DILLON CONSULTING

Argue Construction Ltd

5986-5992 Hazeldean Road

Transportation Impact Assessment

September 2019 - 19-1198

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1.0 Screening

1.1 Description of Proposed Development

Municipal Address	5986-5992 Hazeldean Road
Description of Location	The development is located on the south-east corner of the Hazeldean Road and Springbrook Drive intersection, approximately 400m east of Stittsville Main Street.
Ward	Ward 6: Stittsville-Kanata West
Land Use Classification	GM14 H(11): General Mixed Use Zone (height restriction of 11m)
Development Size	Proposed three-story mixed-use building with gross floor area of 1795.5m^2 (3 floors)
Number of accesses and locations	One access located approximately 40 metres east of Springbrook Drive
Phases of development	Single phase
Build-out year	2020

1.2 Trip Generation Trigger

Land Use Type	Minimum Development Size	Yes	No
Single-family homes	40 units		x
Townhomes or apartments	90 units		x
Office	3,500 sq.m.		x
Industrial	5,000 sq.m.		x
Fast-food restaurant or coffee shop	100 sq.m.		x
Destination retail	1,000 sq.m.		x
Gas station or convenience market	75 sq.m.		x
Other	60 person trips or more		x

Table 1 outlines the expected trip generation rates for the site. Residential trip rates were taken from Table 6.1 and Table 6.2 of the TRANS Trip Generation Residential Trip Rates report (tables included in Appendix A). Office trip generation rates and the Construction Rental land use were taken from the ITE Trip Generation Manual, 10th Edition.

Table 1: Proposed Development Vehicle Trip Generation Rates

Land Use	ITE Code	Units	AM Peak Hour			PM Peak Hour		
			Rate	In	Out	Rate	In	Out
Office (per 1,000 sq. ft.)	710	10.44	1.16	86%	14%	1.15	16%	84%
Residential	-	6	0.23	22%	78%	0.26	62%	38%
Construction Rental (Existing, per 1,000 sq. ft.)	811	2.8	0.99*	72%*	28%*	0.99	28%	72%

* Note: A trip generation rate was not provided by ITE for the AM peak hour, therefore the PM peak hour rate was applied, and the directional trip distribution reversed.

Table 2 calculates the trips expected to be generated by each use type in the AM and PM peak periods.

Table 2: Proposed Development Vehicle Trip Generation Traffic Volumes

Land Use	Units	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Office (per 1,000 sq. ft.)	10.44	12	10	2	12	2	10
Residential	6	1	0	1	2	1	1
Construction Rental (Existing, per 1,000 sq. ft.)	2.8	3	2	1	3	1	2
Total		16	12	4	17	4	13

Using a mode share of 67% for auto driver in Kanata/Stittsville for residential, and an auto driver mode share of 78% for other land uses, the number of persons generated by the site is expected to be 21 and 22 person trips during the AM and PM peak hours respectively. The Origin Destination survey results for Kanata/Stittsville can be found in Appendix B.

1.3 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

1.4 Safety Triggers

	Yes	No
Are posted speed limits on a boundary street 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 conditions, or within 150 m of intersection in urban/ suburban conditions)?	x	
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 is 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

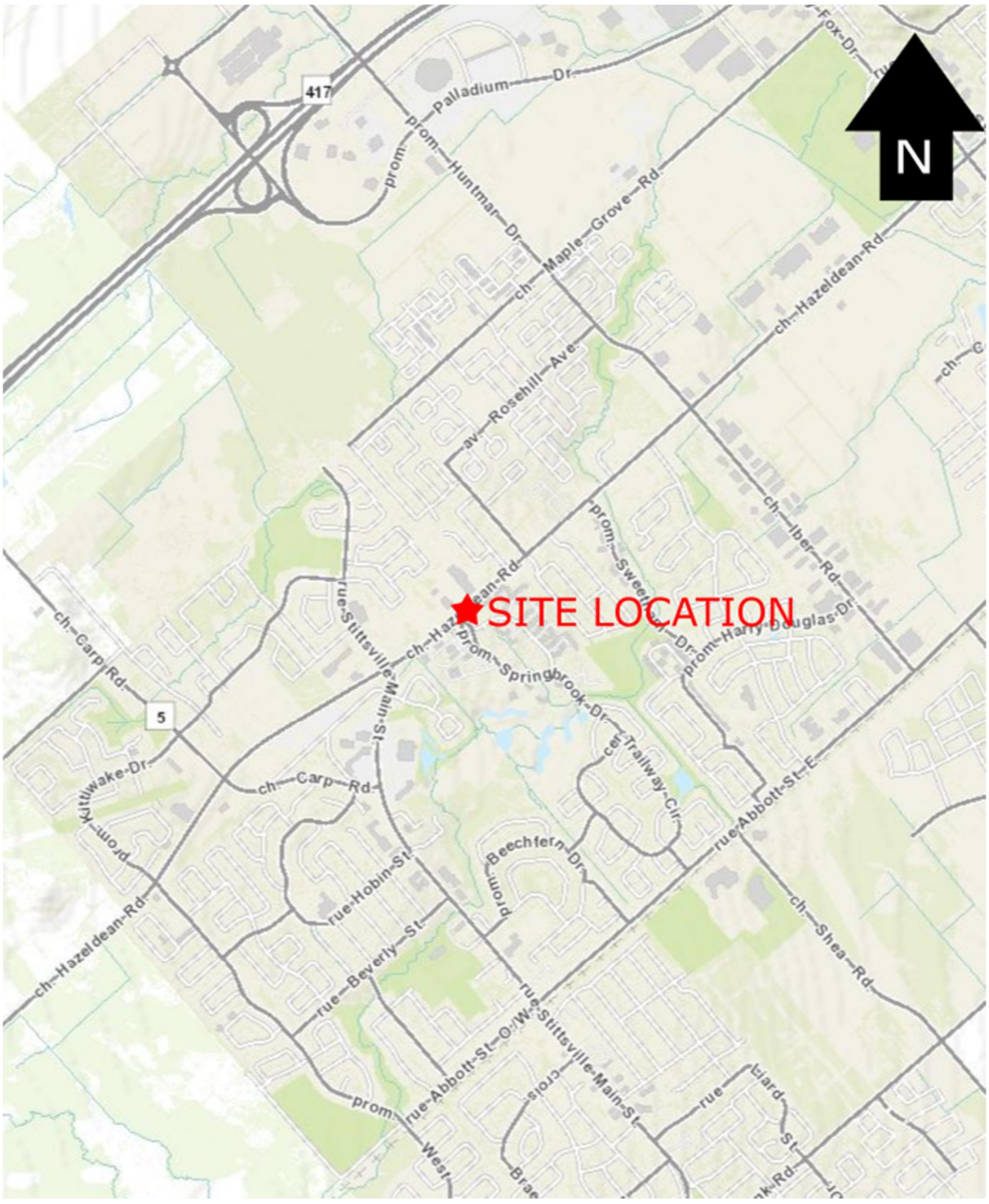
1.5 Summary

Since the development satisfies both the location and safety triggers, the design review will be addressed in the TIA.

The planned development is removing some of the existing land uses, while keeping the Construction Rental business. The total new site is anticipated to generate 20 vehicle trips during the peak hour and less than 30 person trips during the peak hours.

