators	
Daily Trips per Person (age 5+)	2.77
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.07
Vehicles per Household	1.68
Workers per Household	1.35
Population Density (Pop/km ²)	1330

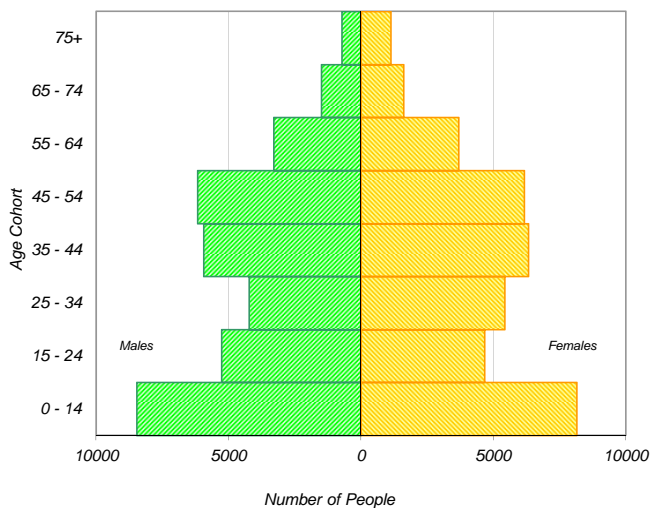


Household Size		
1 person	3,560	14%
2 persons	7,300	28%
3 persons	5,500	21%
4 persons	6,320	24%
5+ persons	3,590	14%
Total:	26,260	100%

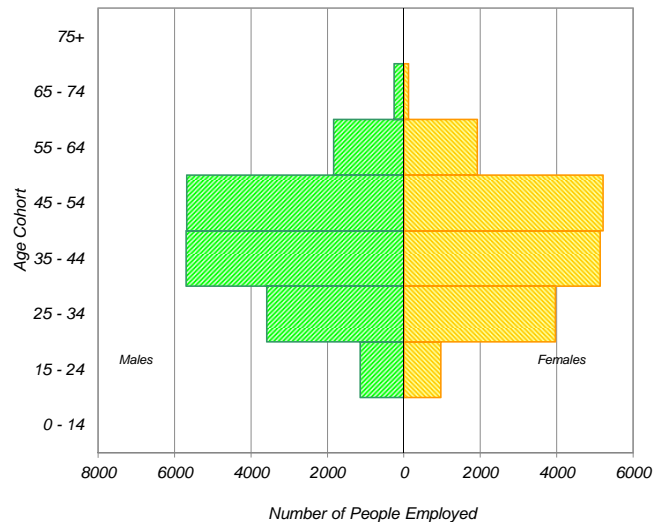
Households by Vehicle Availability		
0 vehicles	810	3%
1 vehicle	9,500	36%
2 vehicles	13,800	53%
3 vehicles	1,730	7%
4+ vehicles	410	2%
Total:	26,260	100%

Households by Dwelling Type		
Single-detached	14,530	55%
Semi-detached	3,090	12%
Townhouse	7,770	30%
Apartment/Condo	870	3%
Total:	26,260	100%

Population



Employed Population

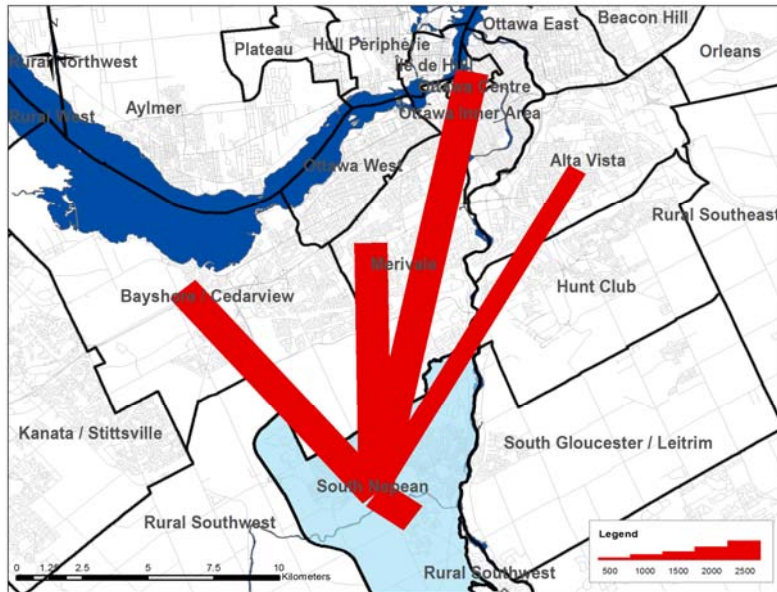


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from South Nepean

AM Peak Period



Summary of Trips to and from South Nepean

AM Peak Period (6:30 - 8:59)

