#### Memo

# **ARCADIS**

SUBJECT 155 Dun Skipper Drive Transportation Impact Assessment Addendum #1 DATE December 12, 2024

DEPARTMENT Transportation Engineering

COPIES TO

**TO** Mr. Omkar Atwal

OUR REF \148290 155 Dun Skipper Road - Internal Documents\6.0\_Technical\6.23\_Traffic\03\_Reports PROJECT NUMBER 148290

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In 2019, a Transportation Impact Assessment (TIA) was prepared by IBI Group (now part of Arcadis) in support of a Zoning By-law Amendment (ZBLA) application for the 155 Dun Skipper Drive (formerly 4836 Bank Street) development. At the time that the original TIA was prepared, the concept for the proposed development included a hardware store (now constructed), hotel, restaurant, and a commercial building.

The site plan has since been revised and the hotel building has been replaced with a proposed nine-storey mixeduse seniors apartment building. Trip generation estimates indicate that the proposed change in land use will result in a nominal increase of up to only three (3) two-way vehicle trips for the site during the weekday morning peak hour, and a reduction during the weekday afternoon peak hour. Given the low magnitude of this increase, the network impacts evaluated in the TIA will remain unchanged. This addendum to the TIA has been prepared to summarize any localized impacts of the proposed land use changes.

The following topics have been discussed as part of this addendum:

- 1. Land uses
- 2. Trip generation estimates
- 3. Swept path analysis
- 4. Parking review
- 5. Transportation demand management (TDM)

### **Proposed Development**

Table 1 summarizes the land uses included in the previous version of the site plan, as evaluated in the 2019 TIA.

Table 1 Previous Land Uses

Building	Land Use	Size
Building 'A' <sup>1</sup>	Hardware Store (incl. Drive-Thru Shed)	2,997 m <sup>2</sup>
Building 'B'	Hotel	Approximately 125 rooms
Building 'C'	Restaurant (incl. Drive-Thru Facility)	502 m <sup>2</sup>
Building 'D'	Commercial	987 m <sup>2</sup>

<sup>1</sup> Now constructed.

The site plan has since been revised and the following land uses are proposed for Building 'B'. No land use changes are currently proposed to any of the other buildings on the site.

Table 2 Revised Building 'B' Land Uses

Building	Land Use	Size
Building 'B'	Senior Apartments	141 units
	Retail	878 m <sup>2</sup>

The revised site plan for the proposed development has been provided in **Appendix A**.

### **Trip Generation**

The peak hour person-trip generation of Building 'B' was calculated using appropriate vehicle trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (11<sup>th</sup> Edition) and converted to person-trips using a 1.28 conversion factor, in accordance with the City of Ottawa TIA Guidelines.

Table 3 summarizes the person-trip generation associated with Building 'B'.

Table 3 Person-Trip Generation

Land Lleo	Sizo	Peak	Person Trips per Hour				
	0126	Period	In	Out	Total		
252: Senior Adult Housing -	141 unite	AM	12	24	36		
Multifamily	141 011115	PM	26	20	46		
822: Strip Potail Plaza	979 m <sup>2</sup>	AM	22	14	36		
	070111-	PM	47	48	95		
Grant Total		AM	34	38	72		
		РМ	73	68	141		

With the inclusion of a residential land use in the development, it is expected that there may be some internal trips that will occur between the senior apartment building and both the existing and future commercial buildings. These internal trips must be subtracted from the total trip generation of the site in order to obtain the external trip generation. The NCHRP Report 684 Internal Trip Capture tool was used to estimate the internal trip generation of the site, and the results are provided in **Appendix B**<sup>1</sup>. The results of the internalization analysis indicate that during the afternoon peak hour the following number of internal person-trips are projected:

- 12 inbound trips and eight outbound trips associated with the residential component of Building 'B' will remain internal to the site.
- Two inbound trips and three outbound trips associated with the commercial component of Building 'B' will remain internal to the site.
- Six inbound trips and nine outbound trips associated with Buildings 'A', 'C' and 'D' will remain internal to the site.

No internal person-trips are projected during the weekday morning peak hour.

<sup>&</sup>lt;sup>1</sup> The internalization analysis considered the trip generation of Building 'B' as well as the trip generation of the other three existing/proposed buildings on the site.

