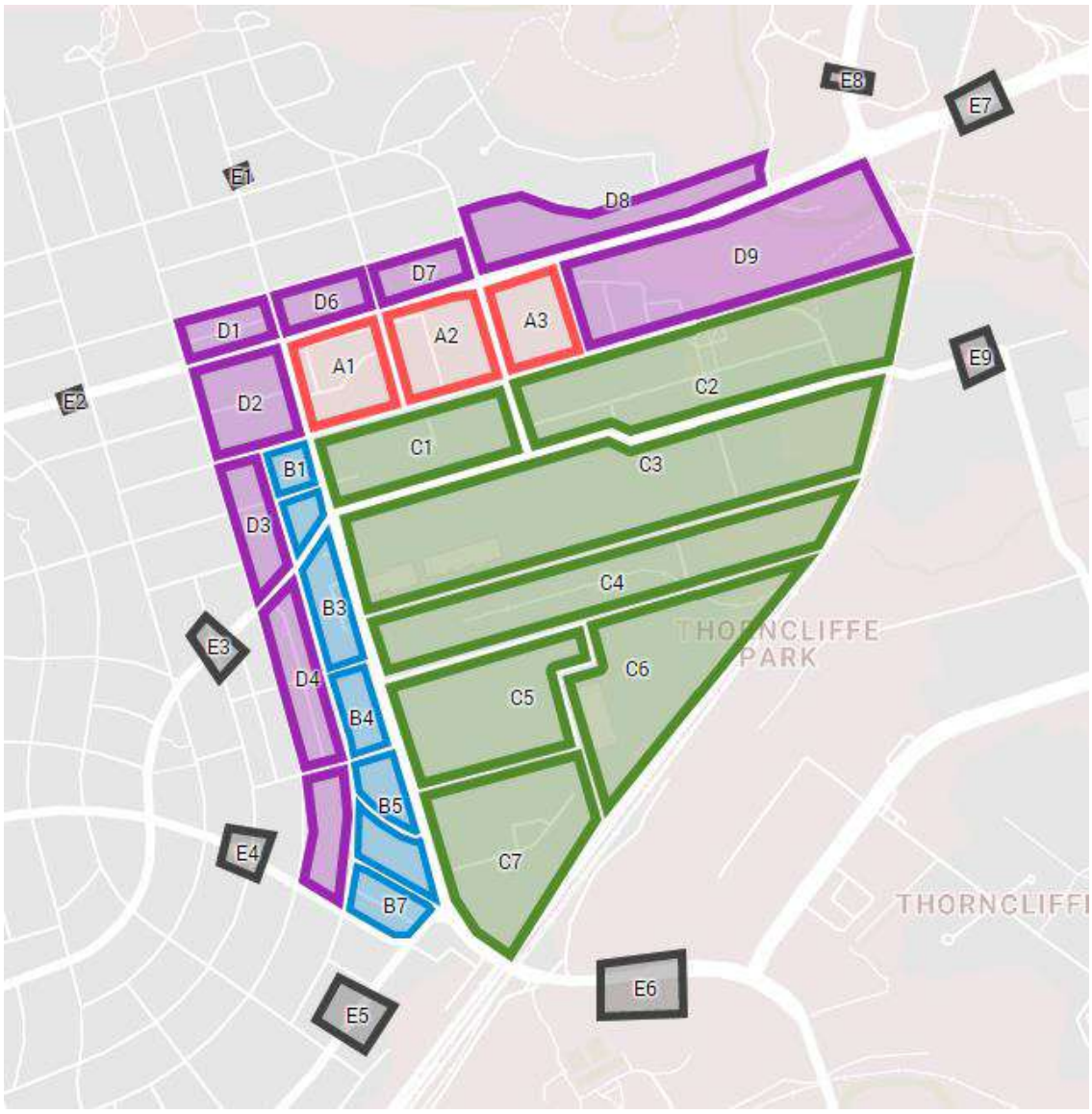
Figure 7-4: Demand Analysis Zones



7.4.1 Trip Generation and Modal Split

To assess total travel demands, total trips would need to be generated, and then assigned to different mode shares. Assumptions for each of the following development type, residential, commercial, office, and community/institutional is provided below.

Modal splits for existing land uses were based on TTS estimates of the area including zones 217, 219, and 220 as shown in Figure 7-5. The existing mode splits for the AM and PM peak hours is shown in Figure 7-6. To remain conservative, it was assumed that the existing blocks within Area's C and D would continue to follow the existing mode splits.

Figure 7-5: TTS Zones Assessed

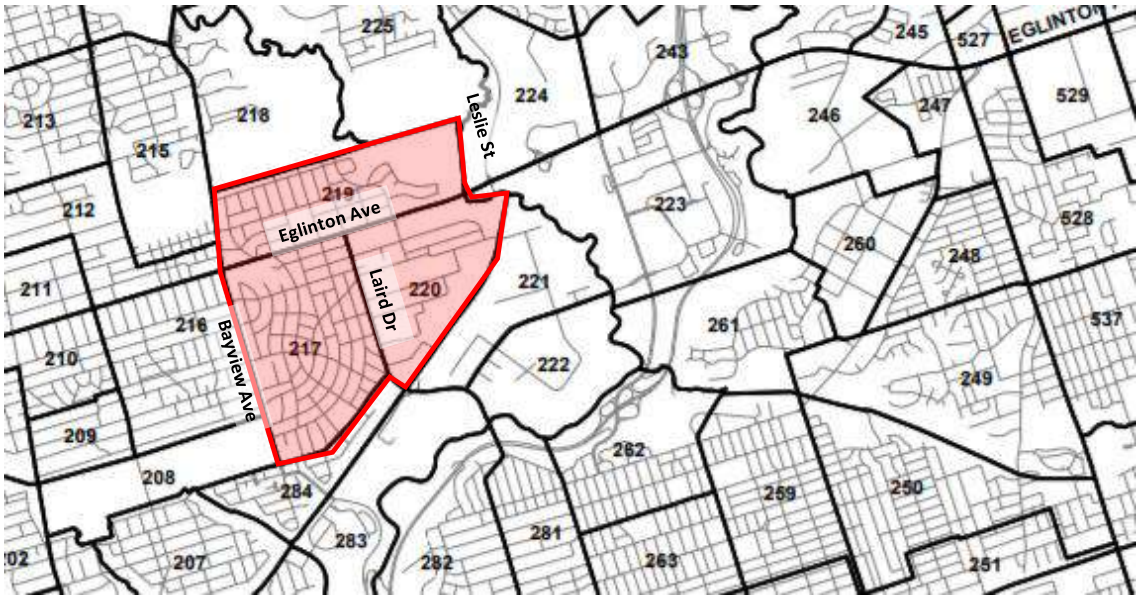
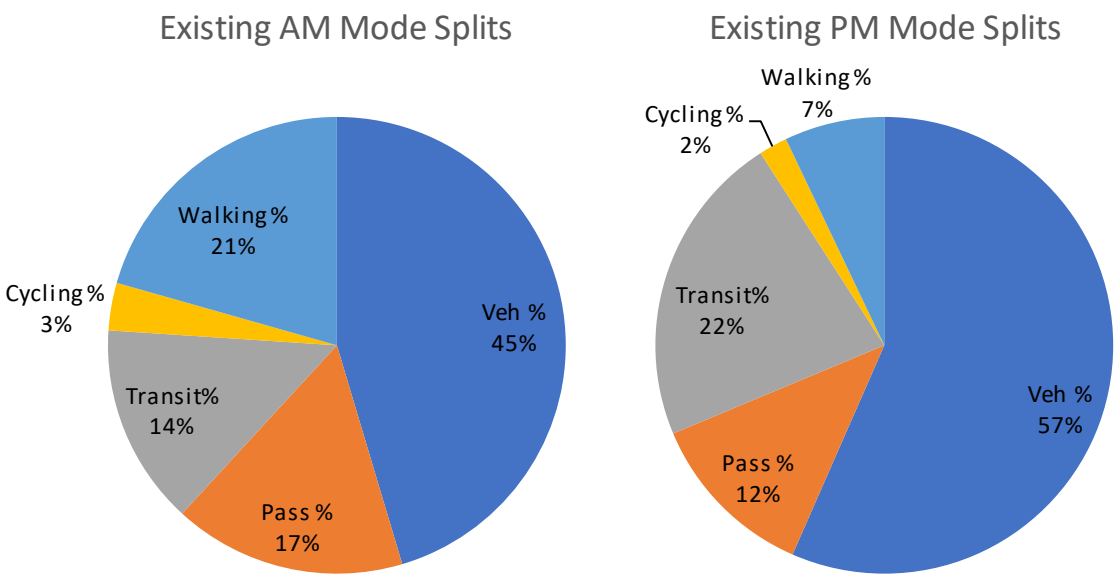


Figure 7-6: Existing Mode Splits (Based on TTS Data)



Residential

Residential trip generation was calculated based on the total number of residents in the 3 TTS zones, and the total number of trips to and from the zones. Results and the rate used to develop total trips per resident in the peak hour is shown below. This was used for both existing and future residential developments. The number of residents per existing zone was determined by disaggregating the TTS zone by land area.

Table 7-1: Residential Trip Generation Rates

Period	Inbound Per Resident	Outbound Per Resident
AM Rate	0.02	0.31
PM Rate	0.19	0.04

Office/Employee

New office developments within the mixed scope context compared with existing employment uses are significantly different. As a result, existing employment uses were calculated based on the number of employment based trips TTS Zone 220 produced, and the number of employees within the zone. Employment within each development block in Area C was simply the existing employment numbers for the area based on TTS split evenly among each zone.

Future employment was quite low, only approximately 500 employees in the Area A development blocks, as a result, the ITE Trip Generation Manual rates were used as a reasonable approximation as shown below.

Table 7-2: Employment Trip Generation Rates

Period	Inbound Per Employee	Outbound Per Employee
AM Rate	0.40	0.06
PM Rate	0.07	0.34

Commercial

The majority of existing commercial development is within Area C. As a result, Zones C3 and C5, which contain two of the largest commercial blocks were assumed to generate the majority of commercial traffic within Area C. All shopping purposed trips from TTS in this zone were assigned to these two blocks to remain conservative. Future retail/commercial trips were calculated based on ITE Trip Generation Manual Rates as a reasonable approximation as shown below.

Table 7-3: Commercial Trip Generation Rates

Period	Inbound Per 100 Sq M	Outbound Per Sq M
AM Rate	0.021	0.015
PM Rate	0.037	0.037

Community/Institutional

Community and institutional land uses can be extremely varied depending on the actual land use type. The community facility trip rate was based trip rates proposed for a community facility nearby (Leaside Arena), where proxy sites were used to estimate trip rates as shown below. The institutional land use within Area B was approximated using commercial rates given the lack of data available.

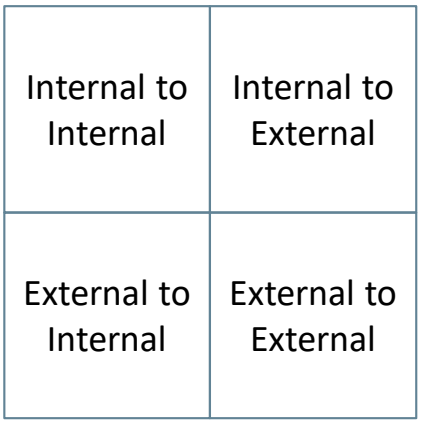
Table 7-4: Community Trip Generation Rates

Period	Inbound Per 100 Sq M	Outbound Per 100 Sq M
AM Rate	0.0	0.0
PM Rate	1.07	0.49

7.4.2 Trip Distribution

In a typical demand model, there are four trip origins and destination sets that need to be assessed as shown in Figure 7-7.

Figure 7-7: Typical Trip Distribution Matrix



To determine the trips to and from the study area blocks (A, B, C, and D) that remain within these blocks, versus destined to or from external zones, the "*National Cooperative Highway Research Program (NCHRP) Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*" methodology was used. Generated trips were inputted into this tool, which resulted in a matrix of travel demands between internal trip uses, and the external travel demands per mode.

Internal – Internal Trips

Internal trips from the internal trip capture methodology were distributed based on the proportion of trips each development block produces for each trip purpose. TTS data for the area shows that short distance trips had a mode split of 60% auto, 39% walking and 1% cycling with transit trips removed. It was assumed that in the context of the study area boundaries, there would be limited availability and opportunity for transit trips in between the development blocks.

Internal – External / External - Internal Trips

The total number of trips from and to each development block is outputted from the internal trip capture methodology. These were then distributed to each development block by the proportion of trips per mode each block generated. The external zone distribution was derived using Streetlight GPS data, this is shown in the table below.

Table 7-5: External Trip Distribution

External Zone	AM		PM	
	From (Ext to Int)	To (Int to Ext)	From (Ext to Int)	To (Int to Ext)
E1	0%	0%	0%	1%
E2	19%	4%	19%	21%
E3	8%	8%	7%	9%
E4	3%	1%	1%	1%
E5	15%	6%	17%	17%
E6	14%	14%	16%	7%
E7	5%	39%	22%	17%
E8	32%	26%	17%	24%
E9	3%	2%	1%	3%

Transit trips are not subject to this distribution as they start from each development block, assumed to travel using an active mode share to the transit stop/station before continuing on the transit route. Existing route passenger volumes were used to determine the percentage of trips to each transit route. Transit trips can then be assigned to the pedestrian and cycling networks and layered with the pedestrian and cycling trips, but also be used to assess capacities required on the feeder bus network and at the ECLRT station.