Districts	Destinations of Trips From		Origins of Trips To	
	District	% Total	District	% Total
Ottawa Centre	3,820	9%	30	0%
Ottawa Inner Area	2,270	5%	340	1%
Ottawa East	630	2%	50	0%
Beacon Hill	370	1%	50	0%
Alta Vista	2,360	6%	460	2%
Hunt Club	920	2%	440	2%
Merivale	4,310	10%	790	3%
Ottawa West	1,830	4%	160	1%
Bayshore / Cedarview	3,230	8%	700	3%
Orléans	330	1%	200	1%
Rural East	20	0%	60	0%
Rural Southeast	250	1%	580	2%
South Gloucester / Leitrim	100	0%	310	1%
South Nepean	17,260	42%	17,260	74%
Rural Southwest	580	1%	970	4%
Kanata / Stittsville	1,800	4%	690	3%
Rural West	80	0%	30	0%
Île de Hull	840	2%	50	0%
Hull Périphérie	260	1%	40	0%
Plateau	0	0%	40	0%
Aylmer	60	0%	40	0%
Rural Northwest	40	0%	40	0%
Pointe Gatineau	0	0%	0	0%
Gatineau Est	0	0%	20	0%
Rural Northeast	10	0%	20	0%
Buckingham / Masson-Angers	20	0%	0	0%
Ontario Sub-Total:	40,160	97%	23,120	99%
Québec Sub-Total:	1,230	3%	250	1%
Total:	41,390	100%	23,370	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	25,640	41%	5,290	8%	4,680	6%
School	5,310	8%	1,430	2%	10,610	13%
Shopping	4,940	8%	4,220	7%	12,840	16%
Leisure	6,960	11%	4,020	6%	5,760	7%
Medical	1,720	3%	900	1%	840	1%
Pick-up / drive passenger	4,040	6%	3,920	6%	7,530	9%
Return Home	11,460	18%	40,960	65%	34,630	43%
Other	2,640	4%	2,090	3%	3,020	4%
Total:	62,710	100%	62,830	100%	79,910	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,160	75%	2,890	47%	2,120	12%
School	3,280	14%	1,170	19%	9,180	53%
Shopping	180	1%	70	1%	720	4%
Leisure	350	1%	230	4%	220	1%
Medical	400	2%	60	1%	100	1%
Pick-up / drive passenger	1,060	4%	770	13%	2,860	17%
Return Home	210	1%	640	10%	1,070	6%
Other	520	2%	290	5%	990	6%
Total:	24,160	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	410	5%	290	1%	410	2%
School	250	3%	0	0%	50	0%
Shopping	900	11%	1,090	5%	2,090	11%
Leisure	1,420	17%	790	3%	1,840	10%
Medical	190	2%	230	1%	90	0%
Pick-up / drive passenger	820	10%	1,700	7%	1,610	9%
Return Home	3,800	47%	18,990	81%	11,810	64%
Other	360	4%	490	2%	540	3%
Total:	8,150	100%	23,580	100%	18,440	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	205,450		39%
AM Peak Period	47,540	23%	36%
PM Peak Period	50,170	24%	37%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	41,340	66%	41,280	66%	39,110	49%
Auto Passenger	9,400	15%	10,030	16%	15,320	19%
Transit	9,990	16%	9,520	15%	2,260	3%
Bicycle	310	0%	320	1%	960	1%
Walk	80	0%	170	0%	13,060	16%
Other	1,600	3%	1,520	2%	9,210	12%
Total:	62,720	100%	62,840	100%	79,920	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	14,570	60%	4,360	71%	5,800	34%
Auto Passenger	1,930	8%	780	13%	3,210	19%
Transit	6,610	27%	330	5%	730	4%
Bicycle	80	0%	50	1%	320	2%
Walk	20	0%	10	0%	3,000	17%
Other	930	4%	590	10%	4,200	24%
Total:	24,140	100%	6,120	100%	17,260	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	5,840	72%	14,640	62%	8,420	46%
Auto Passenger	1,730	21%	2,680	11%	3,930	21%
Transit	350	4%	5,770	24%	650	4%
Bicycle	80	1%	110	0%	150	1%
Walk	30	0%	0	0%	3,680	20%
Other	100	1%	380	2%	1,590	9%
Total:	8,130	100%	23,580	100%	18,420	100%