Consistent with the 2019 TIA, the mode share targets for the site are assumed to remain the same as the existing mode share distribution of the surrounding community. Note that the mode share targets used in this report differ from the 2019 TIA as mode share data specific to land use is now available through the 2020 TRANS Trip Generation Manual. **Table 4** summarizes the existing and target mode share distribution for residential and commercial land uses in the South Gloucester/Leitrim Traffic Assessment Zone (TAZ).

#### Table 4 Existing and Target Mode Shares

Travel Mode	Existing and Target Residential Mode Share <sup>1</sup>	Existing and Target Commercial Mode Share <sup>1</sup>
Auto Driver	52%	72%
Auto Passenger	16%	17%
Transit	22%	3%
Bicycle	1%	0%
Walk	9%	8%

<sup>1</sup> Average of existing weekday morning and afternoon peak period mode shares.

In addition to reductions due to internal trips between the residential and commercial land uses, it is also expected that some of the vehicle-trips generated by the commercial component of Building 'B' will be pass-by trips diverted from existing traffic on Bank Street. The ITE Trip Generation Manual indicates that approximately 40% of vehicle trips to/from the commercial component of the building will be pass-by trips.

The internal person-trips estimated using the NCHRP Report 684 Internal Trip Capture tool have been subtracted from the person-trip estimates in **Table 3** to obtain the estimated number of external person-trips. These external person-trips were subsequently subdivided by mode based on the mode share targets in **Table 4** and vehicle-trips to/from the commercial component of Building 'B' were then further subdivided into pass-by and new trips. The resulting number of person-trips by mode generated by Building 'B' is summarized in **Table 5**.

Traval Modo		AM Peak Hour		PM Peak Hour			
Traver Mode	In	In Out Total		In	Out	Total	
Auto Driver	22	23	45	40	38	78	
➤ New Trips	22	23	45	27	25	52	
➤ Pass-By Trips	-	-	-	13	13	26	
Auto Passenger	6	6	12	10	10	20	
Transit	3	6	9	4	4	8	
Bicycle	-	-	-	-	-	-	
Walk	3	3	6	5	5	10	
Internal	-	-	-	14	11	25	
Grand Total	34	38	72	73	68	141	

Table 5 Person Trips by Mode

**Table 6** compares the vehicle-trip generation of Building 'B' from the 2019 TIA with the vehicle-trip generation associated with the revised land uses.

Table 6 Vehicle-Trip Generation Comparison

Sourco		AM Peak Hour	•	PM Peak Hour			
Jource	In	Out	Total	In	Out	Total	
2019 TIA	25	17	42	27	26	53	
Table 5 (New Trips)	22	23	45	27	25	52	
Change	-3	6	3	0	-1	-1	

Overall, the proposed change in land use is expected to result in a net increase in new vehicle-trips of three vehicles per hour in the weekday morning peak hour and a net decrease of one vehicle per hour in the weekday afternoon peak hour. It can therefore be concluded that the proposed change in land use will have a negligible net impact on the surrounding road network.

## **Swept Path Analysis**

Swept path analysis was undertaken to confirm the functionality of the site using a fire truck, a front-loading waste collection vehicle, a heavy single-unit (HSU) truck, and a moving truck. The results of the swept path analysis are provided in **Appendix C** and indicate that there will be no issues with vehicle circulation.

## **Parking Review**

**Table 7** summarizes the parking requirements associated with the site. The parking requirements for the commercial components of the site are based on the "Shopping Centre" requirements.

Building	Land Use	Parking Space Type	Minimum Parking Requirement	Proposed Parking Supply	
Building 'A'	Hardware Store	Visitor	70	148	
Building A	Warehouse	Visitor	40	140	
	Sonior Apartmonts	Resident	141	141	
Building 'B'	Senior Apartments	Visitor	29	53	
	Retail	Visitor	32		
Building 'C'	Restaurant (incl. Drive-Thru Facility)	Visitor	18	33	
Building 'D'	Commercial	Visitor	36	12	
Total fo	Total for Building 'A' and 'B'		141	141	
Total Io			171	201	
Total for Buildir	Total for Building 'A', 'B', 'C' and 'D'		141	141	
			225	246	

Table 7 Parking Summary

In the interim when only Building 'A' and 'B' are constructed, there will be sufficient parking to meet the minimum resident and visitor parking requirements. Designated spaces will not be provided for residential visitor parking and instead residential and commercial visitor parking will be shared.