Table 7-6: Transit Distribution

Transit Line/Stop	From Transit Stop to Study Area	From Study Area to Transit Stop	Basis/Justification
Line/Route 1	72%	72%	(Eglinton LRT based on #34+54)
Line/Route 2	5%	5%	(Other interlined routes along Eglinton Based on #51)
Line/Route 3	19%	19%	(Leaside based on #56)
Line/Route 4	5%	5%	(south Leaside based on #88)

External – External Trips

External trips unrelated to the study area represent the background traffic levels through the area. Future travel patterns will change depending on a variety of development and roadway capacity factors, thus to estimate these background trips, Streetlight data was used to find the proportion of trips from each external node to each other. Streetlight allows calibration of these trips to traffic counts, and projected counts based on the EGLINTONconnects study were used. It should be noted that the adopted methodology for EGLINTONconnects was to simply grow existing counts based on an established growth rate for the area.

The resultant external-external matrix required some manual calibration based on existing counts due to some order of magnitude differences at the calibration locations. This is presumed to be as a result of differences in travel patterns over time, and the fact that counts are subject to daily fluctuations. An assignment was completed with only these external-external trips to ensure that generated network volumes were reasonable. Streetlight data is shown in Appendix F, and the analysis worksheets including matrices for each scenario is provided in Appendix C.

Distributed Trips

The different matrices for internal and external trips were then combined for each travel mode, vehicle, cycling and pedestrian. Transit trips generate a separate pedestrian and cycling distribution matrix based on the stop locations.

7.4.3 Trip Assignment

Trips were assigned based on an All or Nothing algorithm. This means that trips from each zone/block would take the same route to reach a different zone/block based on the shortest travel time and/or distance. As a result of this methodology, it should be noted that proposed vehicle flows are desired vehicle flows that do not take into account available capacity and delays.

7.4.4 Base Case Analysis

To begin the iterative assessment process, the first step was to develop an assessment of the base built form alternatives. Three alternatives were initially reviewed, however due to the limited differences in total population and employment for the three alternatives, Scenario A was considered the base case as all three scenarios would each produce a similar number of

potential trips. It should be noted that changes in land-use and built form would primarily affect Study Area A, whereas Area B has limited development block sizes, thus there are limited options possible. The mode share was derived from existing conditions for zones which are not changing, and new development areas used assumptions from other areas along Eglinton Avenue as per the EGLINTONconnects Study. The following table shows the populations in Area A, with a breakdown by land use type.

Table 7-7: Initial Development Scenarios

Scenario	Total Population	Residential	Office	Commercial	Community Facility
Scenario A	8834	7886	363	573	12
Scenario B	9171	7178	1627	366	0
Scenario C	8868	8352	80	400	36

The base case test shows that vehicles would face some constrained conditions along Eglinton Avenue east of Brentcliffe, and along Laird Drive south of Eglinton. This could result in the following impacts:

- Peak spreading due to limitations in capacity during peak hour;
- Further changes in mode splits due to slow travel times of personal vehicle trips;
- Shortcutting or use of alternative routes;
- Longer queues and delays at intersections; and,
- Increased need for TDM and/or other strategies to limit vehicle trips.

Table 7-8: Base Case Demand

Scenario	Link	Capacity Available Per Direction	Traffic Volumes	
			SB/WB	NB/EB
Initial Base ~40%/60%	Laird South of Vanderhoof	1000-1500	1260 (1090)	1400 (1670)
	Eglinton East of Laird	2000-2500	1530 (2120)	2370 (1970)
	Eglinton East of Brentcliffe	2000-2500	1610 (2210)	2760 (2090)

7.5 Land Use Refinement

An iterative process between the land use and proposed built form, with the resulting roadway capacity and transportation impacts being used to work towards a preferred development scheme.

After the initial base case assessment, a more refined option was considered, with reduced population and employees in Study Area A. The results are shown in the table below.

Table 7-9: Refined Development Scenario Statistics Per Zone

Zone/Block	Residential Population	Employees	Commercial GFA (M^2)	Community/Institutional GFA (M^2)
A1	2,754	180	8,195	2,400
A2	2,601	335	8,440	0
A3	1,923	0	1,420	0
Area A Total	**7,278**	**515**	**18,055**	**2,400**
B1	98	0	1,244	0
B2	174	0	616	0
B3	580	0	1,558	11,451
B4	274	0	3,100	0
B5	125	0	2,444	0
B6	131	0	808	0
B7	148	0	0	0
Area B Total	**1,530**	**-**	**9,770**	**11,451**

Along with the proposed land use, further permutations of mode splits and development sizes for Area A were considered to provide guidance towards a preferred planning alternative. Results are shown in Table 7-10. To allow for traffic operations along Laird Drive and Eglinton Avenue to function acceptably during peak hours, further reductions in development size, improvements to alternative modes of travel, reductions in travel demand or additional road capacity is required. One of the key constraints is eastbound along Eglinton Avenue in the AM peak hour east of Laird Drive past Brentcliffe Road.

Table 7-10: Development Size and Mode Split Testing

Scenario Vehicle / Transit + Active	Link/Segment Volumes - AM (PM)	Residential Percentage of Part A Developments							
		25%		50%		75%		100%	
		1820 Residents		3640 Residents		5460 Residents		7280 Residents	
		SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB
~50%/50%	Laird South of Vanderhoof	1300 (1100)	1410 (1660)	1330 (1120)	1420 (1690)	1360 (1140)	1420 (1720)	1390 (1160)	1430 (1750)
	Laird South of Industrial	930 (840)	1230 (1270)	980 (850)	1230 (1320)	1590 (850)	2400 (1360)	1080 (860)	1240 (1410)
	Eglinton East of Laird	1580 (2110)	2270 (2000)	1580 (2130)	2330 (2010)	1730 (2160)	2710 (2020)	1590 (2180)	2460 (2030)
	Eglinton East of Brentcliffe	1720 (2150)	2400 (2180)	1720 (2200)	2550 (2180)	1730 (2250)	2710 (2190)	1730 (2310)	2870 (2200)
~40%/60%	Laird South of Vanderhoof	1270 (1050)	1370 (1620)	1300 (1070)	1370 (1650)	1320 (1090)	1380 (1680)	1340 (1100)	1380 (1700)
	Laird South of Industrial	910 (820)	1200 (1230)	950 (820)	1200 (1270)	990 (820)	1200 (1310)	1030 (830)	1210 (1350)
	Eglinton East of Laird	1560 (2070)	2220 (1970)	1560 (2090)	2270 (1980)	1570 (2110)	2330 (1990)	1570 (2140)	2380 (2000)
	Eglinton East of Brentcliffe	1690 (2100)	2320 (2140)	1690 (2150)	2460 (2140)	1690 (2190)	2590 (2150)	1700 (2240)	2720 (2160)
~30%/70%	Laird South of Vanderhoof	1230 (990)	1310 (1570)	1250 (1010)	1310 (1590)	1270 (1030)	1320 (1620)	1290 (1040)	1320 (1640)
	Laird South of Industrial	880 (790)	1160 (1190)	910 (790)	1160 (1220)	940 (790)	1160 (1250)	970 (790)	1160 (1280)
	Eglinton East of Laird	1540 (2030)	2160 (1940)	1540 (2050)	2200 (1940)	1540 (2070)	2240 (1950)	1540 (2080)	2280 (1960)
	Eglinton East of Brentcliffe	1650 (2050)	2230 (2090)	1650 (2090)	2330 (2100)	1660 (2120)	2430 (2100)	1660 (2160)	2530 (2110)

Based on these results, the further analysis of transportation strategies as documented in Section 8 were investigated to determine the potential of reducing travel demands and improve alternative modes of travel. Additionally, refinements to the land use demonstration plan were completed, with monitoring and phasing strategies to ensure that future developments do not exceed available capacity along key routes.

8 Transportation Strategies

The multi-modal analysis and iterative approach indicated that the vehicular capacity was the limiting constraint. As such, the overall multi-modal demand and associated policies/strategies will be important to a successful mobility plan solution.

To address the established overall objectives and guiding principles, this section tests potential impacts of different strategies on the draft emerging built form alternative as shown in Figure 8-1. The potential opportunities and solutions for the road network need to consider physical constraints such as the railway, heritage buildings, ROW availability, and the Don Valley ravine system. Furthermore, consideration of existing uses and demands were considered, included commercial vehicle movements, neighbourhood infiltration, and safety.

Figure 8-1: Draft Emerging Preferred Option for Study Area A for Testing

8.1 TDM Strategies and Policies

Policies to encourage non-auto travel demands and/or reduce travel during peak hours can also significantly reduce the number of vehicle trips during peak hours. However, these measures tend to have greater impacts on newer, mixed use developments, and would typically have low impacts on existing low density residential developments.

Furthermore, the potential impacts of TDM strategies and policies can significantly vary, dependent on regional destinations, changes in region-wide infrastructure, and other factors outside not directly related to changes within the study area. As a result, different mode-shares and trip reductions were tested. This allowed for a detailed assessment of the sensitivity of the road network to the success of TDM measures, thereby allowing for its implementation and monitoring plan that helps better understand development and its impact on mobility.

8.1.1 Mode Share

There are opportunities to increase active transportation and transit mode shares to a level that would sustain the proposed development. A more refined testing of mode shift scenarios was conducted on the preferred option as shown in Table 8-1.

The success of individual policies and strategies may be different to the overall outcome of the full set of recommended policies and strategies. As a result, the intent of this sensitivity testing was to ensure that key breakpoints in terms of vehicle capacity are understood. It is shown that reducing vehicular mode shares to 30% or lower will be integral to allowing the full development and corresponding preferred built form to proceed.

Table 8-1: Mode Share Sensitivity Testing

Scenario Vehicle/ Transit+Active	Link/Segment Volumes - AM (PM)	Capacity Available Per Direction	Preferred Built Form (Area A - 7135 Residents)	
			SB/WB	NB/EB
~45%/55%	Laird South of Vanderhoof	1000-1500	1360 (1150)	1420 (1740)
	Laird South of Industrial	1000-1500	1050 (850)	1230 (1380)
	Eglinton East of Laird	2000-2500	1600 (2160)	2410 (2030)
	Eglinton East of Brentcliffe	2000-2500	1730 (2270)	2780 (2200)
~40%/60%	Laird South of Vanderhoof	1000-1500	1340 (1120)	1400 (1710)
	Laird South of Industrial	1000-1500	1030 (840)	1220 (1350)
	Eglinton East of Laird	2000-2500	1590 (1160)	2380 (1600)
	Eglinton East of Brentcliffe	2000-2500	1710 (2240)	2710 (2170)
~35%/65%	Laird South of Vanderhoof	1000-1500	1320 (1100)	1370 (1700)
	Laird South of Industrial	1000-1500	1000 (830)	1190 (1350)
	Eglinton East of Laird	2000-2500	1570 (2140)	2320 (2000)
	Eglinton East of Brentcliffe	2000-2500	1690 (2240)	2610 (2160)
~30%/70%	Laird South of Vanderhoof	1000-1500	1290 (1060)	1340 (1650)
	Laird South of Industrial	1000-1500	970 (800)	1170 (1280)
	Eglinton East of Laird	2000-2500	1560 (2090)	2270 (1970)
	Eglinton East of Brentcliffe	2000-2500	1670 (2160)	2530 (2120)

8.1.2 Travel Demand Reduction

It is also possible to further reduce the overall number of trips made during the peak hour. Given that the main vehicle capacity constraint is during the AM peak hour, options to encourage off-peak travel, telecommuting or other strategies may be effective in lowering overall demands. Alternative development profiles, which attract different types of tenants

(students, seniors, lower income, etc.) would also reduce peak hour demands. The existing trip rate used reflects the current trend in the existing study area. More developed urban environments, such as that along Yonge Street, near Finch Station, show much lower travel demands as shown in Table 8-2.

Table 8-2: Potential Future Residential Trip Rate

Period	Study Area TTS Zones (217, 219, 220)	Comparable Future – Finch Station TTS Zone (450)
AM Rate	0.33	0.19
PM Rate	0.23	0.16

It is likely given the potential emerging urban character that vehicular demand reduction could be in the range of 30-40% in the long-term (i.e. similar to Finch Station, and other downtown Toronto neighbourhoods. Recognizing that this vehicular trip reduction transition would occur over a long period of time, a conservative projection for future trip generation of a 5% reduction was initially assumed. As the overall development moves towards completion, a 10% reduction in demand could be realistic if policies to encourage lower travel demands are implemented. Monitoring on the effectiveness of the adopted TDM measures is a critical requirement.

8.2 Transit Network

The existing feeder bus network is expected to be re-evaluated by the TTC and changed to accommodate the ECLRT when completed. However, the existing capacity constraints, and potential increases to these routes based on the existing ridership with minor adjustments was assessed to provide a high-level understanding of the feeder bus network. Projected transit demands and capacity based on this study's proposed development are shown in Table 8-3 and Table 8-4 for the AM and PM peak hours.

In general, some existing bus routes with low capacity, such as the 56 Leaside, may need an increase in bus service to accommodate future development and demand from the Laird Station. In general, however, the proposed demands during the peak hour can be accommodated with a feeder bus network similar to the existing service levels.

The quality of service, and connectivity to stops will have an impact on proposed transit routes. As a result, bus bays should be placed strategically to connect key destinations, facilitate bus operations, and to allow for the implementation of transit signal priority at key locations, including queue jumping opportunities.