Avg Vehicle Occupancy	From District		To District		Within District	
24 Hours	1.23		1.24		1.39	
AM Peak Period	1.13		1.18		1.55	
PM Peak Period	1.30		1.18		1.47	

Transit Modal Split	From District		To District		Within District	
24 Hours	16%		16%		4%	
AM Peak Period	29%		6%		7%	
PM Peak Period	4%		25%		5%	



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Appendix G: MMLOS

December 2018



SEGMENTS		Strandhard (Maravista to 60m south)	Section			Maravista (Strandhard to Cobble Hill)	Section			Cobble Hill (Maravista to Chesapeake)	Section			Chesapeake Crescent	Section		
Pedestrian	Sidewalk Width		1	2	3		1	2	3		1	2	3		1	2	3
	Boulevard Width		2.0 or more	2.0 or more	2.0 or more		2.0 or more	2.0 or more	2.0 or more		2.0 or more	2.0 or more	2.0 or more		1.8	1.8	1.8
	AADT		> 2	> 2	> 2		0	0	0		0	0	0		0	0	0
	On-Street Parking		> 3000	> 3000	> 3000		< 3000	< 3000	< 3000		< 3000	< 3000	< 3000		< 3000	< 3000	< 3000
	Operating Speed		No	No	No		N/A	N/A	N/A		N/A	N/A	N/A		N/A	N/A	N/A
Cyclist	Operating Speed		61 km/h or more	61 km/h or more	61 km/h or more		31 to 50 km/h	31 to 50 km/h	31 to 50 km/h		51 to 60 km/h	51 to 60 km/h	51 to 60 km/h		31 to 50 km/h	31 to 50 km/h	31 to 50 km/h
	Level of Service		D	D	D		B	B	B		C	C	C		B	B	B
	Type of Bikeway		Physically Separated Bikeway				Mixed Traffic				Mixed Traffic				Mixed Traffic		
	Number of Travel Lanes (per direction)		2 Travel Lanes Per Direction				1 Travel Lane Per Direction				1 Travel Lane Per Direction				1 Travel Lane Per Direction		
	Raised Median?		Yes				No				No				No		
Transit	Bike Lane Width		≥1.8 m wide bike lane				N/A				N/A				N/A		
	Operating Speed		≥ 70 km/h				≤ 40 km/h				50 km/h				50 km/h		
	Bike Lane Blockages (Commercial Areas)		Rare				Rare				Rare				Rare		
	Median Refuge		No Median Refuge				No Median Refuge				No Median Refuge				No Median Refuge		
	Number of Travel Lanes on Sidestreet		5 Lanes Crossed				2 Lanes Crossed				2 Lanes Crossed				2 Lanes Crossed		
Truck	Sidestreet Operating Speed		50 km/h				50 km/h				50 km/h				50 km/h		
	Level of Service		A				B				D				B		
	Facility Type		Mixed Traffic				Mixed Traffic				Mixed Traffic						
	Friction		Limited parking/driveway friction				Limited parking/driveway friction				Limited parking/driveway friction						
	Level of Service		D				D				D				N/A ²		
Truck	Curb Lane Width		>3.7	>3.7	>3.7		>3.7	>3.7	>3.7		>3.7	>3.7	>3.7		>3.7	>3.7	>3.7
	Number of Travel Lanes		3+	3+	3+		2	2	2		2	2	2		2	2	2
	Level of Service		A	A	A		B	B	B		B	B	B		B	B	B
	Level of Service		A				B				B				B		
	Level of Service		A				B				B				B		