Once the site is fully built out, the proposed number of resident and visitor parking spaces will meet and exceed the minimum parking requirements.

A total of ten accessible parking spaces (five Type 'A' spaces and five Type 'B' spaces) will be provided with Building 'A' and 'B', with an additional three spaces (two Type 'A' spaces and one Type 'B') provided when Building 'C' and 'D' are constructed. In the interim when only Building 'A' and 'B' are constructed, five Type 'A' spaces and four Type 'B' spaces will be required. Once Building 'C' and 'D' are constructed, an additional Type 'B' space will be required. As such, the minimum accessible parking requirements have been met. The parking space widths, lengths and access aisle widths meet the City of Ottawa Accessibility Design Standards requirements as well.

In terms of bicycle parking, Building 'B' will include 40 exterior bicycle parking spaces and 35 underground spaces. A total of 71 and four (4) spaces are required for the residential and commercial components of the building, therefore, the minimum bicycle parking requirement is met.

As the commercial component of Building 'B' is less than 2,000 m<sup>2</sup>, no loading space is required as per the Zoning By-law. Despite the fact that a loading space is not required, a pick-up/drop-off and loading zone has been provided at the main entrance to the building. This area is approximately 40m long which is sufficient for several passenger vehicles and/or large delivery/moving trucks to use simultaneously. This area could also accommodate emergency response services and provide them with a location to park near the main entrance to the building.

The total commercial space for the full site (Building 'A', 'B', 'C' and 'D') will equal 4,928 m<sup>2</sup>. For a commercial site of that size, a minimum of one loading space is required. Two loading spaces are proposed, thereby exceeding this requirement.

The Zoning By-law specifies the following size requirements for parking facilities:

- Drive aisles must be a minimum of 6.0m in width inside the parking garage and 6.7m in width in the groundlevel parking lot.
- Regular parking spaces must be a minimum of 5.2m long and 2.6m wide

The proposed parking facility has been reviewed and meets the above requirements.

### **Transportation Demand Management (TDM)**

A number of pedestrian pathways will be provided within the proposed development and connect at several locations to the existing sidewalks on Dun Skipper Drive and the future sidewalks on Bank Street. The proposed development will therefore have excellent connectivity to the existing and future pedestrian network.

The presence of on-site retail land uses will also permit future residents to meet some of their daily needs by nonauto modes of transportation. There are also bus stops on Dun Skipper Drive near Cedar Creek Drive, less than a 200m walking distance from the building, thereby providing residents access to transit as well. To further encourage the use of sustainable travel modes, multi-modal information packages will be provided to first time residents upon move-in. This is expected to help establish sustainable travel patterns from the start.

The proposed development has been designed to be supportive of TDM by locating the building close to the street with parking at the rear and side, minimizing walking distances to sidewalks and transit stops, ensuring visibility of pedestrians from the building, targeting low operating speeds on-site, providing wayfinding signage as

required, providing a pick-up/drop-off area near the main entrance, and separating long-term and short-term parking where possible.

Additionally, the following post-occupancy TDM program will be implemented: periodic travel surveys, local area maps of transit stops and cycling and pedestrian facilities, separating the cost of parking from monthly rent, and providing all new residents multimodal information packages. A number of additional measures may also be considered if there is enough interest from residents.

The City of Ottawa's TDM-Supportive Development Design and Infrastructure Checklist and TDM Measures Checklist were completed for the proposed development and are provided in **Appendix D**.

### Conclusion

Trip generation estimates indicate that the proposed change in land use for Building 'B' will result in a nominal net increase of three two-way vehicle trips in the weekday morning peak hour, and a net decrease of one vehicle trip in the weekday afternoon peak hour. As such, it has been concluded that the proposed change will have a negligible impact on the intersection capacity analysis presented in the 2019 TIA.

Swept path analysis has been completed which has confirmed that fire trucks, waste collection vehicles, delivery trucks and moving trucks will be able to circulate within the site without any issues. A review of the proposed parking facilities also confirms that it meets the Zoning By-law requirements.