Table 8-3: Projected AM Peak Hour Transit Demands and Capacity

AM Peak Hour		Existing		Future Total (40%/60%)		Existing Capacity	
Route	Location	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
ECLRT (projected ridership upstream and downstream from Laird Station)	West Side (Near Bayview)	2400	5550	2578	6328	7200	7200
	East Side (Near Leslie)	2050	4900	2337	5264	7200	7200
Feeder Bus along Eglinton Avenue (Leslie and/or other routes)	West Side (Near Bayview)	50	50	67	84	200	200
	East Side (Near Leslie)	50	50	84	67	200	200
56 Leaside	South Side (Near Millwood)	204	38	344	313	300	300
88 Leaside	West Side (Near Millwood)	30	73	49	130	200	200
	East Side (past CPR)	14	26	25	42	200	200

Table 8-4: Projected PM Peak Hour Transit Demand and Capacity

PM Peak Hour		Existing		Future Total (40%/60%)		Existing Capacity	
Route	Location	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
ECLRT (projected ridership upstream and downstream from Laird Station)	West Side (Near Bayview)	5550	2400	6169	2667	7200	7200
	East Side (Near Leslie)	4090	2050	4544	2278	7200	7200
Feeder along Eglinton (Leslie and/or Other)	West Side (Near Bayview)	50	50	78	74	200	200
	East Side (Near Leslie)	50	50	74	78	200	200
56 Leaside	South Side (Near Millwood)	57	103	170	199	300	300
88 Leaside	West Side (Near Millwood)	59	22	103	39	200	200
	East Side (past CPR)	40	17	71	30	200	200

8.3 Road Network

Projected vehicular demands are shown in Figures 8-2 and 8-3. Capacity constraints is identified along Laird Drive south of Eglinton Avenue and these issues can be addressed by providing additional north-south linkages south of Eglinton Avenue through the proposed development. With improved north-south connections between Wicksteed Avenue and Eglinton Avenue, users would have alternative routing choices and capacity constraints along Laird Drive would be reduced.

Eglinton Avenue near Brentcliffe Road is another constraint area, particularly for eastbound movements during the AM peak hour. Additional roadway capacity options are difficult to provide here due to the existing Don Valley ravine system, and rail corridor. Improvements along existing roadways, such as Wicksteed Avenue, could improve east-west roadway capacity.

Figure 8-2: Projected AM Peak Hour Vehicle Flow

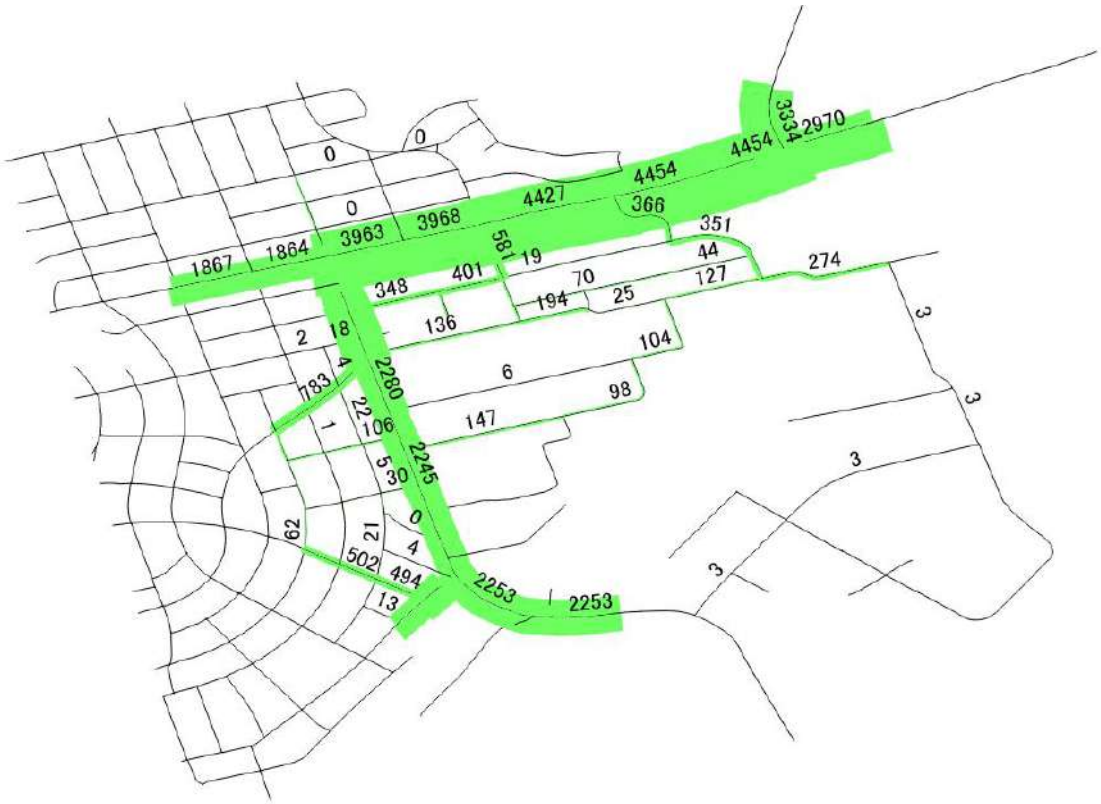
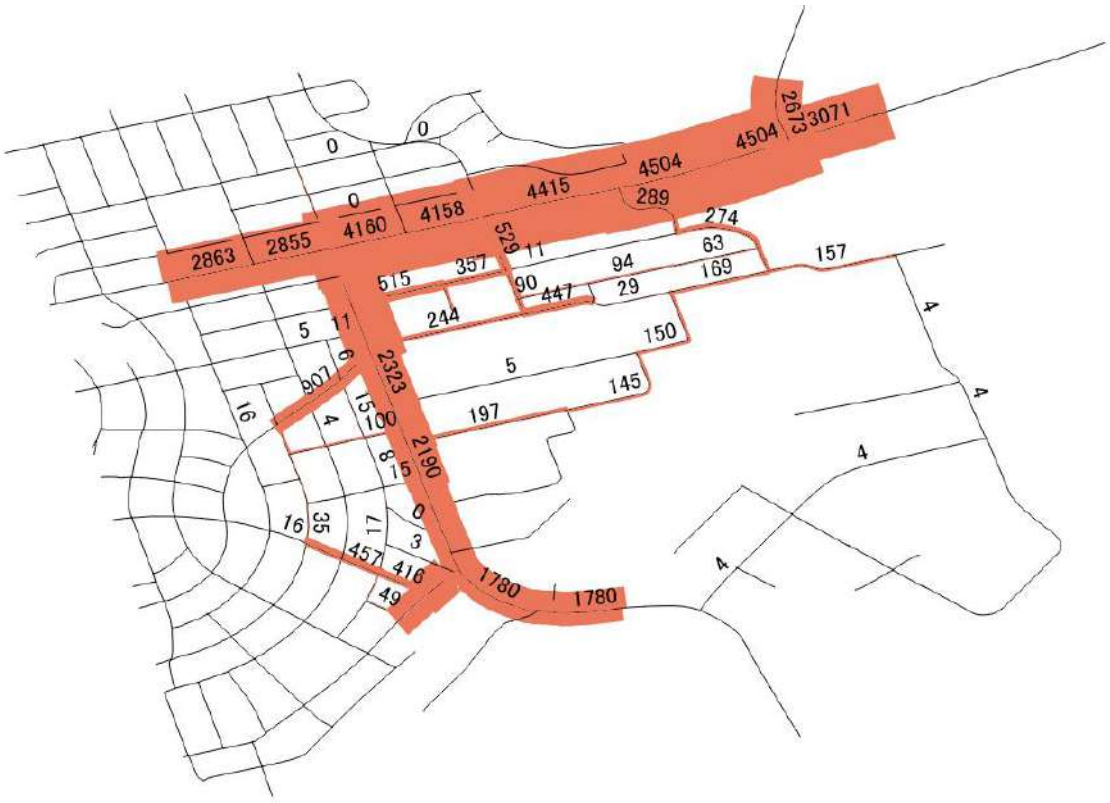


Figure 8-3: Projected PM Peak Hour Vehicle Flow



8.3.1 Traffic Operations

Future traffic operations analysis was conducted to review key signalized intersections in the study area. This was completed to assist in the development of the functional plan, including confirmation of lane configurations and turn lane storage lengths.

For the fully implemented development build-out, an initial test of traffic operations with the base assumptions for mode shares (i.e. 40% vehicular mode split and 5% travel demand reduction) indicated some capacity constraints at these intersections.

Additional analysis indicated that the implementation of 80% of Study Area A's residential development build-out, development traffic could be accommodated by the planned road network. Table 8-5 and Table 8-6 present projected AM and PM peak hour traffic operations with 80% of Study Area A's development traffic.

To be noted, these analyses are high level based on several land use and transportation planning assumptions. As development occurs with specific proposals being made, these assumptions need to be reviewed for consistency and for impact on other developments. As mentioned for TDM strategies, monitoring of the transportation network based on subsequent development implementation will be critical.

Table 8-5: Projected AM Peak Hour Traffic Operations

Intersection	Intersection LOS	Critical Movements			
		Movement	LOS	V/C Ratio	95th Percentile Queue (m)
Laird Dr & Eglinton Ave	F	EBT	F	1.71	492.0
		WBL	F	1.89	396.0
		NBT	F	1.37	244.0
		SBT	D	0.17	30.0
Eglinton Ave & Don Avon Dr	C	EBT	C	0.94	277.0
		NBT	E	0.88	107.0
Brentcliffe Rd & Eglinton Ave	F	EBT	F	1.25	436.0
		WBL	F	1.05	78.0
		NBL	D	0.03	6.0
Laird Dr & Vanderhoof Ave	B	WBL	E	0.92	87.0
Laird Dr & McRae Dr	D	EBL	E	0.79	96.0
		WBL	F	1.17	116.0
		NBL	F	1.19	45.0
		SBT	F	0.95	308.0

Table 8-6: Projected PM Peak Hour Traffic Operations

Intersection	Intersection LOS	Critical Movements			
		Movement	LOS	V/C Ratio	95th Percentile Queue (m)
Laird Dr & Eglinton Ave	F	EBT	F	1.26	381.0
		WBL	F	1.27	231.0
		NBT	F	1.09	171.0
		NBR	D	0.79	182.0
		SBT	D	0.04	11.0
Eglinton Ave & Don Avon Dr	C	EBT	B	0.88	172.0
		WBL	F	0.86	24.0
		WBT	C	0.93	210.0
		NBT	D	0.56	48.0
Brentcliffe Rd & Eglinton Ave	D	EBT	E	1.09	354.0
		WBL	E	0.80	41.0
		WBT	C	0.97	340.0
		NBT	D	0.02	5.0
		NBR	D	0.71	96.0
Laird Dr & Vanderhoof Ave	C	WBT	D	0.85	114.0
		SBT	B	0.95	70.0
Laird Dr & McRae Dr	C	EBL	E	0.99	102.0
		WBL	D	0.80	68.0

8.3.2 Neighbourhood Infiltration

Concerns with neighbourhood infiltration was highlighted by many residents during various consultation activities. In order to continue to support the existing neighbourhoods to the north of Eglinton Avenue and west of Laird Drive, the new signalized intersections would be designed to restrict through movements into these neighbourhoods. This includes the intersection of Vanderhoof Avenue and Laird Drive, as well as Eglinton Avenue and Don Avon Drive. In addition, horizontal and vertical deflections at designated local streets will be implemented.

8.3.3 Goods Movement

The existing conditions assessment and stakeholder input highlighted a need to maintain truck access to the employment lands area. To safely accommodate truck movements, a number of strategies will be adopted: identify designated truck routes where appropriate designs can be incorporated; provide dedicated turn lanes; and, provide larger receiving lanes and turning radii at key intersections for the preferred truck routes.

8.4 Pedestrian Network

Pedestrian flows for the AM and PM peak hours are shown in Figures 8-4 and 8-5. These figures show that there is significant demand to and from the ECLRT Laird Station and nearby transit stops. This leads to a high pedestrian volume along Laird Drive, between Eglinton Avenue and Vanderhoof Avenue in the AM and PM peak hours.

Improved connectivity, specifically north-south connections within Study Area A will allow pedestrians to utilize the new local streets. However, even with this consideration, most of the transit demand in the AM peak hour will be headed westbound. A large volume of pedestrian would cross or access the intersection of Eglinton Avenue and Laird Drive and it should be designed to enhance pedestrian comfort and safety. Furthermore, where possible, crossing distances should be minimized, and crosswalk widths increased.

Figure 8-4: Projected AM Peak Hour Pedestrian Flow

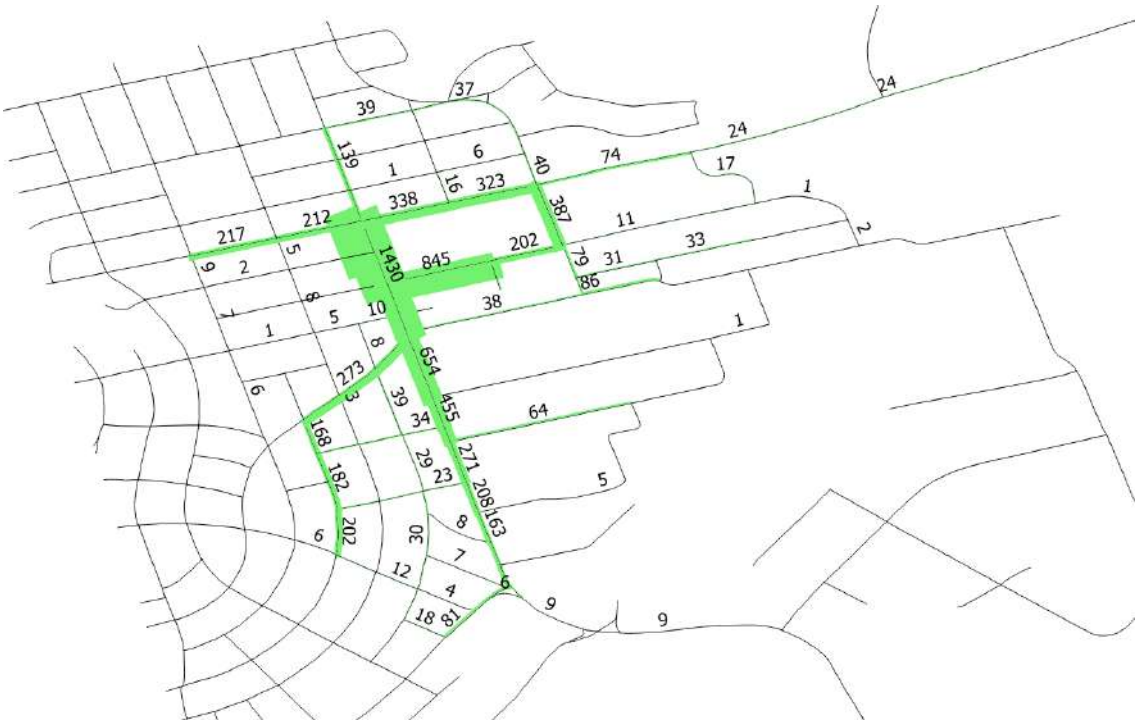


Figure 8-5: Projected PM Peak Hour Pedestrian Flow

8.5 Cycling Network

Projected cycling volumes along each roadway is shown in Figure 8-6 and Figure 8-7. The volume does not take into consideration recreation cycling traffic during non-peak hours, particularly those accessing the ravine system trails to the east of the study area. The desire for a connection to the Don Valley ravine system was highly supportive during the consultation activities.