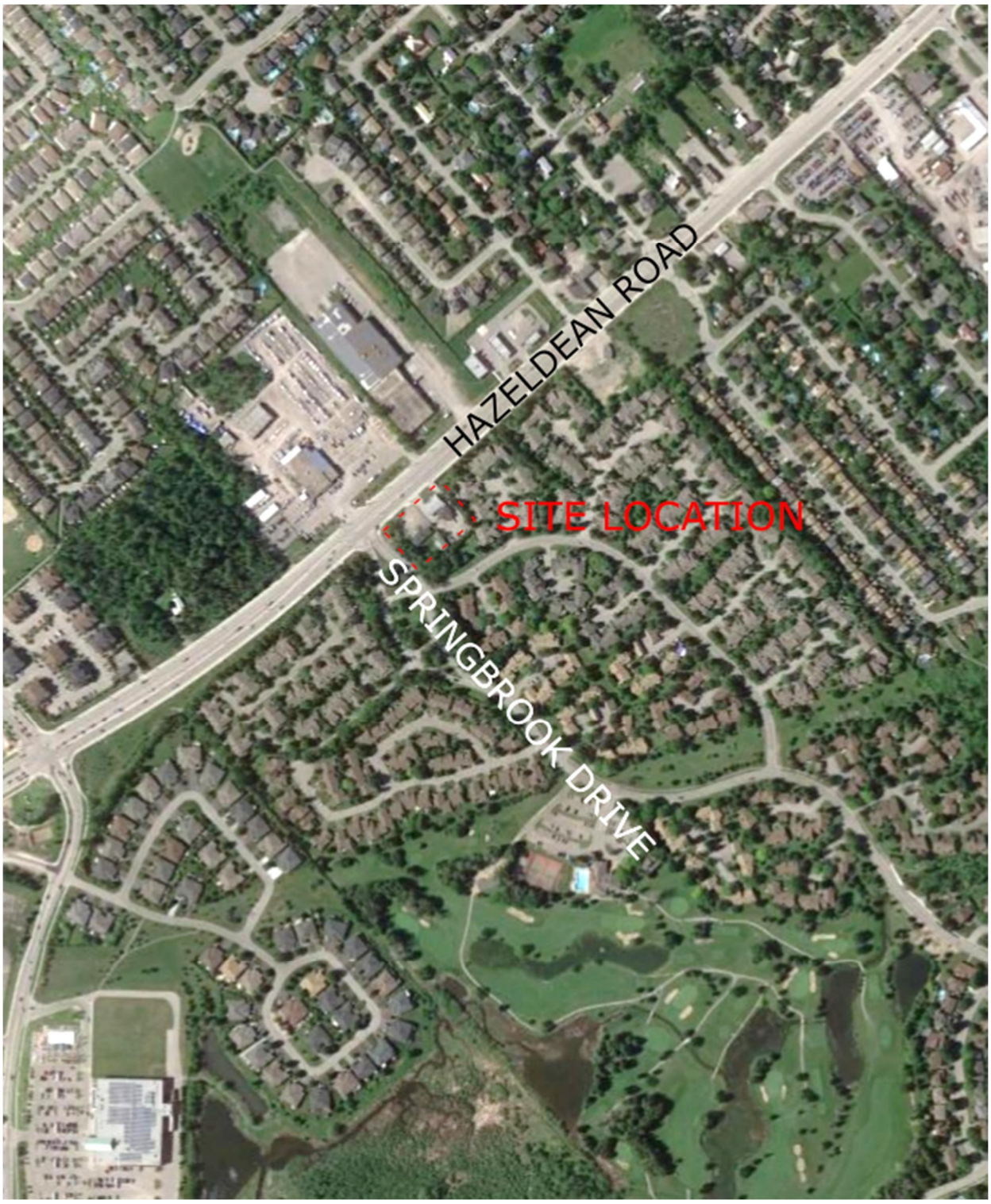
Figure 1 illustrates the site location and Figure 2 shows an aerial view of the site.

Figure 1: Site Location



Source: geoOttawa Accessed 2019-07-23

Figure 2: Aerial View of Site



Source: Google Earth Accessed 2019-07-23

2.0 Scoping

2.1 Existing and Planned Conditions

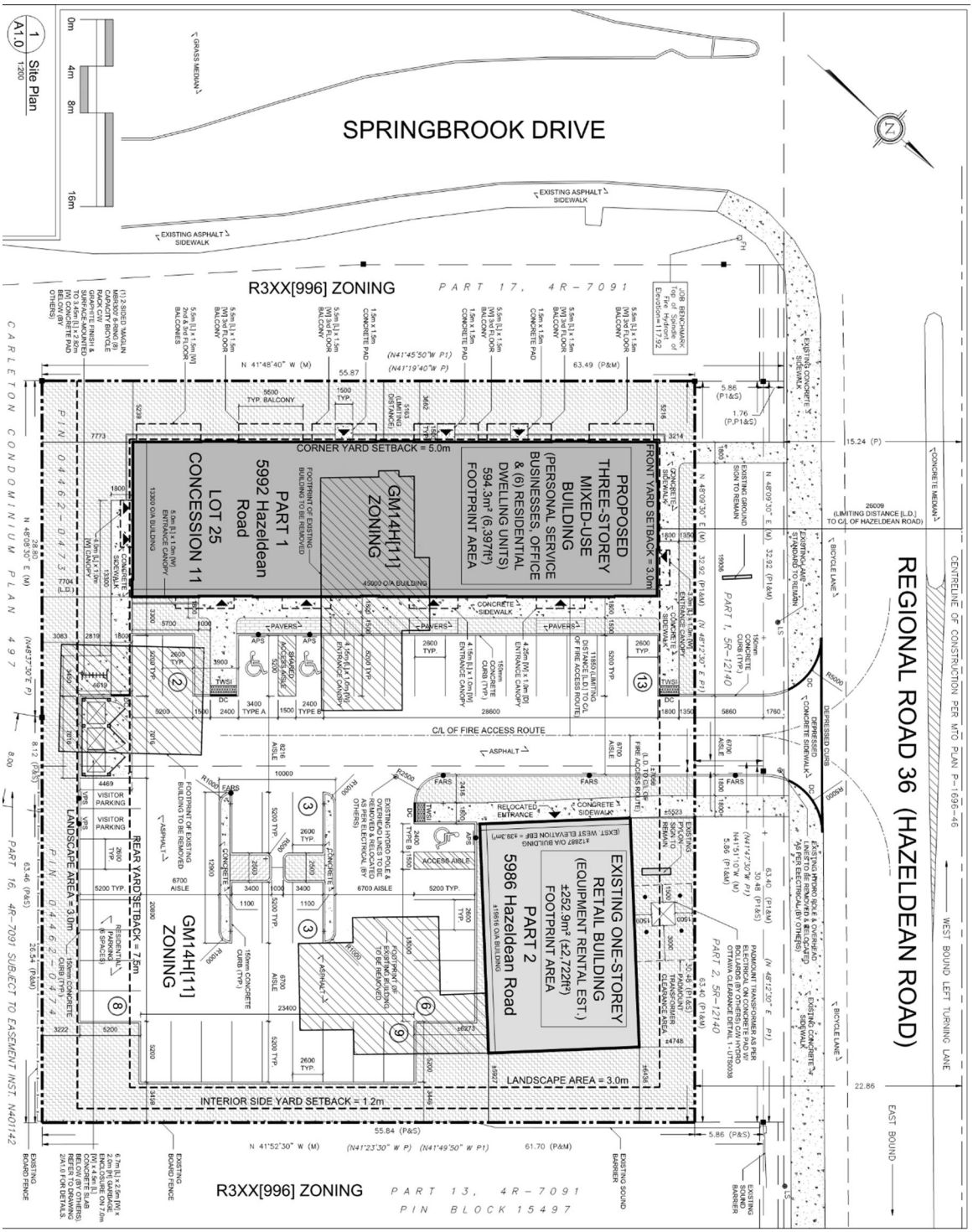
2.1.1 Proposed Development

The proposed site plan application is for a three-storey mixed-use building with a footprint of 594.3 m^2 and 1,782.95 m^2 of gross floor area (over three levels). The proposed new building will have a gross total of 970 m^2 of Personal Services Business and Office space on the first two levels, and six (6) residential units (461.1m^2) on the third level. The project will be built in one phase, with an estimated date of occupancy is 2020.