The presence of on-site retail land uses and nearby transit bus stops will ensure that residents can meet some of their daily needs via non-auto modes of transportation. The site has been designed to support TDM by providing convenient access to adjacent pedestrian and transit facilities, targeting low on-site operating speeds, providing a pick-up/drop-off area at the main entrance to the building as well as a number of other design elements. To further encourage the use of sustainable travel modes, a suite of post-occupancy TDM measures will be implemented including periodic travel surveys, displaying transit, pedestrian and cycling maps, separating the cost of parking from rent and providing multi-modal information packages to residents upon move-in. Additional TDM measures may be considered if sufficient interest is expressed by future residents.

In conclusion, it is the overall opinion of Arcadis that the proposed development can be safely accommodated by the adjacent road network.



# **Appendix A: Site Plan**



				DO NOT SCALE DRAWINGS	
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				UNLESS STAMPED AND SIGNED BY THE	IN
				COMFORMANCE WITH THE ONTARIO BUILDING	
				CODE.	
				Revisions	
				Revision Revision Number Date Revision Description	'n
	) SETBACK				<u> </u>
7655 3	000			1     2024-02-20     MINOR VARIANCE       2     2024-12-09     MINOR VARIANCE r1	
	×.				
		X	BICYCLE SCHEDULE		
	Q		Type Co GARAGE P2	punt	
PLAZA			Bicycle Space, 16		
DN DN		393	GARAGE P1		
			Bicycle Space, 20 Horizontal		
ENTRANCE			GROUND FLOOR		
			Horizontal		
			76	UNIT MIX	
	FRONT YARD S	SETBACK	UNITS PER FLOOR	Name     Area     Count       1 BEDROOM A3     670 ft²     16	-
3276			Level Co	unt 1 BEDROOM A1 690 ft <sup>2</sup> 16	
3000			THIRD FLOOR 18	1 BEDROOM AS     710 ft²     8       1 BEDROOM A2     750 ft²     16	
UN U			FOURTH FLOOR 18	1 BEDROOM A4     750 ft²     16       1 BEDROOM A6     750 ft²     2	
A			SIXTH FLOOR 18	1 BEDROOM A6 760 ft <sup>2</sup> 2	
			SEVENTH FLOOR 18	1 BEDROOM A4     790 ft²     8       1 BEDROOM A4     840 ft²     3	_
			NINTH FLOOR 15	2 BEDROOM B3 990 ft <sup>2</sup> 4	
			141	2 BEDROOM B2 1050 ft <sup>2</sup> 8 2 BEDROOM B1 1080 ft <sup>2</sup> 7	_
		PARK	ING SCHEDULE	2 BEDROOM B4 1080 ft <sup>2</sup> 3 2 BEDROOM B1 1090 ft <sup>2</sup> 7	
		BUILDING B	Mark Count	2 BEDROOM + DEN C2 1100 ft <sup>2</sup> 4	
		GARAGE P2	5200 R 43	2 BEDROOM B1 1100 ft <sup>2</sup> 7 2 BEDROOM B1 1110 ft <sup>2</sup> 7	_
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Ê I		Small Space 2400 Small Space 2600	0x5200 Rs 1 0x4600 Rs 6	87 [62%] 1 BEDROOM	
		GARAGE P1	5200 P 42	54 [38%] 2 BEDROOM	
		Small Space 2400	0x4600 Rs 2	AMENITY AREA	
3300		Small Space 2400 Small Space 2600	0x5200 Rs 1 0x4600 Rs 6	REQ'D PROPOSED	
		GROUND FLOOP	<u>}</u>	TOTAL 6sqm/UNIT 1510 (870sqm)	
	99	BF Space Zooux	3400x5200     C     24	COMMUNAL >50% TOTAL 560	
	1218	BF Space Type B Std Space 2600x	2400x5200 C/V 3	BALCONIES N/A 950	
gen versk fan geskelder af de fan de fan De fan de fan		Std Space 2600x	5200 R 38	Interior of Building contains enough Amenity Area that no exterior Amenity Area is needed	
		EXISTING A&D	194		
		GROUND FLOOF	3400x5200 C 3	BICYCLES REQ'D PROPOSED	,
		BF Space Type B	2400x5200 C 3	RESIDENTIAL 0.5 PER UNIT 71 71	
CE		Std Space 2600x	5200 C 154 160	RETAIL 1/250sqm GFA 4 4	
		FUTURE C	2	TOTAL 75 (40 EXTERIOR, 35 UNDERGROUND	,
		BF Space Type A	3400x5200 C 1	WITHIN THE 92 TENANT STORAGE LOCKERS	)
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			387		
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		STAURANT 502.2 sqm7 100 x	3.0 = 18 33	Project	
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	A + B -	+ C + D	= 366 387	Apartments	
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No Minimum