There is a need for improved cycling infrastructure and linkages to other parts of the City's network. A cycling option along Laird Drive and Vanderhoof Avenue would provide a connection to the existing network and planned destinations. The City's 10 Year Cycling Plan should be amended to reflect Laird Drive and Vanderhoof Avenue as the preferred streets for cycling infrastructure.

Cycle tracks would provide a high level of comfort and safety for both commuter and recreational cyclists, and is recommended for Laird Drive. An off-street multi-use path along Vanderhoof Avenue and a small segment of Brentcliffe Road, would provide access to proposed parklands within the planned development blocks and to the Don Valley ravine system areas east of the study area.

Cycling parking amenities at transit stations and key destinations should be provided.

Figure 8-6: Projected AM Peak Hour Cycling Flow

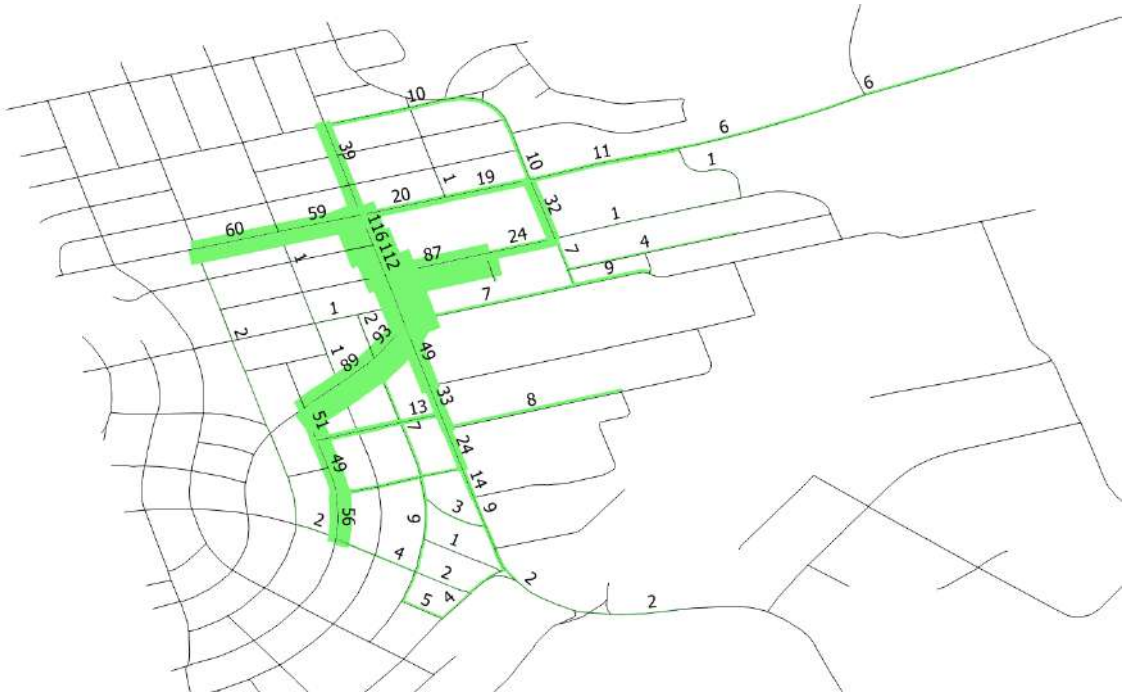


Figure 8-7: Projected PM Peak Hour Cycling Flow

8.6 Parking Strategies

Progressive parking strategies will ensure that new developments attract non-auto oriented residents and employees.

However, a minimum number of parking spaces is still required to support current uses, and ensure that overspill parking does not negatively impact existing neighbourhoods.

8.6.1 Minimum Parking Rates – Residential

Situated along a major transit corridor, it would be expected that both Study Areas A and B would follow Policy Area 2/3 as per City guidelines for parking supply requirements. This is consistent with the approved development at 939 Eglinton Avenue. Table 8-7 shows the required parking spaces per unit type for residential developments based on this requirement.

Table 8-7: City Residential Parking Policy

	1 Bedroom	2 Bedroom	3 Bedroom	Visitor (per Unit)
Policy Area 2/3 - Spaces per Unit	0.7	0.9	1.0	0.1

Residential parking spaces, which are typically owned by individual unit owners are still recommended to be provided on site within individual buildings. Although a shared lot is possible if centrally located, there is minimal benefits to doing so as it does not reduce overall parking provision requirements. However, given the small study area and the proposed location of a public community centre, it would be recommended that a centralized parking facility be located here. This would not only provide adequate access for the entire study area, but also is close to the transit station, thereby providing parking for transit as well.

8.6.2 Minimum Parking Rates – Non-Residential

Table 8-8 indicates the required parking supply for each of the non-residential land uses proposed within both study areas.

Table 8-8: City Non-Residential Parking Policy

Land Use	Space Per 100 Square Meters
Office	1.0
Retail	1.0
Community	0.5

To reduce the overall parking demand and to permit better sharing of parking uses, it is recommended that non-residential parking be shared among all developments within Study Area A. The benefits are:

- Ability to fully utilize parking spaces throughout the day by unlocking synergies between multiple uses (office, retail, and community facility);
- Flexibility to adjust pricing strategies to improve mode-share changes within the area;
- Flexibility to incorporate and adjust to future technologies, car-share spaces; and,
- Improved ability to change parking supply as mixed developments come online.

The City has established percentages for office, retail, and community facility parking. The AM/PM/Evening utilization of parking spaces for each use are as follows:

- Office – 100% /60% / 0%
- Retail – 20% / 100% / 100%
- Community – 25% / 100% / 100%

Therefore, for non-residential uses, the parking supply should be the maximum required parking demand in either the AM, PM, or Evening periods. The preferred plan would require the following parking spaces:

- Office: 23,960 sq m – 240 spaces
- Retail: 17,420 sq m – 174 spaces
- Community: 2,950 sq m – 15 spaces
- Total = 429 spaces

With shared parking, the PM period would require the highest parking supply, but only result in a total of 334 parking spaces.

8.7 Shared Mobility

Shared vehicles and cycling promotes additional reductions in vehicle ownership rates, and provides improved mobility choice. Study Area A has a high potential for implementing shared mobility hubs that include shared vehicles and/or shared cycling facilities.

8.7.1 Bike Share

Three locations are currently identified as potential bike share locations. One is to be located at the southeast corner of Eglinton Avenue and Laird Drive, providing access to and from the proposed ECLRT station. The second location is in the vicinity of Brentcliffe Road and

Vanderhoof Avenue, which provides access / choice for the planned, using the proposed multi-use paths, to access destinations to the west (community centre, retail, transit, etc.) and the Don Valley ravine system to the east for recreational cycling.

A third location is proposed at the existing Leaside Memorial Gardens community centre, located at the intersection of Laird Drive and Millwood Road, with a potential gateway treatment. A potential fourth location, subject to available property after appropriate gateway landscape treatments, is the southwest corner of McRae Drive and Laird Drive.

8.7.2 Car Share

Car-share spaces should be provided at a centralized location for both residential and non-residential users in Study Area A. Typically, car share usage occurs within 500m of a car share facility. As development occurs south of Vanderhoof Avenue in the future, additional car-share stations could be considered to facilitate use by existing neighbourhoods and new developments.

8.7.3 Rideshare

Ride sharing could reduce the number of vehicle trips by increasing the number of passengers per vehicle, thus accommodating the same overall trips with fewer vehicles. The effectiveness of ridesharing can vary depending on many mobility and economic factors, but it is an important mode choice to be considered. Public and private infrastructure should be designed to create convenient pick-up/drop off locations for employers, schools and residential developments.

9 Recommended Mobility Plan

The study and surrounding areas was planned primarily for cars and trucks. Combined with a lack of a fine-grained network and the presence of many physical barriers (i.e. railway corridor, large property parcels, and ravine system), the street network is disconnected. Thus, a challenging pedestrian and cycling environment exists. This further encourages people to drive, creating further traffic delays, congestions and safety issues.

The transportation review and multi-modal analysis confirms that the major investment into the Eglinton Crosstown LRT (ECLRT) line will significantly improve regional and local mobility, directly with enhanced higher-order and connected feeder bus transit options, and indirectly with supportive multi-modal access and shared mobility strategies.

Short-term opportunities for the area include the introduction of cycling facilities, which currently do not exist. A network of dedicated cycle tracks and multi-use pathways can provide efficient connections between key local destinations such as the future LRT station, community facility, and new and existing parks. The network should also connect to the larger cycling system that is comprised of the future Eglinton Avenue cycle track, the existing Millwood Road bicycle lanes, and the Don Valley ravine system.

Support for employment uses includes the identification of specific truck routes to facilitate movement within and beyond the Leaside Business Park. These routes tie into the larger arterial and highway road system and should be designed to minimize pedestrian and cyclist conflicts with heavy vehicles while also ensuring truck movement is efficiently realized.

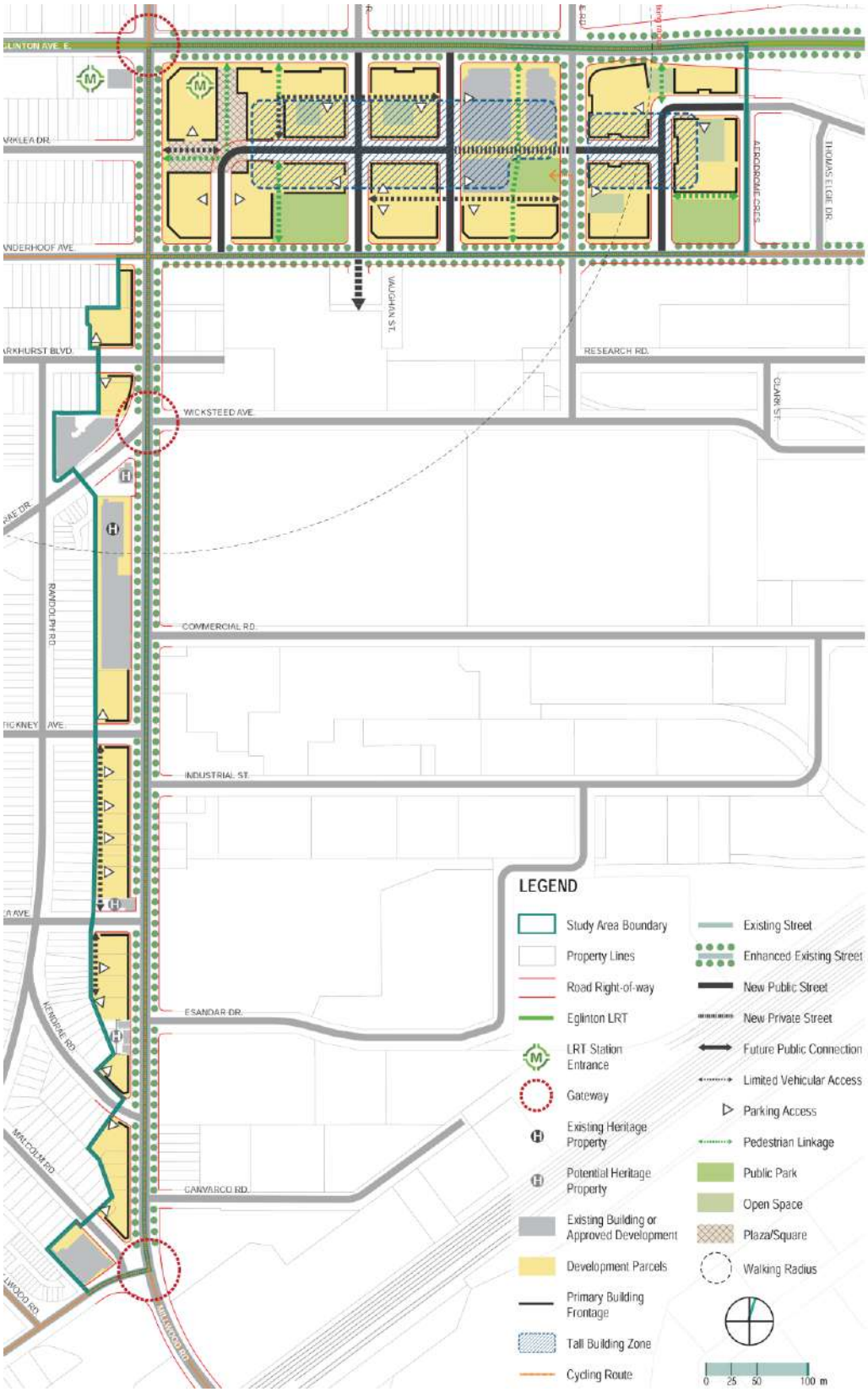
Correspondingly, emerging City-building initiatives will present opportunities to integrate new residential and employment intensification, including an enhanced public realm and community facilities. As such, this integrated planning process considered safe mobility access and choice in the development of the overall planning framework. This is evidenced by the several transportation-related references in the Laird in Focus Vision Statement and the associated principles, and in five of the ten identified “Big Moves” for the study.