The existing Rental Village warehouse building will remain but the other buildings and office space on the site will be removed. The site will have 44 surface parking spaces, of which three will be accessible spaces. There will be only one access point, on Hazeldean Road, for all modes of transportation. Figure 3 illustrates the site plan.

The site is currently zoned as GM14 H(11). GM14 is a General Mixed Use Zone which allows for residential, commercial, and institutional uses. GM14 adds among others Personal Business Services as an allowed use.

Figure 3: Site Plan



Source: Argue Construction, 2019-08-29

2.1.2 Existing Conditions

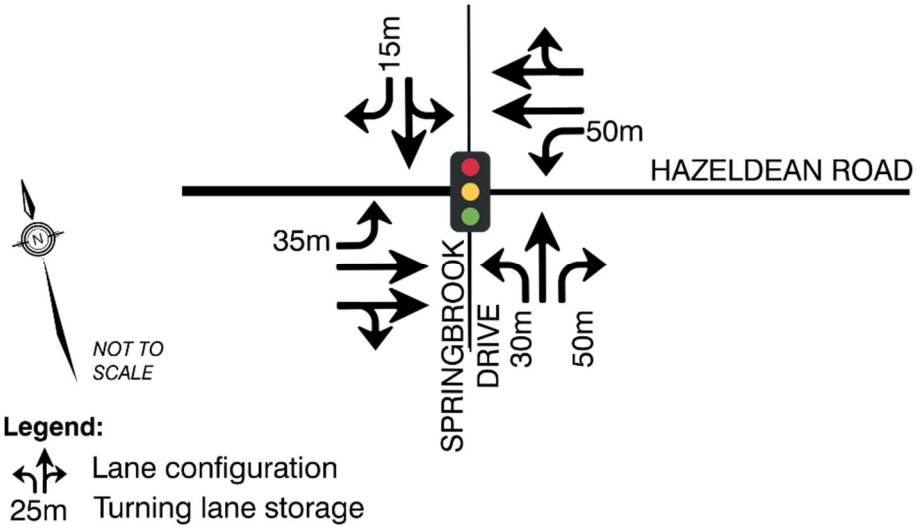
2.1.2.1 Roads and Traffic Control

Hazeldean Road is a municipally-owned four-lane Arterial Main Street with a posted speed limit of 60 km/h. The roadway consists of a four lane cross-section plus auxiliary left turn and on-street cycling lanes in the vicinity of the site.

Springbrook Drive is a municipally-owned two-lane Minor Collector road with a posted speed limit of 40 km/h. Springbrook Drive has a wide grass median as it approaches Hazeldean Road, creating two separate carriageways.

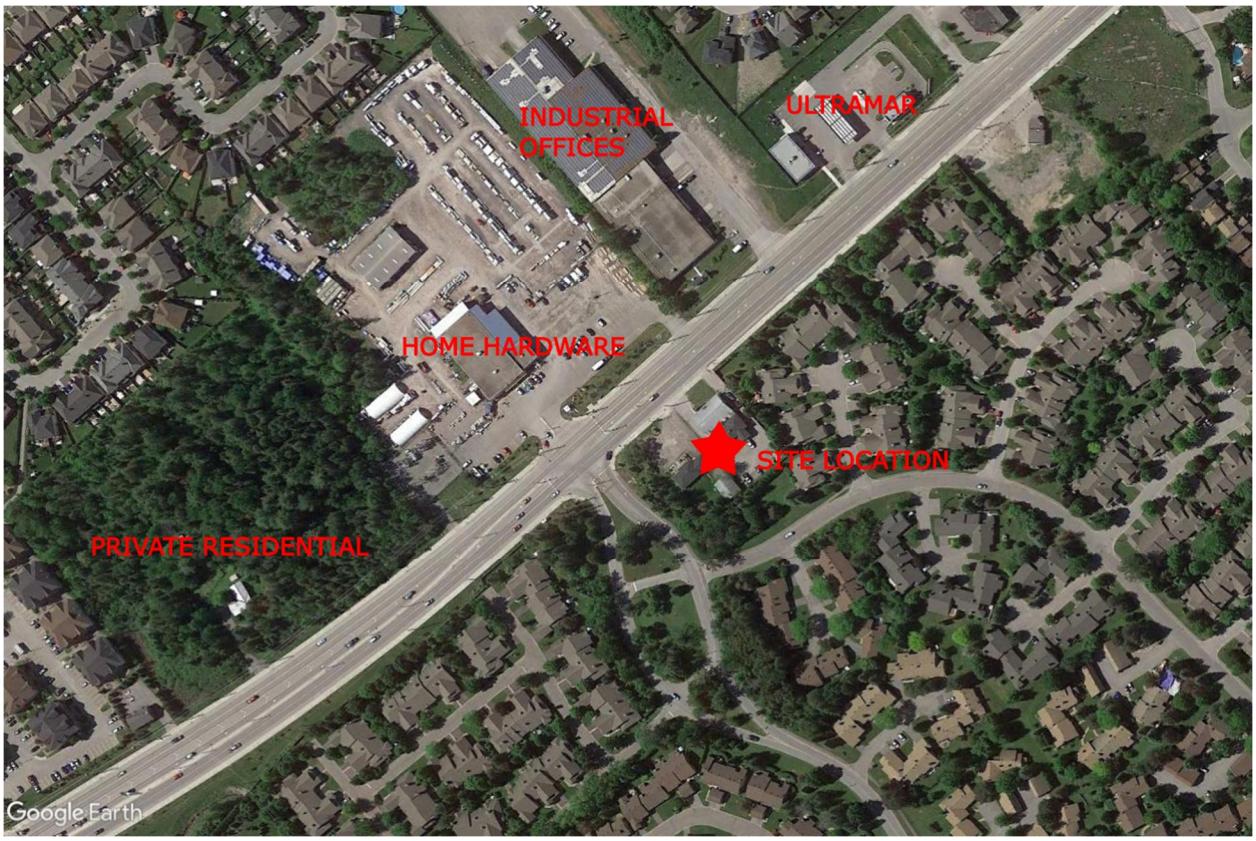
The intersection of Hazeldean Road and Springbrook Drive is a signalized intersection. Figure 4 shows the lane configuration at the intersection.

Figure 4: Lane Geometry – Hazeldean Road /Springbrook Drive Intersection



Multiple commercial driveways and one private residential driveway accesses Hazeldean within 200m of the proposed site as illustrated in Figure 5.

Figure 5: Adjacent Accesses and Land Use



2.1.2.2 Walking and Cycling

There are concrete sidewalks and on-road cycling facilities on both the north and south side of Hazeldean Road. There is an asphalt walkway running along the east side of Springbrook Drive. Figure 6 illustrates the cycling facilities in the area.

2.1.2.3 Transit

During the weekday commuter peak hours, the site is serviced by routes 61 and and 263. Routes 162, 301, and 303 operate during off peak hours.

Table 3 lists the transit routes and the headway, and Figure 7 illustrates the transit routes in the area.