3m

7.5m

Minimum Lot Width Minimum Front Yard

Minimum Rear Yard

Minimum Corner Side Yard 3m

Minimum Interior Side Yard 3m

Maximum Building Height 18m

35.9m

3.2m

3.2m 3.2m

45.1m

34.2m

				-
Scale	As indicated		Date	2024-12-09 8:20:02 PM
Project No.	2330		Revisio	n 2
Drawing No.	A010			
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# **Appendix B: Internal Trip Generation**

NCHRP 684 Internal Trip Capture Estimation Tool								
Project Name:	155 Dun Skipper Drive	Organization:	Arcadis					
Project Location:			Performed By:	EM				
Scenario Description:			Date:	2024-10-01				
Analysis Year:			Checked By:					
Analysis Period:	AM Street Peak Hour		Date:					

#### Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

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Land Llas	Development Data (For Information Only)			Estimated Vehicle-Trips <sup>3</sup>			
Land Use	ITE LUCs <sup>1</sup>	Quantity	Units	Total	Entering	Exiting	
Office				0			
Retail				288	155	133	
Restaurant				0			
Cinema/Entertainment				0			
Residential				36	12	24	
Hotel				0			
All Other Land Uses <sup>2</sup>				0			
				324	167	157	

Table 2-A: Mode Split and Vehicle Occupancy Estimates							
L and L la a		Entering Tri	ps		Exiting Trips		
Land Ose	Veh. Occ.4	% Transit	% Non-Motorized		Veh. Occ.4	% Transit	% Non-Motorized
Office							
Retail	1.00				1.00		
Restaurant							
Cinema/Entertainment							
Residential	1.00				1.00		
Hotel							
All Other Land Uses <sup>2</sup>							

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)										
Origina (France)		Destination (To)								
Oligin (Floin)	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel				
Office										
Retail										
Restaurant										
Cinema/Entertainment										
Residential										
Hotel										

Table 4-A: Internal Person-Trip Origin-Destination Matrix*											
Origin (From)	Destination (To)										
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office		0	0	0	0	0					
Retail	0		0	0	0	0					
Restaurant	0	0		0	0	0					
Cinema/Entertainment	0 0 0 0										
Residential	0	0 0 0 0 0 0									
Hotel	0	0	0	0	0						

Table 5-A: Computations Summary				Table 6-A: Internal Trip Capture Percentages by Land Use			
Total Entering Exiting		Land Use	Entering Trips	Exiting Trips			
All Person-Trips	324	167	157	Office	N/A	N/A	
Internal Capture Percentage	0%	0%	0%	Retail	0%	0%	
				Restaurant	N/A	N/A	
External Vehicle-Trips <sup>5</sup>	324	167	157	Cinema/Entertainment	N/A	N/A	
External Transit-Trips <sup>6</sup>	0	0	0	Residential	0%	0%	
External Non-Motorized Trips <sup>6</sup>	0	0	0	Hotel	N/A	N/A	

<sup>1</sup> Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.							
Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.							
<sup>3</sup> Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i> ).							
<sup>4</sup> Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.							
<sup>5</sup> Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.							
<sup>6</sup> Person-Trips							
Indicates computation that has been rounded to the nearest whole number.							
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1							

Project Name:	155 Dun Skipper Drive
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends											
Landling	Tab	le 7-A (D): Enter	ing Trips		Table 7-A (O): Exiting Trips						
Land Use	Veh. Occ.	Vehicle-Trips	Person-Trips*		Veh. Occ.	Vehicle-Trips	Person-Trips*				
Office	1.00	0	0		1.00	0	0				
Retail	1.00	155	155			1.00	133	133			
Restaurant	1.00	0	0		1.00	0	0				
Cinema/Entertainment	1.00	0	0		1.00	0	0				
Residential	1.00	12	12		1.00	24	24				
Hotel	1.00	0	0		1.00	0	0				

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)											
Origin (From)	Destination (To)										
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office		0	0	0	0	0					
Retail	39		17	0	19	0					
Restaurant	0	0		0	0	0					
Cinema/Entertainment	0	0	0		0	0					
Residential	0	0	5	0		0					
Hotel	0	0	0	0	0						