Figure 9-1: Study Area and Context

9.1 Shifting Away from Vehicles – A Balanced Approach

Once ECLRT is operational, a transformation in travel modes will occur, locally and regionally. The degree which future travel moves away from vehicles however, will be measured by how well we achieve a balanced and integrated multi-modal transportation network. Critical for success will be enhanced access and connections to ECLRT, that includes reliable and convenient local transit, and safe and comfortable walking and cycling facilities.

Figure 9-2: Recommended Integrated Built Form and Transportation Structure Plan



Based on multi-modal analysis and extensive consultation, a long list of mobility recommendations has been identified to transform the study area from car-dependent travel to transit and other modes. Central to most of the recommendations were re-imagining Laird Drive and guiding new development to be non-auto based.

Laird Drive will become a central spine in the area, unifying existing residential neighbourhoods, retail uses and employment areas with an attractive multi-modal transportation corridor. It connects existing and planned community centres, has major bus routes and provides access to the vital employment lands. Existing cycling routes lack safe connectivity to the Leaside neighbourhoods and beyond the study area to the network. Further, existing sidewalks and boulevards are generally unattractive, due to narrow widths, utility pole locations, numerous driveway depressions, and limited greenery and amenities.

The re-imagined Laird Drive is highlighted by implementing continuously on both sides a grade-separated cycle track facility and wide sidewalks. Boulevard widths are optimized for streetscape greening and street furniture, with additional width generally provided along the west side to integrate with emerging mixed-use development. Another key design component is integrating the bus stops into the boulevards, ensuring that shelters, street furniture / seating, shade, lighting, and bike parking, are incorporated to enhance the comfort of transit patrons. This is being achieved while maintaining reasonable traffic operations, including goods movement via trucks, within the established right-of-way.

Guiding the emerging neighbourhood along Eglinton Avenue is largely founded on implementing a finer grain street network to provide choice for how people will move around and access to where people want to go. Additional safe and comfortable mid-block connections will be encouraged through the development blocks to improve permeability. With a green and attractive setting and a resulting lower speed environment the following attributes will be achieved:

- increased pedestrian and cycling activity with safe, comfortable and attractive conditions;
- enhanced and convenient access and connectivity to transit; and,
- alternative routing choices that connect to the surrounding street network, that will distribute vehicular trips within the study area.

The extent of a mode shift to active transportation and transit will be magnified by the success of a travel demand management (TDM) program and associated innovative mobility strategies. The recommended mobility plan promotes TDM to promote travel demand measures and technological advances that will ensure additional travel choice to single occupant vehicular travel, including adding capacity to the network without expansion. Smart Commute programs, school trip planning, parking maximums and development-related benefits should be the minimal expectations to provide modest reduction on vehicle trips. Enhanced and progressive TDM measures are continuously being advanced with technology, presenting significant opportunities. Monitoring of the transportation network as development occurs is critical, to ensure that trips are being diverted to transit and the effectiveness of the adopted TDM program, but also when / if further transportation infrastructure is required.

In embracing a multi-modal transportation approach that is sustainable and balanced, redefining the transportation mode hierarchy is required. The following transportation mode hierarchy has been adopted, consistent with the City's policies:

- **Active transportation** – walking and cycling modes provide both health and infrastructure capital and operating cost benefits.
- **Transit network** – higher-order transit lines, such as the Eglinton Crosstown, provide significant opportunities to not only impact regional trip choices away from vehicles, but also to facilitate development that is active transportation supportive. Further, feeder bus networks can be effectively planned to connect higher-order transit lines with residential communities and employment districts.
- **Transportation demand management (TDM) and innovative mobility strategies** – adopting TDM and technological advances, accepting emerging governance structures, supporting shared arrangements, and encouraging / incentivizing societal behaviour changes directly present infrastructure cost benefits, but also fulfils a need for non-peak travel periods.
- **Goods movement** – supporting the vitality of employment lands is critical to an economically sustainable City.
- **Vehicular movement and associated parking** – it is recognized that vehicles and parking will remain essential elements of a transportation network, however to accommodate future transportation demands, major infrastructure costs and quality of life impacts will be presented. Shifting away from vehicular trips is necessary for a sustainable and balanced transportation system within a vibrant City.

Recognizing the benefits of an integrated multi-modal transportation system, the recommended mobility plan also reinforces low-carbon options, while addressing environmental and health benefits, and societal equity in mobility planning for all users.

Based on analysis and extensive consultation, the following mobility recommendations are presented, that will transform the study area from car-dependent travel to other modes, and most predominantly to transit.

9.1.1 Pedestrian Network

Providing a high quality and safe pedestrian network will help to promote shorter trips by enhancing travel choice, provide access and connectivity to where people want to go, and improve the quality of the pedestrian experience.

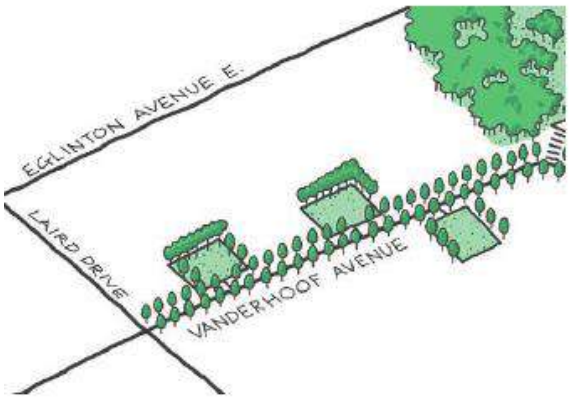
Recommendation 1. Implement recommendations along Eglinton Avenue as per EGLINTONconnects.

Recommendation 2. Implement a finer grain street network that includes generous sidewalks on both sides of new and existing streets. This will provide choice for how people will move around and will emphasize safe and comfortable walking. Streets will provide a green and comfortable setting for all users and activities. These local streets will have lower travel speeds and primarily provide only local access supporting an increase level of pedestrian activity. Additional safe and comfortable mid-block connections are encouraged through the development blocks to improve permeability. The implementation of a finer grain street network will occur in phases as redevelopment happens to improve linkages and connectivity to facilitate a mode shift to active transportation, and support access to all transit.

Recommendation 3. Establish a new east-west mid-block green street that will act as a connector from residential areas to destinations. Destinations include the transit station, the existing and planned community centres, and emerging retail and office uses. With an attractive public realm treatment, the new street will be pedestrian-friendly with a focus on intimate passive activities in comparison with Eglinton Avenue.

Recommendation 4. Transform Vanderhoof Avenue into a greenway spine. This will connect the existing Leaside neighbourhood and the planned developments with new and existing parks, as well as the Don Valley trail system to the east. This greenway spine will have a widened north boulevard comprising of a generous 2.1 m sidewalk, and a 3.0 m multi-use path buffered with additional greenery. The widened boulevard and associated buildings setback present a walking and cycling environment that is appropriate for all users and age, while establishing a clear transition to the remaining employment lands to the south.

Figure 9-3: Green Street Concept



Recommendation 5. Provide generous and continuous wide sidewalks along both sides of Laird Drive (2.1 m), including optimizing boulevard widths for streetscape greening and street furniture.

Recommendation 6. Incrementally enhance the pedestrian environment and safely connect to the enhanced pedestrian network within the employment lands as redevelopment occurs with the provision of sidewalks on both sides.

Recommendation 7. Implement City of Toronto's Vision Zero road safety plan to improve safety for pedestrians. Specific measures include:

- narrowing all roadway lane widths to minimize crossing walking distances;
- introduce a new signalized intersection at Laird Drive and Vanderhoof Avenue to facilitate safe Leaside neighbourhood access to the transit station, community centre, emerging retail and office uses, and existing and planned parks;
- for local roads into the Leaside residential neighbourhoods, introduce curb extensions consisting of a narrowed roadway and a

tighter radius, and a raised textured intersection profile – for pedestrians there will be an increased storage area at the intersection corners and a shorter crossing walking distance, while vehicular traffic will require lower speeds;

- remove existing Laird Drive medians which encourage unsafe mid-block pedestrian crossing, but investigate new controlled pedestrian crossings at key intersection or mid-block locations;
- modify signalized intersection configuration at Laird Drive and McRae Drive to remove traffic island and to reduce radii, including potential turning restrictions, to shorten the walking distances and reduce vehicular speeds at this highly pedestrian-active intersection;

Figure 9-4: Laird and McRae Treatment Option

- through roadway design and placement of utilities, encourage truck movement along preferred corridors, thereby reducing potential conflict with pedestrians;
- provide wider crosswalks (6 m) at crossing with anticipated high pedestrian volumes (i.e. Eglinton Avenue and Laird Drive, Laird Drive and Vanderhoof Avenue), and correspondingly ensure larger pedestrian storage areas with wider boulevards and building setbacks;
- promote active transportation along Brentcliffe Road on the west side to avoid significant northbound turning truck movements at Eglinton Avenue; and,
- provide continuous uninterrupted sidewalks across driveways and minor unsignalized intersections.

9.1.2 Cycling Network

Cycling trips will be promoted and better supported, particularly for short to moderate length trips, by enhancing travel choices that support safe and comfortable connections to the existing and planned cycle network.

Recommendation 8. Implement grade-separated cycle track recommendations along Eglinton Avenue as per EGLINTONconnects.

Recommendation 9. The finer grain street network consisting of new east-west and north-south streets, and associated mid-block connections through development blocks, present a lower speed environment that is cycling-friendly. The implementation of a finer grain street network will improve linkages and connectivity to facilitate a mode shift to active transportation, and support access to all transit.

Recommendation 10. Undertake a refinement to the City's 10 Year Cycling Network Plan, that includes a continuous grade-separated cycle tracks along Laird Drive between Eglinton Avenue and Millwood Road, and a continuous off-street multi-use path along Vanderhoof Avenue between Laird Drive and the Don Valley trail system.

Figure 9-5: Cycling Connections

Recommendation 11. Transform Vanderhoof Avenue into a greenway spine connecting the existing Leaside neighbourhood and the planned development with new and existing parks, as well as the Don Valley trail system to the east. This greenway spine will have a widened north boulevard comprising of a generous 2.1 m sidewalk, and a 3.0 m multi-use path buffered with additional greenery. The widened boulevard and associated buildings setback present a walking and cycling environment that is appropriate for all users and age, while establishing a clear transition to the remaining employment lands to the south.

Recommendation 12. Implement continuous grade-separated cycle tracks along Laird Drive, completing a critical section of the cycling network between Eglinton Avenue and Millwood Road, which will provide safe and comfortable

connections to transit and community facilities. In addition, this key connection will improve connectivity beyond the study area, including the adjacent Leaside neighbourhoods.

Recommendation 13. Incrementally enhance and safely connect to the refined and broader cycling network within the employment lands as redevelopment or capital works occurs with the provision of buffered cycling facilities.

Recommendation 14. Provide public bicycle parking spaces along the key cycling routes and at key destinations, such as transit station entrances and community facilities, to provide increased opportunities to secure bicycles in the area.

Recommendation 15. Coordinate with the Toronto Parking Authority, and developers and landowners to create a bike share network in the area. This will promote movement between key destinations, such as transit facilities, community and park facilities, and area businesses.

Recommendation 16. Encourage cycling usage through the development process by: a) securing above minimum long-term on-site bike parking; b) providing development-related cycling benefits; c) promoting the implementation of cycling repair stations in the area; d) including educational training programs for all users and ages.

Recommendation 17. Implement the City of Toronto's Vision Zero road safety plan. In addition to implementing the City of Toronto's Vision Zero road safety plan and related pedestrian safety measures, adopted cycling safety measures include implementing bike boxes for safer turning movements for on-street to on-street cycling facility movements, and consistent integrated cycle track treatment at bus stop locations.

Figure 9-6: Streetscape Concept

9.1.3 Transit Infrastructure

Improving the experience and amenities of the local feeder bus network along with the opening of the ECLRT will shift travel from private vehicles to more transit usage. In addition, enhanced active transportation access and connectivity to transit will support this mode shift to transit.

Recommendation 18. Coordinate with the Toronto Transit Commission regarding bus stop locations and associated design requirements. Bus bays and associated amenities need to consider potential routing, timed layover locations, and potential vehicle type / length. Shelters will be provided at all bus stop locations.

Recommendation 19. Implement the recommended two-bus bay along Eglinton Avenue as per EGLINTONconnects.

Recommendation 20. Implement bus bay locations for timed layover and / or at anticipated high volume of passengers getting on and off locations. In addition to the two-bus bay along Eglinton Avenue, other identified locations include: a two-bus bay along Brentcliffe Road in the southbound direction south of Eglinton Avenue; a two-bus bay along Vanderhoof Avenue in the westbound direction east of Laird Drive; and a two-bus bay along Laird Drove in the southbound direction south of Eglinton Avenue.

Recommendation 21. Adopt integrated bus stop treatments with the planned cycle tracks. Maintaining the cycle track facility separate and in front of the bus stop waiting area / shelter is preferred.

Recommendation 22. Provide proper integration of transit facilities with development where appropriate.

Recommendation 23. To improve passenger comfort, in addition to shelters at all bus stop locations, other amenities such as additional shelters, street furniture / seating, shade, lighting, and bike parking, should be included, particularly at anticipated high volume of passengers getting on and off locations.

Recommendation 24. Explore the introduction of transit priority measures for the local feeder bus network, particularly near the transit station or at congested intersections, to provide a more reliable choice for commuters.

Recommendation 25. Improve active transportation connections to and from transit stations / stops by establishing a finer grain street network and mid-block linkages through the development process. Include associated wider crosswalks at anticipated high passenger volume locations.

Recommendation 26. Design the street network to minimize delay to bus movement, including appropriate intersection turning radius and avoiding

intersecting local streets on heavy travelled transit routes near the ECLRT station.