Figure 6: Existing Cycling Network

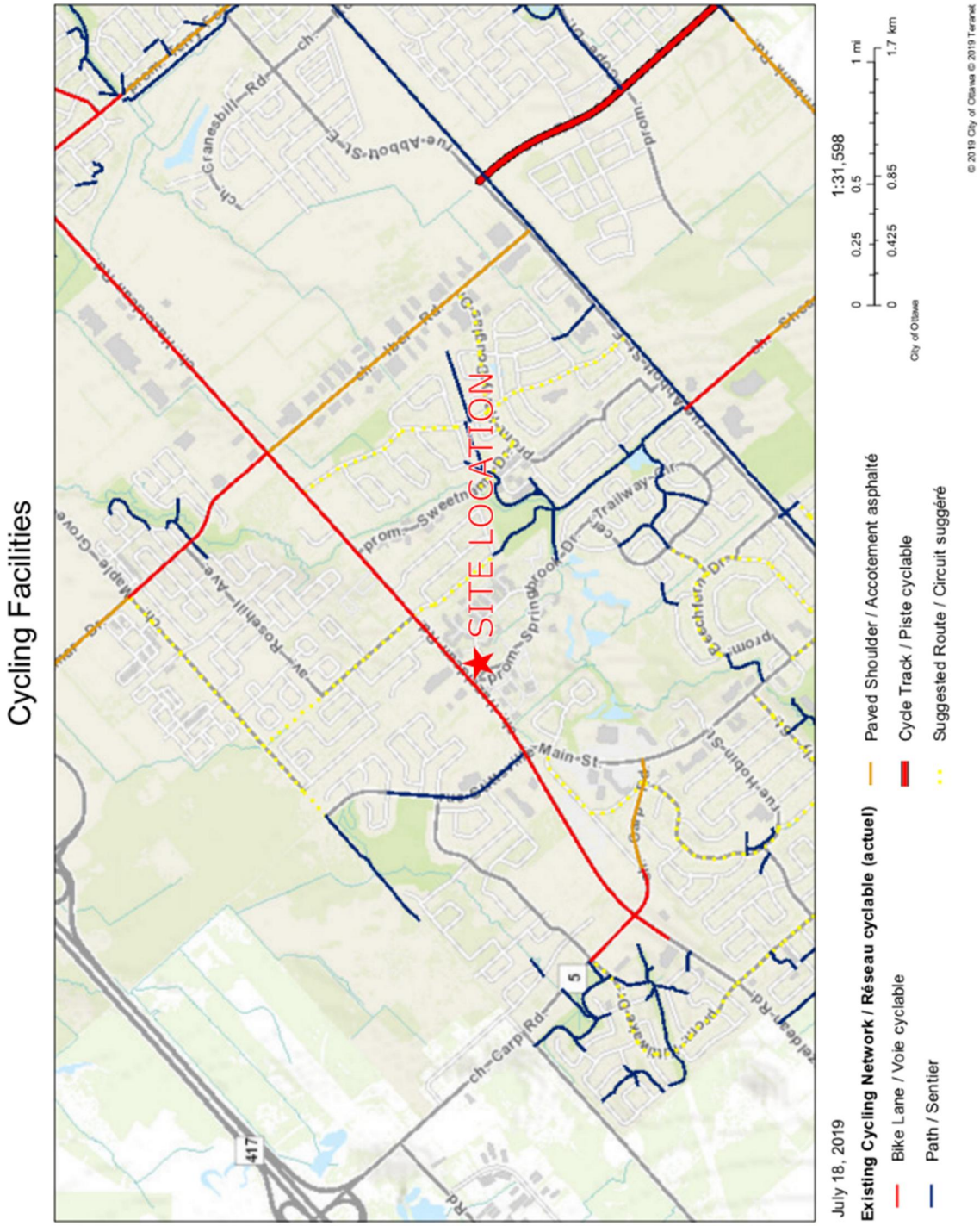


Table 3: Peak Commuter Hour Transit Routes

Route	Headway (Peak Hours)
61 St. Laurent - Hurdman	15 minutes peak direction 30 minutes off-peak direction
263 Express Mackenzie King – Stanley Corners	30 minutes peak direction only
162 Terry Fox - Stittsville	No peak hour service
301 & 303 Carlingwood Shopping	No peak hour service (No Fare Routes)

Figure 7: Existing Transit Service

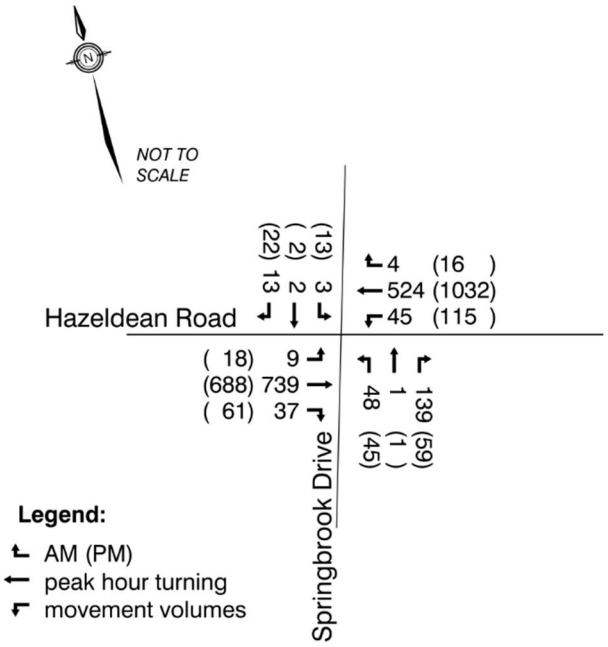
2.1.2.4 Traffic Management

There are no traffic management measures in the study area.

2.1.2.5 Traffic Volumes

Traffic volumes were obtained from the City of Ottawa. Figure 8 illustrates the December 2015 existing traffic volumes at Hazeldean Road and Springbrook Drive.

Figure 8: Existing Traffic Volumes



2.1.2.6 Collision History

From 2014-2017 there were 10 collisions recorded at the intersection of Hazeldean Road and Springbrook Drive:

- nine (9) were property damage only, one had a non-fatal injury;
- eight (8) were in dry conditions, one was in slush, one was on packed snow;
- there were four rear-ends, three turning movements, two SMV (single motor vehicle), and one sideswipe.

East of the Hazeldean and Springbrook Drive intersection, there was one collision in 2014 near the driveway of the proposed site; the collision occurred during poor weather conditions and resulted in property damage only.

2.1.3 Planned Conditions

2.1.3.1 Road and Transit Network Modifications

Hazeldean Road, between Stittsville Main Street and Eagleson Road, has been identified for a Transit Priority Project in the City's Transportation Master Plan (TMP). However, the widening is not included in the 2031 Affordable network concept and therefore the timing of this project is unknown.

2.1.3.2 Walking and Cycling

The City of Ottawa TMP does not identify any walking and cycling changes within the study area.

2.1.3.3 Future Background Developments

The following future developments were identified in the area:

- A car dealership at 5835 Hazeldean Road (east of the site) with a one storey building with inventory parking; and,
- A residential development at 6111 Hazeldean Road (west of the site) expected to add up to 260 vehicles to Hazeldean Road by 2025.

2.2 Study Parameters

2.2.1 Study Area

The study area consists of the intersection of Hazeldean Road and Springbrook Drive, and the site driveway.

2.2.2 Time Periods

AM and PM Peak periods would govern traffic analysis, however the site trip generation is low and does not trigger the Network Impact components.