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)											
Origin (From)	Destination (To)										
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office		50	0	0	0	0					
Retail	0		0	0	0	0					
Restaurant	0	12		0	1	0					
Cinema/Entertainment	0	0	0		0	0					
Residential	0	26	0	0		0					
Hotel	0	6	0	0	0						

Table 9-A (D): Internal and External Trips Summary (Entering Trips)										
		Person-Trip Esti	mates		External Trips by Mode*					
Destination Land Use	Internal	External	Total		Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>			
Office	0	0	0		0	0	0			
Retail	0	155	155		155	0	0			
Restaurant	0	0	0		0	0	0			
Cinema/Entertainment	0	0	0		0	0	0			
Residential	0	12	12		12	0	0			
Hotel	0	0	0		0	0	0			
All Other Land Uses <sup>3</sup>	0	0	0		0	0	0			

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)											
	I	Person-Trip Esti	mates			External Trips by Mode*					
Origin Land Use	Internal	External	Total		Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>				
Office	0	0	0		0	0	0				
Retail	0	133	133		133	0	0				
Restaurant	0	0	0		0	0	0				
Cinema/Entertainment	0	0	0		0	0	0				
Residential	0	24	24		24	0	0				
Hotel	0	0	0		0	0	0				
All Other Land Uses <sup>3</sup>	0	0	0		0	0	0				

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

<sup>2</sup>Person-Trips

<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator \*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool										
Project Name:	Arcadis									
Project Location:			Performed By:	EM						
Scenario Description:			Date:	2024-10-01						
Analysis Year:		Checked By:								
Analysis Period:	PM Street Peak Hour	Date:								

	Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)									
Land Llas	Developme	ent Data ( <i>For Inf</i>	formation Only)		Estimated Vehicle-Trips <sup>3</sup>					
Lanu Ose	ITE LUCs <sup>1</sup>	Quantity	Units		Total	Entering	Exiting			
Office					0					
Retail					398	188	210			
Restaurant					0					
Cinema/Entertainment					0					
Residential					46	26	20			
Hotel					0					
All Other Land Uses <sup>2</sup>					0					
					444	214	230			

Table 2-P: Mode Split and Vehicle Occupancy Estimates									
L an d Llas		Entering Tri	ps			Exiting Trips			
Land Use	Veh. Occ.4	% Transit	% Non-Motorized		Veh. Occ. <sup>4</sup>	% Transit	% Non-Motorized		
Office									
Retail	1.00				1.00				
Restaurant									
Cinema/Entertainment									
Residential	1.00				1.00				
Hotel									
All Other Land Uses <sup>2</sup>									

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)											
		Destination (To)									
Oligin (Floin)	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office											
Retail					338						
Restaurant											
Cinema/Entertainment											
Residential		338									
Hotel											

Table 4-P: Internal Person-Trip Origin-Destination Matrix*											
Origin (From)		Destination (To)									
Oligili (Floili)	Office Retail Restaurant Cinema/Entertainment		Residential	Hotel							
Office		0	0	0	0	0					
Retail	0		0	0	12	0					
Restaurant	0	0		0	0	0					
Cinema/Entertainment	0	0	0		0	0					
Residential	0	8	0	0		0					
Hotel	0	0	0	0	0						

Table 5-P: Computations Summary				Table 6-P: Internal	Table 6-P: Internal Trip Capture Percentages by Land Use			
	Total	Entering	Exiting	Land Use	Entering Trips	Exiting Trips		
All Person-Trips	444	214	230	Office	N/A	N/A		
Internal Capture Percentage	9%	9%	9%	Retail	4%	6%		
				Restaurant	N/A	N/A		
External Vehicle-Trips <sup>5</sup>	404	194	210	Cinema/Entertainment	N/A	N/A		
External Transit-Trips <sup>6</sup>	0	0	0	Residential	46%	40%		
External Non-Motorized Trips <sup>6</sup>	0	0	0	Hotel	N/A	N/A		

<sup>1</sup>Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

<sup>2</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

<sup>3</sup>Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

<sup>4</sup>Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be <sup>5</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