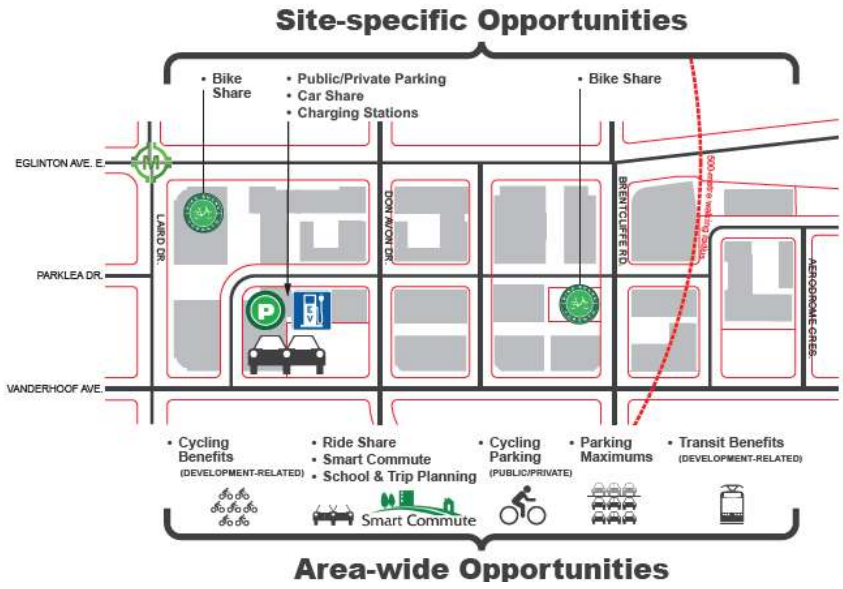
Recommendation 27. Encourage transit usage through the development process by providing development-related transit benefits, such as transit passes, real-time arrival display boards, and direct connections to the station.

9.1.4 Travel Demand Management (TDM) and Innovative Mobility Strategies

Transportation Demand Management (TDM) and innovative mobility strategies are to be encouraged. These strategies promote travel demand measures and technological advances that support alternatives to single occupant vehicular travel, adding capacity to the network without requiring its expansion.

Recommendation 28. Coordinate with Metrolinx Smart Commute program, developers, and businesses and related associations to incorporate a TDM plan to increase convenience and usage. Developers will be required to submit a comprehensive TDM plan and contribute to a TDM monitoring program. Encourage developers to incorporate trip planning techniques with the onset of their development marketing, working with Smart Commute to promote, educate and implement.

Figure 9-7: Shared Mobility and TDM Strategies



Recommendation 29. Coordinate with local school boards and school trip planning programs to incorporate new development requirements. Encourage developers to incorporate school trip planning techniques with the onset of their development marketing. Ensure that developers contribute to a TDM monitoring program.

Recommendation 30. Integrate publicly accessible parking infrastructure (i.e. Toronto Parking Authority) near the transit station and the proposed community centre, control parking supply, and implement other innovative mobility plan elements such as car-share and shared-bike facilities.

Recommendation 31. Secure TDM measures, electric vehicle charging infrastructure, and other Toronto Green Standards requirements in new developments through the development review process to reduce the number of vehicle trips.

9.1.5 Parking Strategies

The provision of parking will be planned to manage traffic volume growth and limit unnecessary car travel, thereby encouraging transit and alternative travel modes.

Recommendation 32. On-street parking along Laird Drive will not be permitted.

Recommendation 33. Parking for development along Laird Drive will be located underground or at the rear of the property, and accessed from the local streets, not from Laird Drive.

Recommendation 34. On-street short-term parking will be provided along the new east-west mid-block street that will support planned ground-level retail uses, and drop-off / pick-off functions near the transit station entrance and the proposed community facility.

Recommendation 35. Consideration for lower parking rates for new developments in concert with TDM strategies. Given the proximity to transit availability, population density and enhanced mobility options being introduced, lower parking rates will limit the supply of parking spaces and encourage non-auto trips.

Recommendation 36. Integrate publicly accessible paid parking spaces for all new developments, including along laird Drive.

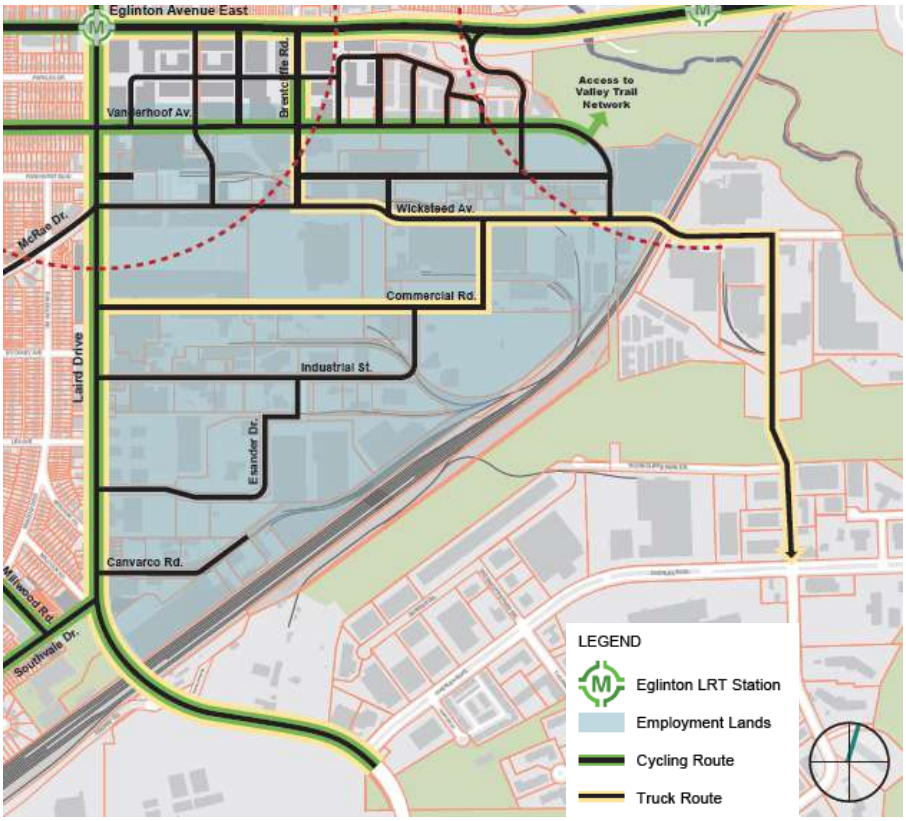
9.1.6 Goods Movement

Supporting the vitality of Employment Lands is critical to an economically sustainable city. The City recognizes the importance of the Leaside Business Park and is committed that the Leaside employment lands are to remain as “employment lands”, maintaining access to and from their operations. The mobility plan recommends a safe and balanced approach to maintaining the employment lands vital, while providing the opportunity for people to work, live and play locally.

The vitality of employment lands is critical to integrate growth with a supportive transportation system. The mobility plan recommends a safe and balanced approach to maintaining the employment lands vital, while providing the opportunity for people to work, live and play locally.

Recommendation 37. Support key truck / goods movement routes, consisting of arterial roadways to the Leaside Business Park (i.e. Eglinton Avenue, Laird Drive, Brentcliffe Road and Millwood Road), and internal roadway access via Commercial Road and Wicksteed Avenue, including the provision of truck turning radii and lanes where appropriate.

Figure 9-8: Proposed Truck Routes



Recommendation 38. Implement appropriate roadway / streetscape designs and utilities placement to reduce potential conflict with pedestrians and cyclists.

Recommendation 39. Goods servicing for the emerging new development along Eglinton Avenue will be accessed from the internal local roadways, preferably to underground facilities and / or to screened locations off the local roadways.

Recommendation 40. Goods servicing for development along Laird Drive will be at the rear of the property, accessed from the local streets, and not from Laird Drive.

Recommendation 41. Implement a southbound left turn lane along Laird Drive approaching Commercial Road to separate the primary truck entrance into the employment lands from other traffic to improve safety and ensure operational efficiency.

Recommendation 42. Incrementally enhance the pedestrian and cycling environment, by safely connecting to the enhanced transit and active transportation network within the employment lands as redevelopment occurs, to provide increased travel choice for employees and patrons.

Recommendation 43. Consider improvements to Wicksteed Avenue by providing additional roadway capacity and to facilitate goods movement.

9.1.7 Street Network

The development of this emerging neighbourhood will implement a finer grain street network, improving access and connectivity while facilitating a modal shift to active transportation and transit. This network will further provide alternative routing choices that connect to the surrounding street network, thereby distributing vehicular trips within the study area.

Recommendation 44. Implement recommendations along Eglinton Avenue as per EGLINTONconnects.

Recommendation 45. The emerging neighbourhood along Eglinton Avenue is to implement a finer grain street network that will provide alternative routing choices that connect to the surrounding street network, thereby distributing vehicular trips within the study area.

Recommendation 46. Development proponents must demonstrate to the City's satisfaction that the street network will function appropriately, and ensure capacity and access is available for the proposed development. Ensure that developers contribute to monitoring provisions that will assess TDM effectiveness and the actual diversion to the transit mode.

Recommendation 47. Laird Drive will be reconfigured between Eglinton Avenue and Millwood Road as a "Complete Street". The intent is to re-balance the existing vehicle-focussed functions with appropriate multi-modal uses while prioritizing key traffic movements. Specifically, this includes combining lanes to provide wider sidewalks, a continuous cycle track, and optimizing boulevard widths for streetscape greening and street furniture.

Recommendation 48. Vanderhoof Avenue roadway will introduce narrowed lanes to include a continuous left turn lane to ensure safe and efficient traffic operations given the existing offset roadways and driveways on both sides and projected large turning volumes.

Recommendation 49. Additional road capacity such as Wicksteed Avenue improvements are potentially required as development occurs, subject to actual TDM effectiveness and diversion to transit. Additional study would be required, but a preliminary concept envisions, as a minimum, a roadway widening from Brentcliffe Road to Millwood Road via Beth Nealson Drive, including a CPR grade separation.

Recommendation 50. Implement City of Toronto's Vision Zero road safety plan. Specific measures include:

- narrowing all roadway lane widths to minimize crossing walking distances;
- introduce a new signalized intersection at Laird Drive and Vanderhoof Avenue to facilitate safe Leaside neighbourhood access to the transit station, community centre, emerging retail and office uses, and existing and planned parks;

- for local roads into the Leaside residential neighbourhoods, introduce curb extensions consisting of a narrowed roadway and a tighter radius, and a raised textured intersection profile – for pedestrians there will be an increased storage area at the intersection corners and a shorter crossing walking distance, while vehicular traffic will require lower speeds;
- remove existing Laird Drive medians which encourage unsafe mid-block pedestrian crossing, but investigate new controlled pedestrian crossings at key intersection or mid-block locations;
- modify signalized intersection configuration at Laird Drive and McRae Drive to remove traffic island and to reduce radii, including potential turning restrictions, to shorten the walking distances and reduce vehicular speeds at this highly pedestrian-active intersection;

Figure 9-9: Improved Intersection Configurations

- provide widen crosswalks (6 m) an anticipated high pedestrian volume crossing (i.e. Eglinton Avenue and Laird Drive, Laird Drive and Vanderhoof Avenue), and correspondingly ensure larger pedestrian storage areas with wider boulevards and building setbacks;
- promote active transportation along Brentcliffe Road on the west side to avoid significant northbound turning truck movements at Eglinton Avenue; and,
- provide continuous uninterrupted sidewalks across driveways and minor unsignalized intersections.

9.2 Functional Concept Plan

A functional concept plan for the recommended mobility plan has been developed. The functional design of all roadways and rights-of-way has considered the proposed changes in use, intensity and character as the development occurs, and adheres to the Toronto Complete Street Guidelines (2016), the Toronto Green Technical Standards (2018), and numerous other City design standards. In addition, all new local streets will conform to Toronto's Development Infrastructure Policy and Standards (DIPS).

The functional concept plan drawings illustrating key components and associated typical sections are provided separately. The functional concept plan has been developed to an approximate 10% design level, at a scale of 1:1000 and typical sections at 1:100.