2.2.3 Horizon Years

Occupancy: 2020

2.3 Exemptions Review

Table 4 presents the exemptions review table from the City of Ottawa's 2017 *Transportation Impact Assessment Guidelines.*

Table 4: Exemptions Review

Module	Element	Exemption Consideration	Status
Design Review Component			
4.1 Development Design	4.1.2 Circulation and Access	Only required for site plans	Included
	4.1.3 New Street Networks	Only required for plans of subdivision	Excluded
4.2 Parking	4.2.1 Parking Supply	Only required for site plans	Included
	4.2.2 Spillover Parking	Only required for site plans where parking supply is 15% below unconstrained demand	Exempt
Network Impact Component			
4.5 Transportation Demand Management	All Elements	Not required for non-residential site plans expected to have fewer than 60 employees and/or students on location at any given time	Exempt
4.6 Neighbourhood Traffic Management	4.6.1 Adjacent Neighbourhoods	Only required when the development relies on Local or Collector streets for access and total volumes exceed ATM capacity thresholds	Exempt
4.8 Network Concept		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	Exempt
4.9 Intersection Design	All Elements	Not required if site generation trigger is not met	Exempt

3.0 Forecasting

3.1 Development-generated Travel Demand

Exempt, also see Section 1.2.

3.2 Background Network Travel Demands

3.2.1 Transportation Network Plans

The Hazeldean Road corridor has been identified in the TMP for future transit improvements. These improvements will focus on intersection improvements such as transit priority signals.

3.2.2 Background Growth

Background growth is assumed to be 2% based on typical city growth rates.

3.2.3 Other developments

The following future developments were identified in the area:

- A car dealership at 5835 Hazeldean Road (east of the site) with a one storey building with inventory parking; and,
- A residential development at 6111 Hazeldean Road (west of the site) expected to add up to 260 vehicles to Hazeldean Road by 2025.

3.3 Demand Rationalization

Exempt.

4.0 Analysis

4.1 Development Design

4.1.1 Design for Sustainable Modes

The proposed development consists of a single 3-story mixed use building with access on Hazeldean Road. All of the required TDM – Supportive Development Design and Infrastructure Checklist required items and many of the other items that relate to the site plan are met, while some of the items of the checklist are not relevant for the site. The following are some of the other items that are included within the site design:

- The building is mixed use with both office space and residential units;
- The building is located closer to Hazeldean road, with no parking in-between the road and the building; and
- The site will feature the exact amount of parking required by the by-law.

Appendix C contains the TDM-supportive Development Design and Infrastructure checklist.

4.1.2 Circulation and Access

Guest parking, loading zones, and short-stay deliveries will be accommodated on-site. Two parking spots are dedicated visitor parking for the residential units. All access is from Hazeldean Road.

The proposed site driveway is located on the existing driveway location, located approximately 30m from the westbound stop bar on Hazeldean Road. The owner has consulted with adjacent neighbours seeking a driveway to the south of the site to Old Orchard Crescent, a local roadway. An access agreement was unable to be reached.

4.1.3 New Street Networks

Exempt, no new streets.

4.2 Parking

4.2.1 Parking Supply

4.2.1.1 Auto Parking

Parking requirements are broken down in Table 5 which shows a total requirement of 44 spaces needed for the site. The parking supply meets the zoning requirements.

Table 5: Parking Requirements

Use Type	Bylaw Specification	Parking Required
Personal Business Service	3.4 spaces / 100m^2 GFA	15
Office	2.4 spaces / 100m^2 GFA	12
Residential	1 space / unit	6
Residential Visitor	0.2 spaces / unit	2
Existing Retail	3.4 spaces / 100m^2 GFA	9
Total		44

4.2.1.2 Bicycle Parking

Bicycle parking will be provided by an outdoor bike rack with 8 spaces.

4.2.2 Spillover Parking

Exempted, parking supply meets parking demand.

4.3 Boundary Street Design

The Hazeldean Road existing site access provides full movements.

Hazelden Road midblock provides two eastbound and two westbound lanes with a centre left turn lane. On street cycling lanes are provided. Concrete sidewalks are provided on both the north and south sides of the roadway.

Table 6 summarizes the results of Multi-Modal Levels of Service (MMLOS) analysis for segments (i.e. between signalized intersections). Pedestrian levels of service suffers primarily from the 60km/h posted speed limit on Hazeldean Road. Cycling benefits from

the presence of bike lanes along Hazeldean Road, but is impacted by the traffic operating speed.

Target Levels of Service were obtained taken from of the City of Ottawa MMLOS Guidelines, Exhibit 22.

Hazeldean Road has been identified for future transit measures applicable to intersections which has no impact on the Segment MMLOS score presented.

Table 6: MMLOS Analysis – Hazeldean Road, Roadway Segment

	Criteria	Target	Hazeldean Road
Pedestrian LOS	Sidewalk width	C	2.0m
	Boulevard width		0m
	AADT > 3000?		Yes
	On-Street Parking		No
	Operating Speed		>60 km/h
	Level of Service		F
Cycling LOS	Type of facility	C	Bike Lanes
	Number of travel lanes		4, with median
	Bike lane width		>1.8m
	Operating speed		>60 km/h
	Centreline (yes/no)		yes
	Bike lane blockage freq.		Rare
	Level of Service		C
Transit LOS	Type of facility	D	Mixed traffic
	Parking/driveway friction		Moderate
	Level of Service		E
Truck LOS	Number of lanes	D	2
	Lane width		3.4m - 3.5m
	Level of Service		A

4.4 Access Intersections Design

4.4.1 Location and Design of Access

The site plan proposes to reduce the number of accesses from two driveways to one on Hazeldean Road. This driveway will be stop controlled for the minor approach (vehicles leaving the site), providing a full movement access.

The proposed driveway location is consistent with the existing site access location. The driveway is located 30 metres upstream of the westbound Hazeldean Road stop bar, and is located within the westbound left turn lane to Springbrook Drive.

Westbound left turns into the site can be accommodated by existing road geometry. No modifications are proposed to Hazeldean Road.

4.4.2 Intersection Control

The anticipated traffic volumes at the proposed site driveways warrant single lane approaches with Stop control in advance of the public sidewalks, consistent with the Highway Traffic Act. Traffic signage is not required.

4.4.3 Intersection Design

The access intersection will be stop controlled and therefore an MMLOS evaluation has not been undertaken at the driveways.

4.5 Transportation Demand Management

Exempted in Scoping and Screening.

4.6 Neighbourhood Traffic Management

Exempted in Scoping and Screening.

4.7 Transit

Exempted in Scoping and Screening.

4.8 Review of Network Concept

Exempted in Scoping and Screening.

4.9 Intersection Design

Exempted in Scoping and Screening.

5.0 Conclusions

The site plan development proposed for 5986-5992 Hazeldean Road redevelops a portion of the site while maintaining the existing Construction Rental business. The new development is to include office, personal services business space and six new apartments. The total site will generate approximately 20 vehicle trips during the peak hours. The existing three site driveway are to be consolidated into a single driveway location in an existing location, approximately 30 metres from the Springbrook Drive intersection.

Operations at the existing driveway were monitored as part of the study, and staff at the existing office were interview. No operational problems were observed while the intersection and driveway were being monitored, and staff confirmed they have had no issues using the driveway.

The site plan has included all of the required TDM features and some of the other desired features. It is anticipated that the development will have very little impact and will operate similar to the existing conditions.

No network or adjacent roadway modifications are recommended to accommodate the proposed site plan.