<sup>6</sup>Person-Trips

\*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	155 Dun Skipper Drive
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends											
	Table 7-P (D): Entering Trips				Table 7-P (O): Exiting Trips						
Land Use	Veh. Occ.	Vehicle-Trips	Person-Trips*	T	Veh. Occ.	Vehicle-Trips	Person-Trips*				
Office	1.00	0	0		1.00	0	0				
Retail	1.00	188	188		1.00	210	210				
Restaurant	1.00	0	0		1.00	0	0				
Cinema/Entertainment	1.00	0	0		1.00	0	0				
Residential	1.00	26	26		1.00	20	20				
Hotel	1.00	0	0		1.00	0	0				

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)											
Origin (From)	Destination (To)										
Oligin (From)	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office		0	0	0	0	0					
Retail	4		61	8	55	11					
Restaurant	0	0		0	0	0					
Cinema/Entertainment	0	0	0		0	0					
Residential	1	8	4	0		1					
Hotel	0	0	0	0	0						

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)											
Origin (From)		Destination (To)									
Oligin (From)	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel					
Office		15	0	0	1	0					
Retail	0		0	0	12	0					
Restaurant	0	94		0	4	0					
Cinema/Entertainment	0	8	0		1	0					
Residential	0	18	0	0		0					
Hotel	0	4	0	0	0						

Table 9-P (D): Internal and External Trips Summary (Entering Trips)										
	P	erson-Trip Estima	ates		External Trips by Mode*					
Destination Land Use	Internal	External	Total	1	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>			
Office	0	0	0		0	0	0			
Retail	8	180	188		180	0	0			
Restaurant	0	0	0		0	0	0			
Cinema/Entertainment	0	0	0		0	0	0			
Residential	12	14	26		14	0	0			
Hotel	0	0	0		0	0	0			
All Other Land Uses <sup>3</sup>	0	0	0		0	0	0			

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)									
	P	erson-Trip Estima	ites		External Trips by Mode*				
Origin Land Use	Internal	External	Total	1	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>		
Office	0	0	0		0	0	0		
Retail	12	198	210		198	0	0		
Restaurant	0	0	0		0	0	0		
Cinema/Entertainment	0	0	0		0	0	0		
Residential	8	12	20		12	0	0		
Hotel	0	0	0		0	0	0		
All Other Land Uses <sup>3</sup>	0	0	0		0	0	0		

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

<sup>2</sup>Person-Trips <sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator \*Indicates computation that has been rounded to the nearest whole number.

# **Appendix C: Swept Path Analysis**









## **Appendix D: Transportation Demand Management**

#### **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-s	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	$\checkmark$
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	$\checkmark$
	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)	□ N/A - No rapid transit near site
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 <i>(see Official</i> <i>Plan policy 4.3.12)</i>	$\checkmark$

	TDM-s	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)	$\checkmark$		
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)	$\checkmark$		
BASIC	1.2.6	Provide safe, direct and attractive walking routes from building entrances to nearby transit stops	Provided walking routes from building to stoplights which provide access to transit stop across the street. Refer to A010		
BASIC	1.2.7	Ensure that walking routes to transit stops are secure, visible, lighted, shaded and wind-protected wherever possible	Will provide. Refer to A010		
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	Internal Roads through parking lot will be designed for low operating speeds		
	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	Refer to landscape drawings		
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)	Will provide		

	TDM-s	supportive design & infrastructure measures: Residential developments	Check if completed & add descriptions, explanations or plan/drawing references
	2.	WALKING & CYCLING: END-OF-TRIP FACILI	TIES
	2.1	Bicycle parking	
REQUIRED	2.1.1	Provide bicycle parking in highly visible and lighted areas, sheltered from the weather wherever possible <i>(see Official Plan policy 4.3.6)</i>	$\checkmark$
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 ( <i>see Zoning By-law Section 111</i> )	
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 <i>(see Zoning By-law Section 111)</i>	
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	Expected number of resident owned and visitor bicycles is as per zoning
	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)	$\checkmark$
BETTER	2.2.2	Provide secure bicycle parking spaces equivalent to at least the number of units at condominiums or multi- family residential developments	Not Providing, but tenant storage lockers will be sized to fit excess bicycles
	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)	Not Providing, but may provide in the future if enough interest from residents
	3.	TRANSIT	
	3.1	Customer amenities	
BASIC	3.1.1	Provide shelters, lighting and benches at any on-site transit stops	N/A, no 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	N/A, no site transit stops abutting site
BETTER	3.1.3	Provide a secure and comfortable interior waiting area by integrating any on-site transit stops into the building	N/A, no on site transit stops