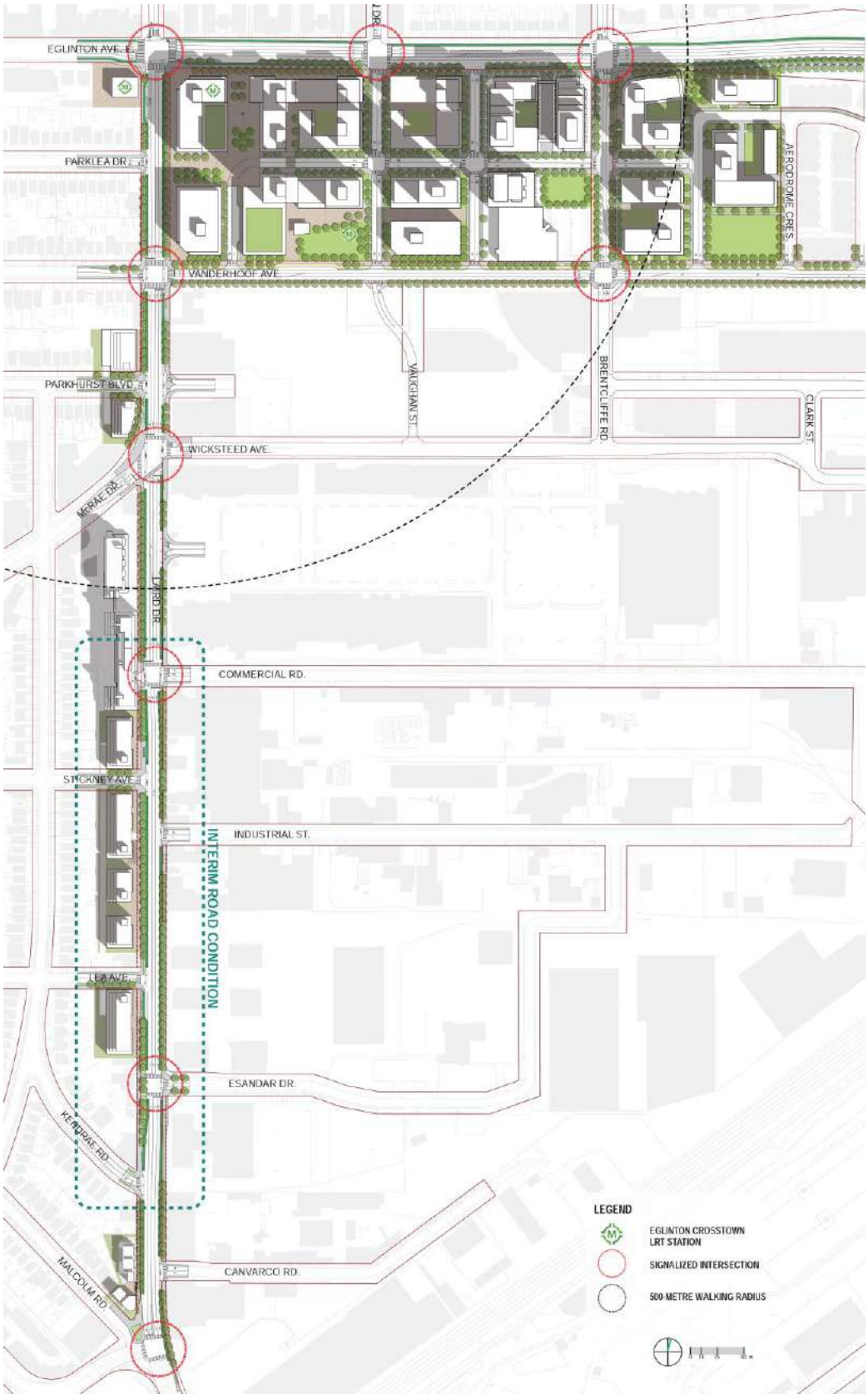
9.2.1 Roadway Descriptions

The following sub-sections provide an overview of the recommended typical sections for key roadways in the study area. To be read in conjunction with the functional concept plan and typical sections, these elements are addressed:

- roadway classification;
- right-of-way requirements;
- pedestrian and cycling facilities;
- bus transit interface provisions;
- boulevard and streetscape features;
- goods movement considerations; and,
- number and width of vehicular lanes, including identification of any intersection treatments, on-street parking provisions, and any non-standard treatments.

The typical sections have been used to confirm maximum right-of-way widths, and to inform of any necessary amendments to the Official Plan. The overall plan is provided in Figure 9-10.

Figure 9-10: Overall Roadway Plan



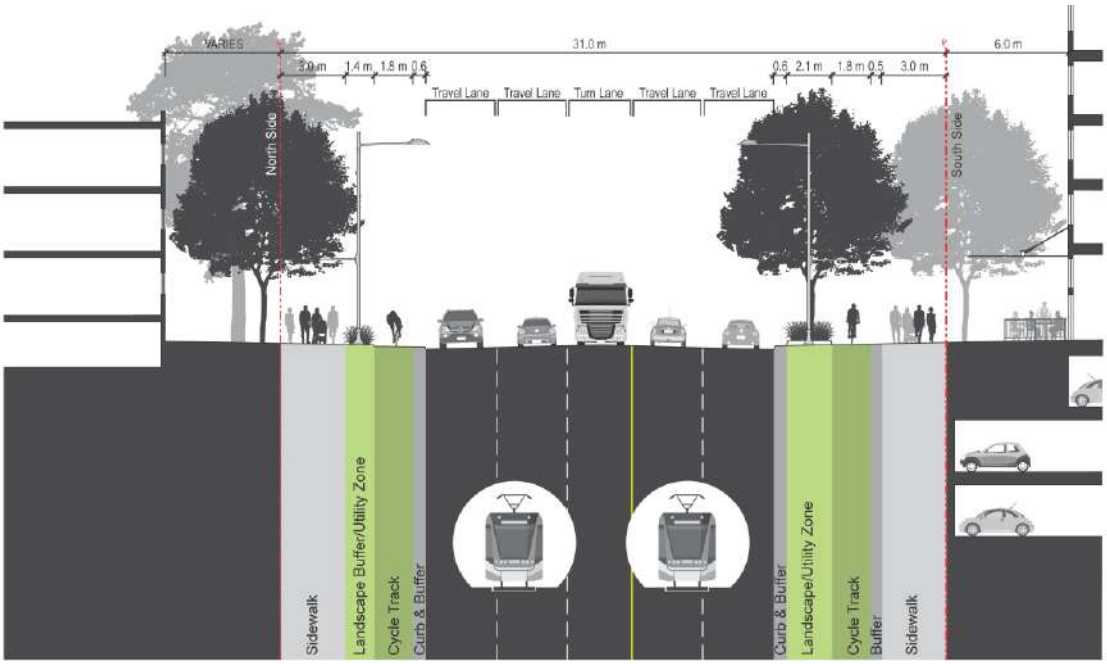
Eglinton Avenue

The recommendations from the EGLINTONconnects study are supported and endorsed for implementation. Recommended generous sidewalks in conjunction with building setbacks, cycle tracks buffered by landscaped zones and strategically placed bus lay-bys and on-street car parking, will provide an enhanced walking and cycling environment. This will support safe and comfortable access to the ECLRT to encourage non-vehicular trips, and to the planned mixed uses along Eglinton Avenue, with the anticipated greater range of and intensity of users than the other streets in the study area.

Although Eglinton Avenue will remain a major arterial with a high volume of vehicles and trucks, that will continue to provide regional connections as part of the larger transportation network, once the ECLRT is operational, a transformation in travel modes will occur, locally and regionally. A balanced and integrated multi-modal transportation network is critical for success to reduce the number of vehicular trips.

Figure 9-11 illustrates the proposed Eglinton Avenue cross-section in the vicinity of the study area.

Figure 9-11: Eglinton Avenue Typical Section



Laird Drive

Laird Drive is the primary north-south street in the study area that separates 2 distinct land uses in the Leaside community – the residential neighbourhood to the west and employment areas to the east. On the east side is a combination of recent low density mixed use / retail uses and older commercial properties. The west side presents a combination of older low density mixed use / retail uses and emerging new mid-rise residential developments. Heritage sites, including a few recently designated ones, are present along the west side of Laird Drive.

Although designated as a major arterial, Laird Drive presently provides a broad transportation role with respect to vehicular movement, which negatively impacts the pedestrian and cycling environments. Laird Drive provides direct driveway access and on-street parking, while also

being an important link in the local and regional road and goods movement network, a network that is challenged by a high degree of circuity. The ECLRT and supportive development presents an opportunity to evolve the transportation network and provide improved mobility.

It is envisioned that Laird Drive could provide an increasingly multi-modal function role as a central spine for the Leaside community that unifies the distinct land uses – residential to the west and the employment areas to the east – providing a safe and comfortable street for all ages and abilities.

Laird Drive can evolve into a destination for both communities, for workers and area residents both during and after typical business hours. Laird Drive can unify the existing distinct land uses with an enhanced landscaped streetscape. Combined with generous landscaped building setbacks this will promote the green streetscape character that can accommodate opportunities for grade-related plazas, patios and other public amenities. Laird Drive will become increasingly a local destination.

Laird Drive will also be the key connector for all modes to the ECLRT, to existing and planned community facilities, and to the regional transportation network and recreational resources.

To achieve this destination, unifying, and connector function, Laird Drive's transportation role needs to evolve into a balanced multi-modal transportation role to better serve the local community needs and to promote local non-auto trips within the area. Improved walking and cycling facilities, streetscape and amenities integrated with the local surface bus network, while maintaining an appropriate level of service for vehicular and goods movement requires a re-balancing of the planned 27.0m right-of-way (ROW) width.

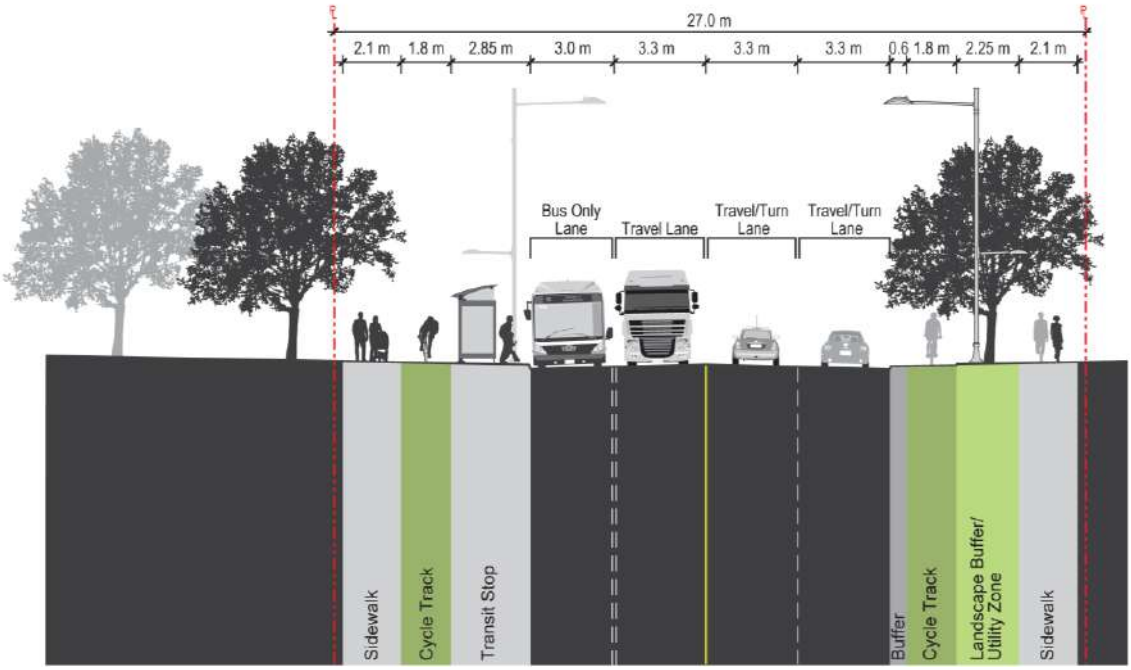
Figure 9-12: Laird Cycling Use

The following discussion describe for Laird Drive segments the recommended re-balancing of the proposed 27.0m ROW, including supporting rationale.

Segment 1 – Eglinton Avenue to McRae Drive: This segment is in the vicinity of the ECLRT's Laird Station entrances, the planned community facility, emerging retail uses, and a major east-west cycling facility. Significant pedestrian and cycling volumes, and numerous on-street surface bus connections are not only anticipated, but also desirable. To accommodate a

balanced multi-modal approach within a 27.0m ROW, but also recognizing that a 6m building setback will be provided on the east side, a recommended typical section has been developed, as illustrated in Figure 9-13.

Figure 9-13: Laird Drive Typical Section - South of Eglinton Avenue



South of Parklea Drive to McRae Drive the roadway curb-to-curb width increase to 13.2m (4 – 3.3m lanes). The intersection at Vanderhoof Avenue will be signalized to: provide a safe pedestrian and cycling crossing to access transit, the planned community centre, emerging retail uses, and the proposed east-west multi-use trail facility; and, to facilitate the anticipated increased turning movements. To be noted, the intersection south of Vanderhoof Avenue and Larid Drive will not permit East-West thru movement. At both Vanderhoof Avenue and McRae Drive intersections, lane functions (i.e. thru and / or turning) transition to prioritize anticipated key vehicular movements. Further, at proposed bus stop locations, the cycle track will ramp up to the platform elevation, and traverse the bus stop area on the roadside of the bus shelter.

Access into the proposed new development on the east side, across from Parkhurst Boulevard, will be designed to restrict movements to only right-ins and right-outs.

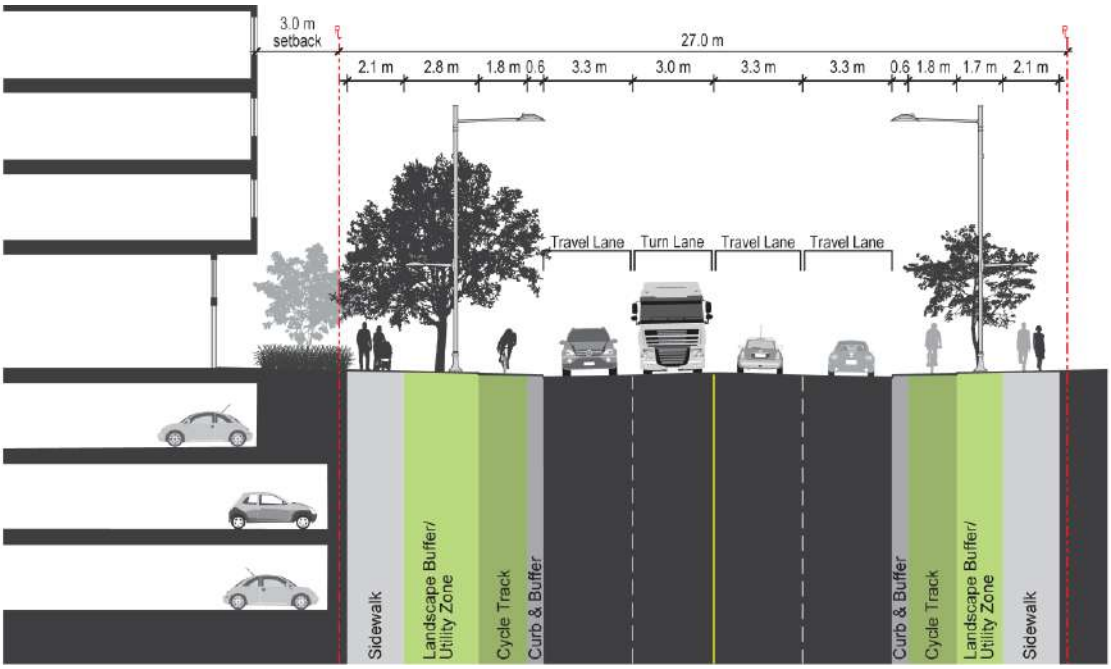
Segment 2 – McRae Drive to Commercial Road: In addition to improving the pedestrian / cycling / transit environments, this segment will need to address major driveways to planned developments on both sides of Laird Drive, and significant truck volumes as Commercial Road is the proposed designated truck route and access point into the Leaside Business Park.