Appendix A

TRANS Vehicle Trip Generation Tables

Table 6.1: Vehicle Trip Generation Rates

Vehicle Trip Generation Rates AM and PM Peak Hours						
ITE Land Use Code	Dwelling Unit Type / Data Source		Vehicle Trip Generation Rate			
			2008 Count Data	ITE	OD Survey	Blended Rate
210	Single-detached dwellings	AM	0.66	0.75	0.56	0.66
		PM	0.89	1.01	0.53	0.81
224	Semi-detached dwellings, townhouses, rowhouses	AM	0.40	0.70	0.46	0.52
		PM	0.64	0.72	0.46	0.61
231	Low-rise condominiums (1 or 2 floors)	AM	0.53	0.67	0.21	0.47
		PM	0.41	0.78	0.18	0.46
232	High-rise condominiums (3+ floors)	AM	0.53	0.34	0.21	0.36
		PM	0.41	0.38	0.18	0.32
233	Luxury condominiums	AM	0.53	0.56	0.21	0.43
		PM	0.41	0.55	0.18	0.38
221	Low-rise apartments (2 floors)	AM	0.19	0.46	0.21	0.29
		PM	0.21	0.58	0.18	0.32
223	Mid-rise apartments (3-10 floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.39	0.18	0.26
222	High-rise apartments (10+ floors)	AM	0.19	0.30	0.21	0.23
		PM	0.21	0.35	0.18	0.25

Table 6.2: Recommended Vehicle Trip Directional Splits

Comparison of Directional Splits (Inbound/Outbound) AM and PM Peak Hours								
ITE Land Use Code	Area Dwelling Unit Type / Data Source		2008 Count Data		ITE		Blended Rate	
			Inbound	Outbound	Inbound	Outbound	Inbound	Outbound
210	Single-detached dwellings	AM	33%	67%	25%	75%	29%	71%
		PM	60%	40%	63%	37%	62%	39%
224	Semi-detached dwellings, townhouses, rowhouses	AM	40%	60%	33%	67%	37%	64%
		PM	55%	45%	51%	49%	53%	47%
231	Low-rise condominiums (1 or 2 floors)	AM	36%	64%	25%	75%	31%	70%
		PM	54%	46%	58%	42%	56%	44%
232	High-rise condominiums (3+ floors)	AM	36%	64%	19%	81%	28%	73%
		PM	54%	46%	62%	38%	58%	42%
233	Luxury condominiums	AM	36%	64%	23%	77%	30%	71%
		PM	54%	46%	63%	37%	59%	42%
221	Low-rise apartments (2 floors)	AM	22%	78%	21%	79%	22%	79%
		PM	62%	38%	65%	35%	64%	37%
223	Mid-rise apartments (3-10 floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%
222	High-rise apartments (10+ floors)	AM	22%	78%	25%	75%	24%	77%
		PM	62%	38%	61%	39%	62%	39%

Appendix B

Kanata/Stittsville OD Survey

Kanata - Stittsville

Demographic Characteristics

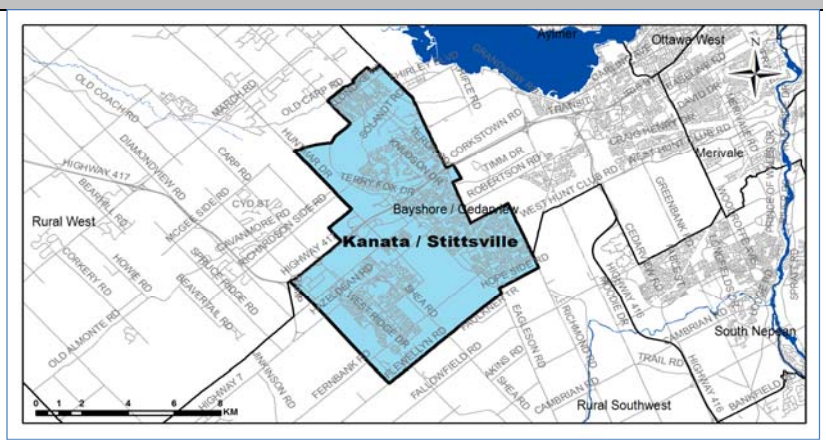
Population	105,210	Actively Travelled	83,460
Employed Population	49,640	Number of Vehicles	64,540
Households	38,010	Area (km^2)	82.6

Occupation

Status (age 5+)	Male	Female	Total
Full Time Employed	24,670	19,590	44,260
Part Time Employed	1,540	3,840	5,380
Student	13,630	13,410	27,040
Retiree	6,480	8,350	14,820
Unemployed	850	940	1,790
Homemaker	160	3,310	3,470
Other	350	1,010	1,360
Total:	47,690	50,440	98,120

Traveller Characteristics	Male	Female	Total
Transit Pass Holders	5,940	6,920	12,860
Licensed Drivers	36,280	36,790	73,070
Telecommuters	200	380	580
Trips made by residents	135,300	143,330	278,630

Selected Indicators	
Daily Trips per Person (age 5+)	2.84
Vehicles per Person	0.61
Number of Persons per Household	2.77
Daily Trips per Household	7.33
Vehicles per Household	1.70
Workers per Household	1.31
Population Density (Pop/km2)	1270

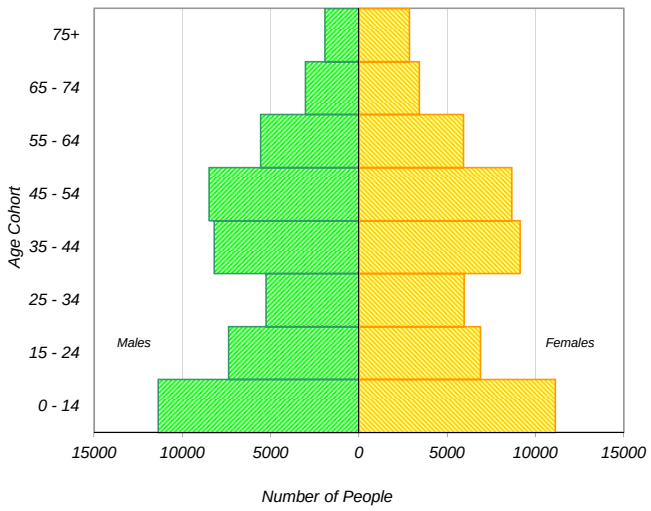


Household Size		
1 person	5,810	15%
2 persons	11,660	31%
3 persons	7,490	20%
4 persons	8,890	23%
5+ persons	4,160	11%
Total:	38,010	100%

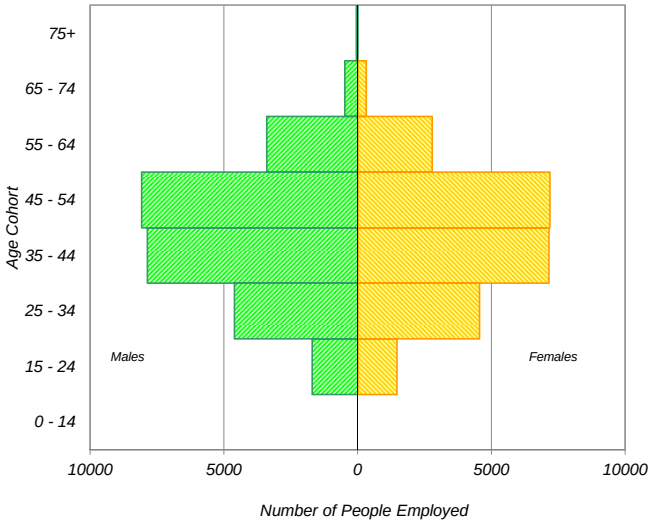
Households by Vehicle Availability		
0 vehicles	1,050	3%
1 vehicle	14,090	37%
2 vehicles	19,110	50%
3 vehicles	3,000	8%
4+ vehicles	770	2%
Total:	38,010	100%

Households by Dwelling Type		
Single-detached	21,610	57%
Semi-detached	3,890	10%
Townhouse	10,550	28%
Apartment/Condo	1,960	5%
Total:	38,010	100%