	TDM-s	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	Drop off and Pick up area provided, refer to A010
	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 <i>(see Zoning By-law Section 94)</i>	Not Providing, but may provide in the future if enough interest from residents
	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	Not Providing
	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	Not Providing
BASIC	6.1.3	Where a site features more than one use, provide shared parking and reduce the cumulative number of parking spaces accordingly <i>(see Zoning By-law</i> <i>Section 104)</i>	Will share retail and visitor spaces, refer to A010
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 <i>(see Zoning By-law Section 111)</i>	Not necessary for residents, not providing for retail
	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)	Will separate where possible. Majority of long term parking will be in parking garage. Visitor spaces will be indicated with signs

#### **TDM Measures Checklist:**

Residential Developments (multi-family, condominium or subdivision)

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

The measure is one of the most dependably effective tools to encourage the use of sustainable modes

	TDM	measures: Residential developments	Check if proposed & add descriptions		
	1.	TDM PROGRAM MANAGEMENT			
	1.1	Program coordinator			
BASIC	★ 1.1.1	Designate an internal coordinator, or contract with an external coordinator	No official designation, but property owner will perform similar work		
	1.2	Travel surveys			
BETTER	1.2.1	Conduct periodic surveys to identify travel-related behaviours, attitudes, challenges and solutions, and to track progress	By property owner		
	2.	WALKING AND CYCLING			
	2.1	Information on walking/cycling routes & destinations			
BASIC	2.1.1	Display local area maps with walking/cycling access routes and key destinations at major entrances (multi-family, condominium)	Will provide in apartment lobby area		
	2.2	Bicycle skills training			
BETTER	2.2.1	Offer on-site cycling courses for residents, or subsidize off-site courses	If enough interest by residents		

TDM measures: Residential developments			measures: Residential developments	Check if proposed & add descriptions		
		3.	TRANSIT			
		3.1	Transit information	_		
BASIC		3.1.1	Display relevant transit schedules and route maps at entrances (multi-family, condominium)	þ	Will provide in apartment lobby area	
BETTER		3.1.2	Provide real-time arrival information display at entrances (multi-family, condominium)		Will not provide at this time	
		3.2	Transit fare incentives			
BASIC	*	3.2.1	Offer PRESTO cards preloaded with one monthly transit pass on residence purchase/move-in, to encourage residents to use transit		Will not provide at this time	
BETTER		3.2.2	Offer at least one year of free monthly transit passes on residence purchase/move-in		Will not provide	
		3.3	Enhanced public transit service			
BETTER	*	3.3.1	Contract with OC Transpo to provide early transit services until regular services are warranted by occupancy levels <i>(subdivision)</i>		Will not provide at this time	
		3.4	Private transit service	-		
BETTER		3.4.1	Provide shuttle service for seniors homes or lifestyle communities (e.g. scheduled mall or supermarket runs)	Ċ	Will provide if enough interest from residents for this service	
		4.	<b>CARSHARING &amp; BIKESHARING</b>			
		4.1	Bikeshare stations & memberships			
BETTER		4.1.1	Contract with provider to install on-site bikeshare station ( <i>multi-family</i> )		Will not provide at this time	
BETTER		4.1.2	Provide residents with bikeshare memberships, either free or subsidized <i>(multi-family)</i>		Will not provide	
		4.2	Carshare vehicles & memberships			
BETTER		4.2.1	Contract with provider to install on-site carshare vehicles and promote their use by residents		If enough interest, may provide in the future	
BETTER		4.2.2	Provide residents with carshare memberships, either free or subsidized		Will not provide	
		5.	PARKING			
		5.1	Priced parking			
BASIC	*	5.1.1	Unbundle parking cost from purchase price (condominium)		N/A, not a condo	
BASIC	*	5.1.2	Unbundle parking cost from monthly rent (multi-family)	Ф	Parking spaces will be leased separately	

TDM measures: <i>Residential developments</i>				Check if proposed & add descriptions
6. TDM MARKETING & COMMUNICATIONS				
	6.1	Multimodal travel information		
BASIC	★ 6.1.1	Provide a multimodal travel option information package to new residents	$\mathbf{\nabla}$	
	6.2	Personalized trip planning		
BETTER	★ 6.2.1	Offer personalized trip planning to new residents		Will not provide at this time