Population



Employed Population

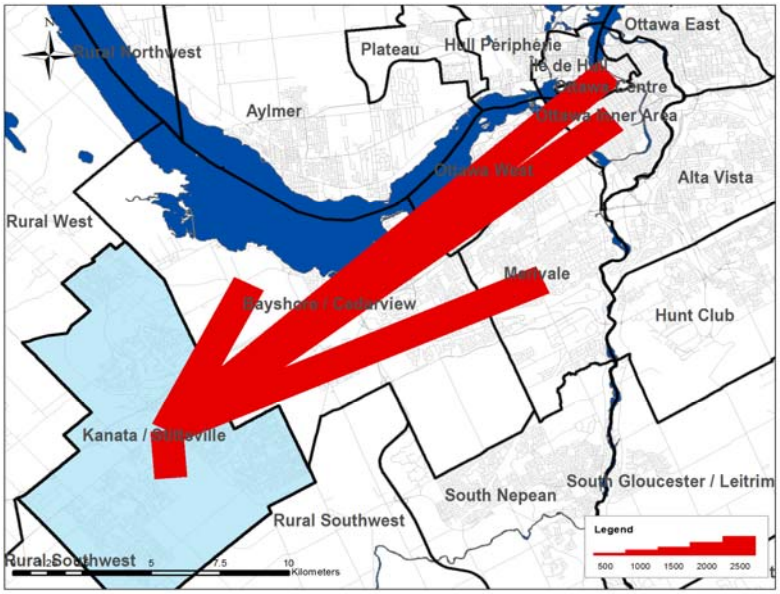


* In 2005 data was only collected for household members aged 11+ therefore these results cannot be compared to the 2011 data.

Travel Patterns

Top Five Destinations of Trips from Kanata - Stittsville

AM Peak Period



Summary of Trips to and from Kanata - Stittsville

AM Peak Period (6:30 - 8:59)	Destinations of Trips From District	% Total	Origins of Trips To District	% Total
Districts				
Ottawa Centre	4,560	8%	140	0%
Ottawa Inner Area	3,350	6%	970	2%
Ottawa East	660	1%	260	1%
Beacon Hill	280	0%	170	0%
Alta Vista	1,810	3%	660	1%
Hunt Club	490	1%	420	1%
Merivale	3,410	6%	1,200	3%
Ottawa West	2,020	4%	840	2%
Bayshore / Cedarview	5,010	9%	2,420	5%
Orléans	290	1%	500	1%
Rural East	100	0%	30	0%
Rural Southeast	50	0%	260	1%
South Gloucester / Leitrim	60	0%	140	0%
South Nepean	690	1%	1,800	4%
Rural Southwest	1,130	2%	1,850	4%
Kanata / Stittsvile	30,360	54%	30,360	66%
Rural West	1,050	2%	3,250	7%
Île de Hull	670	1%	30	0%
Hull Périphérie	160	0%	30	0%
Plateau	100	0%	230	0%
Aylmer	0	0%	190	0%
Rural Northwest	20	0%	60	0%
Pointe Gatineau	20	0%	80	0%
Gatineau Est	0	0%	60	0%
Rural Northeast	30	0%	50	0%
Buckingham / Masson-Angers	30	0%	10	0%
Ontario Sub-Total:	55,320	98%	45,270	98%
Québec Sub-Total:	1,030	2%	740	2%
Total:	56,350	100%	46,010	100%

Trips by Trip Purpose

24 Hours	From District		To District		Within District	
Work or related	27,180	29%	17,020	18%	14,550	9%
School	7,070	7%	2,500	3%	15,110	9%
Shopping	6,070	6%	9,150	10%	22,480	14%
Leisure	8,450	9%	10,590	11%	17,090	11%
Medical	2,520	3%	1,170	1%	2,660	2%
Pick-up / drive passenger	6,570	7%	5,470	6%	15,190	9%
Return Home	33,610	35%	45,620	48%	65,770	41%
Other	3,560	4%	3,590	4%	8,440	5%
Total:	95,030	100%	95,110	100%	161,290	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Work or related	18,030	69%	11,020	70%	7,430	24%
School	4,890	19%	2,280	15%	11,740	39%
Shopping	170	1%	320	2%	760	3%
Leisure	340	1%	400	3%	780	3%
Medical	330	1%	230	1%	350	1%
Pick-up / drive passenger	1,260	5%	580	4%	4,760	16%
Return Home	290	1%	380	2%	1,980	7%
Other	670	3%	430	3%	2,560	8%
Total:	25,980	100%	15,640	100%	30,360	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Work or related	390	2%	350	1%	930	2%
School	370	2%	0	0%	90	0%
Shopping	1,030	5%	1,910	7%	5,100	14%
Leisure	2,140	11%	3,080	11%	4,130	11%
Medical	230	1%	180	1%	400	1%
Pick-up / drive passenger	1,980	10%	1,980	7%	3,410	9%
Return Home	12,130	64%	20,550	71%	21,560	58%
Other	680	4%	860	3%	1,850	5%
Total:	18,950	100%	28,910	100%	37,470	100%

Peak Period (%)	Total:	% of 24 Hours	Within District (%)
24 Hours	351,430		46%
AM Peak Period	71,980	20%	42%
PM Peak Period	85,330	24%	44%

Trips by Primary Travel Mode

24 Hours	From District		To District		Within District	
Auto Driver	63,470	67%	63,830	67%	92,190	57%
Auto Passenger	15,220	16%	14,920	16%	31,880	20%
Transit	12,200	13%	12,270	13%	4,050	3%
Bicycle	360	0%	410	0%	960	1%
Walk	40	0%	50	0%	21,080	13%
Other	3,730	4%	3,660	4%	11,130	7%
Total:	95,020	100%	95,140	100%	161,290	100%

AM Peak (06:30 - 08:59)	From District		To District		Within District	
Auto Driver	15,360	59%	11,530	74%	13,630	45%
Auto Passenger	2,450	9%	1,160	7%	5,050	17%
Transit	6,230	24%	1,290	8%	1,210	4%
Bicycle	30	0%	80	1%	220	1%
Walk	0	0%	40	0%	5,730	19%
Other	1,900	7%	1,560	10%	4,510	15%
Total:	25,970	100%	15,660	100%	30,350	100%

PM Peak (15:30 - 17:59)	From District		To District		Within District	
Auto Driver	13,850	73%	17,660	61%	21,240	57%
Auto Passenger	3,240	17%	4,270	15%	8,570	23%
Transit	1,270	7%	5,980	21%	670	2%
Bicycle	40	0%	100	0%	260	1%
Walk	40	0%	0	0%	4,570	12%
Other	520	3%	910	3%	2,160	6%
Total:	18,960	100%	28,920	100%	37,470	100%

Avg Vehicle Occupancy	From District	To District	Within District
24 Hours	1.24	1.23	1.35
AM Peak Period	1.16	1.10	1.37
PM Peak Period	1.23	1.24	1.40

Transit Modal Split	From District	To District	Within District
24 Hours	13%	13%	3%
AM Peak Period	26%	9%	6%
PM Peak Period	7%	21%	2%

Appendix C

TDM Checklist

TDM-Supportive Development Design and Infrastructure Checklist:
Non-Residential Developments (office, institutional, retail or industrial)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐ N.A.
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met), plus the expected peak number of customer/visitor cyclists	☐
BETTER	2.1.5	Provide bicycle parking spaces equivalent to the expected number of commuter and customer/visitor cyclists, plus an additional buffer (e.g. 25 percent extra) to encourage other cyclists and ensure adequate capacity in peak cycling season	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single office building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ Exempt
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to the expected number of commuter cyclists (assuming the cycling mode share target is met)	☐
	2.3	**Shower & change facilities**	
BASIC	2.3.1	Provide shower and change facilities for the use of active commuters	☐
BETTER	2.3.2	In addition to shower and change facilities, provide dedicated lockers, grooming stations, drying racks and laundry facilities for the use of active commuters	☐
	2.4	**Bicycle repair station**	
BETTER	2.4.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐

		TDM-supportive design & infrastructure measures: *Non-residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐ N.A.
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐ N.A.
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	4.2	**Carpool parking**	
BASIC	4.2.1	Provide signed parking spaces for carpools in a priority location close to a major building entrance, sufficient in number to accommodate the mode share target for carpools	☐
BETTER	4.2.2	At large developments, provide spaces for carpools in a separate, access-controlled parking area to simplify enforcement	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide carshare parking spaces in permitted non-residential zones, occupying either required or provided parking spaces *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐

	TDM-supportive design & infrastructure measures: *Non-residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Separate short-term and long-term parking areas using signage or physical barriers, to permit access controls and simplify enforcement (i.e. to discourage employees from parking in visitor spaces, and vice versa)	☐
	7.	**OTHER**	
	7.1	**On-site amenities to minimize off-site trips**	
BETTER	7.1.1	Provide on-site amenities to minimize mid-day or mid-commute errands	☐

TDM-Supportive Development Design and Infrastructure Checklist:
Residential Developments (multi-family or condominium)

Legend

REQUIRED	The Official Plan or Zoning By-law provides related guidance that must be followed
BASIC	The measure is generally feasible and effective, and in most cases would benefit the development and its users
BETTER	The measure could maximize support for users of sustainable modes, and optimize development performance

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	1.	**WALKING & CYCLING: ROUTES**	
	1.1	**Building location & access points**	
BASIC	1.1.1	Locate building close to the street, and do not locate parking areas between the street and building entrances	☑
BASIC	1.1.2	Locate building entrances in order to minimize walking distances to sidewalks and transit stops/stations	☑
BASIC	1.1.3	Locate building doors and windows to ensure visibility of pedestrians from the building, for their security and comfort	☑
	1.2	**Facilities for walking & cycling**	
REQUIRED	1.2.1	Provide convenient, direct access to stations or major stops along rapid transit routes within 600 metres; minimize walking distances from buildings to rapid transit; provide pedestrian-friendly, weather-protected (where possible) environment between rapid transit accesses and building entrances; ensure quality linkages from sidewalks through building entrances to integrated stops/stations *(see Official Plan policy 4.3.3)*	☑
REQUIRED	1.2.2	Provide safe, direct and attractive pedestrian access from public sidewalks to building entrances through such measures as: reducing distances between public sidewalks and major building entrances; providing walkways from public streets to major building entrances; within a site, providing walkways along the front of adjoining buildings, between adjacent buildings, and connecting areas where people may congregate, such as courtyards and transit stops; and providing weather protection through canopies, colonnades, and other design elements wherever possible *(see Official Plan policy 4.3.12)*	☑

	TDM-supportive design & infrastructure measures: *Residential developments*		Check if completed & add descriptions, explanations or plan/drawing references
REQUIRED	1.2.3	Provide sidewalks of smooth, well-drained walking surfaces of contrasting materials or treatments to differentiate pedestrian areas from vehicle areas, and provide marked pedestrian crosswalks at intersection sidewalks *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.4	Make sidewalks and open space areas easily accessible through features such as gradual grade transition, depressed curbs at street corners and convenient access to extra-wide parking spaces and ramps *(see Official Plan policy 4.3.10)*	☑
REQUIRED	1.2.5	Include adequately spaced inter-block/street cycling and pedestrian connections to facilitate travel by active transportation. Provide links to the existing or planned network of public sidewalks, multi-use pathways and on-road cycle routes. Where public sidewalks and multi-use pathways intersect with roads, consider providing traffic control devices to give priority to cyclists and pedestrians *(see Official Plan policy 4.3.11)*	☑
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	☑
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	☑
BASIC	1.2.8	Design roads used for access or circulation by cyclists using a target operating speed of no more than 30 km/h, or provide a separated cycling facility	☐
	1.3	**Amenities for walking & cycling**	
BASIC	1.3.1	Provide lighting, landscaping and benches along walking and cycling routes between building entrances and streets, sidewalks and trails	☐
BASIC	1.3.2	Provide wayfinding signage for site access (where required, e.g. when multiple buildings or entrances exist) and egress (where warranted, such as when directions to reach transit stops/stations, trails or other common destinations are not obvious)	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	2.	**WALKING & CYCLING: END-OF-TRIP FACILITIES**	
	2.1	**Bicycle parking**	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible *(see Official Plan policy 4.3.6)*	☑
REQUIRED	2.1.2	Provide the number of bicycle parking spaces specified for various land uses in different parts of Ottawa; provide convenient access to main entrances or well-used areas *(see Zoning By-law Section 111)*	☑
REQUIRED	2.1.3	Ensure that bicycle parking spaces and access aisles meet minimum dimensions; that no more than 50% of spaces are vertical spaces; and that parking racks are securely anchored *(see Zoning By-law Section 111)*	☑
BASIC	2.1.4	Provide bicycle parking spaces equivalent to the expected number of resident-owned bicycles, plus the expected peak number of visitor cyclists	☐
	2.2	**Secure bicycle parking**	
REQUIRED	2.2.1	Where more than 50 bicycle parking spaces are provided for a single residential building, locate at least 25% of spaces within a building/structure, a secure area (e.g. supervised parking lot or enclosure) or bicycle lockers *(see Zoning By-law Section 111)*	☐ Exempt
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi-family residential developments	☒
	2.3	**Bicycle repair station**	
BETTER	2.3.1	Provide a permanent bike repair station, with commonly used tools and an air pump, adjacent to the main bicycle parking area (or secure bicycle parking area, if provided)	☐
	3.	**TRANSIT**	
	3.1	**Customer amenities**	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	☐
BASIC	3.1.2	Where the site abuts an off-site transit stop and insufficient space exists for a transit shelter in the public right-of-way, protect land for a shelter and/or install a shelter	☐
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	☐

		TDM-supportive design & infrastructure measures: *Residential developments*	Check if completed & add descriptions, explanations or plan/drawing references
	4.	**RIDESHARING**	
	4.1	**Pick-up & drop-off facilities**	
BASIC	4.1.1	Provide a designated area for carpool drivers (plus taxis and ride-hailing services) to drop off or pick up passengers without using fire lanes or other no-stopping zones	☐
	5.	**CARSHARING & BIKESHARING**	
	5.1	**Carshare parking spaces**	
BETTER	5.1.1	Provide up to three carshare parking spaces in an R3, R4 or R5 Zone for specified residential uses *(see Zoning By-law Section 94)*	☐
	5.2	**Bikeshare station location**	
BETTER	5.2.1	Provide a designated bikeshare station area near a major building entrance, preferably lighted and sheltered with a direct walkway connection	☐
	6.	**PARKING**	
	6.1	**Number of parking spaces**	
REQUIRED	6.1.1	Do not provide more parking than permitted by zoning, nor less than required by zoning, unless a variance is being applied for	☑
BASIC	6.1.2	Provide parking for long-term and short-term users that is consistent with mode share targets, considering the potential for visitors to use off-site public parking	☐
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly *(see Zoning By-law Section 104)*	☐
BETTER	6.1.4	Reduce the minimum number of parking spaces required by zoning by one space for each 13 square metres of gross floor area provided as shower rooms, change rooms, locker rooms and other facilities for cyclists in conjunction with bicycle parking *(see Zoning By-law Section 111)*	☐
	6.2	**Separate long-term & short-term parking areas**	
BETTER	6.2.1	Provide separate areas for short-term and long-term parking (using signage or physical barriers) to permit access controls and simplify enforcement (i.e. to discourage residents from parking in visitor spaces, and vice versa)	☐