Figure 9-14 illustrates the recommended typical section along Laird Drive between McRae Drive and Commercial Road.

It is recommended that the McRae Drive eastbound movement include a right turn restriction. Existing turning movements are very low and there are several alternative routes presented. Removal of the channelization island and replacing it with a minimum radius and turning restriction, will reclaim significant right-of-way to implement a gateway feature that could highlight Leaside's heritage and support cycling and walking amenities. But more importantly,

the reduced crossing lengths and increased storage areas enhances the safety for pedestrians and cyclists for all intersection crossing movements.

Figure 9-14: Laird Drive Typical Section - South of McRae Drive



Segment 3 – Commercial Road to Esandar Drive: During the progress of the study, heritage properties were identified including 96 Laird Avenue (northwest corner of Laird Drive / Lea Avenue), which encroaches into the proposed 27.0m right-of-way. To date, only the east side 3.5m has been conveyed, so presently there is a 23.5m ROW available.

Prior to the heritage property designations, a symmetrical cross-section was recommended as shown in Figure 9-15.

Ultimately, 4 – 3.3m vehicular lanes will be required beyond the designated heritage property, as illustrated in Figure 9-16. This will require a 27.0m right-of-way, which means that an additional 3.5m property conveyance is required when redevelopment occurs on the east side.

Figure 9-15: Typical Section at 96 Laird Drive (Pre-Heritage Designation)

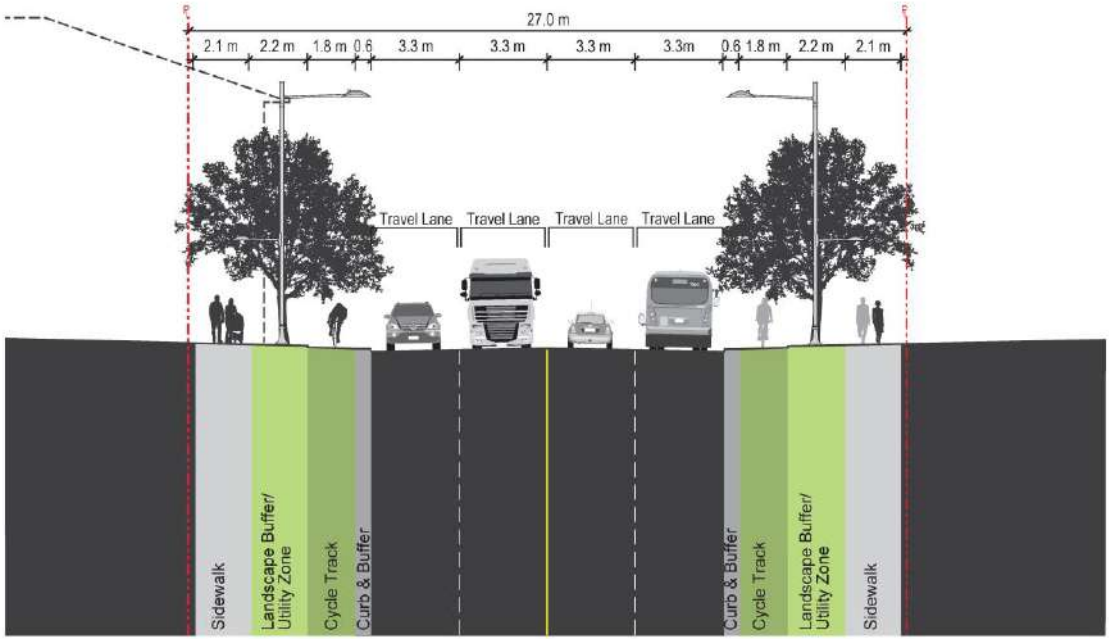
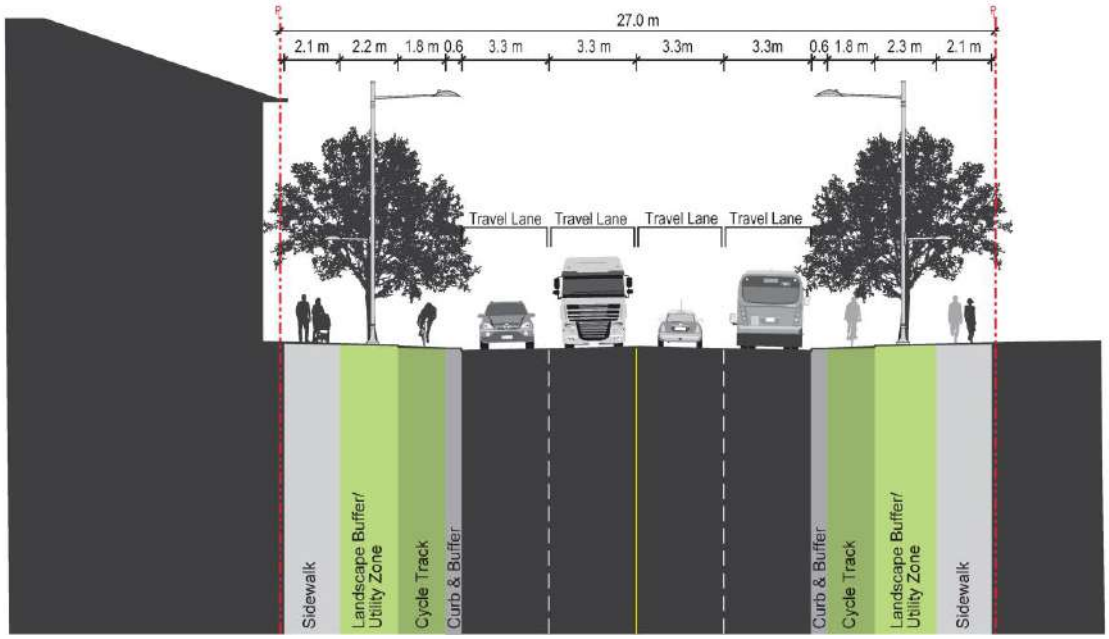


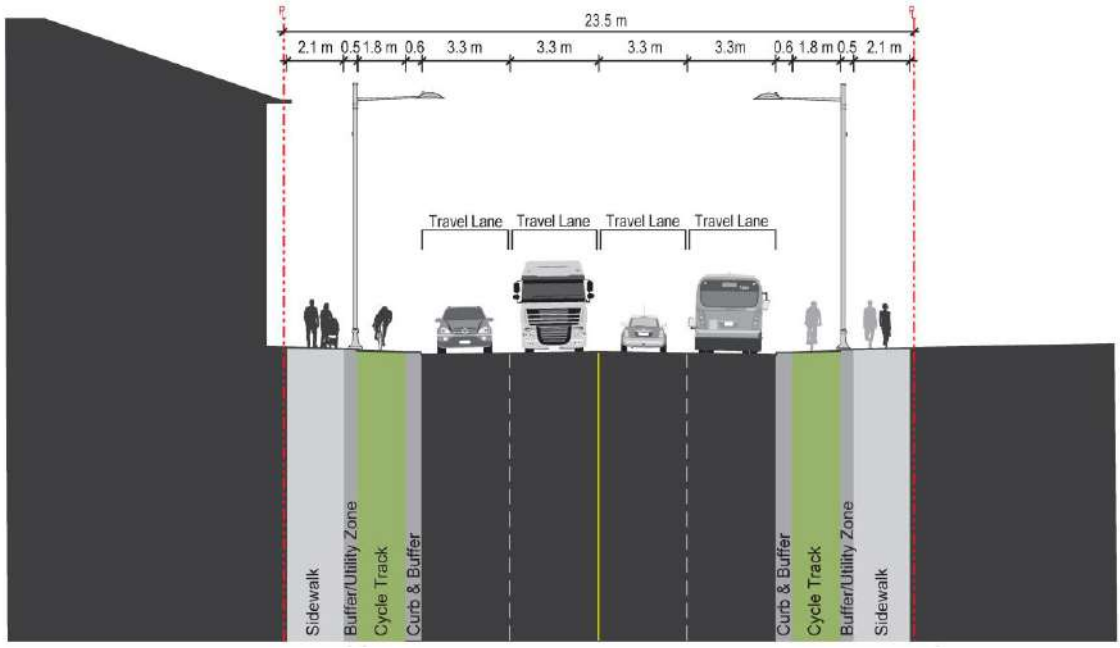
Figure 9-16: Typical Section at 96 Laird Drive (Ultimate Cross-Section)



To promote near-term cycle track construction along Laird Drive, 2 potential interim options were developed using the existing 23.5 right-of-way.

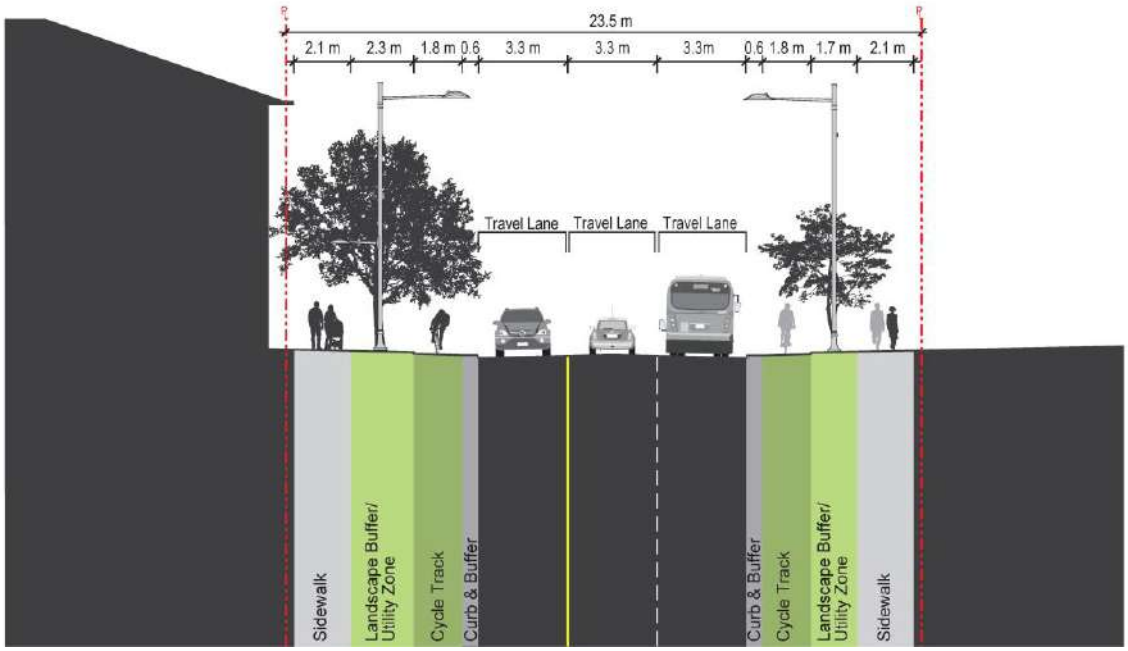
Interim Option 1 utilizes the existing 23.5m ROW and provides the ultimate 4-lane with cycle tracks cross-section. As a result, as shown in Figure 9-17, no green / landscaping zone is provided on either side. Further, a roadway shift of over 2m is required presenting a significant roadway transition on both the north and south approaches, which impacts all roadway elements.

Figure 9-17: Option 1 - Interim Typical Section at 96 Laird Drive



Interim Option 2 also initially utilizes the existing 23.5m ROW, but with only 3 traffic lanes – a 3.3m lane in the northbound and southbound direction, and a 3.3m continuous two-way left turn lane as shown in Figure 9-18. This configuration allows for landscaped boulevards on both sides. The resulting roadway shift is reduced. Both the roadway shift and the west side boulevard is constructed to the ultimate 4-lane cross-section configuration.

Figure 9-18: Option 2 - Interim Typical Section at 96 Laird Drive



When redevelopment occurs on the east side, including with an additional 3.5m property conveyance, the ultimate 4-lane cross-section can be constructed, with only the roadway's east side requiring widening and reconstruction. Interim Option 2 is subject to future public consultation.

Segment 4 – Esandar Drive to Millwood Road

This segment will ultimately be a 4-lane cross-section, two lanes in each direction. Although the designated ROW is 27.0m, additional property may be required: to facilitate an ultimate 4-lane transition at the Esandar Drive intersection; to provide a typical bus stop configuration; and, to ultimately extend the cycle track network across the CPR corridor.

The recommended Laird Drive 4-lane typical section from south of Esandar Drive to the reconstructed Millwood Road follows the typical cross section identified in Figure 9-16:

Vanderhoof Avenue

Transforming Vanderhoof Avenue to become a beautiful greenway linking existing Leaside neighbourhoods and planned developments to shared public uses and the Don Valley ravine system was one of the identified "10 Big Moves" of the Laird in Focus study.

The intent is to provide an asymmetrical cross-section within the existing 20.0m right-of-way, providing a wider boulevard width on the north side. As a result, an increased buffer distance with the remaining employment lands to the south will be provided. This wider boulevard also provides for a lay-by facility to be used for TTC buses, and as a pick-up / drop-off (PUDO) zone for the planned community facility and associated parklands.

Figure 9-19 and Figure 9-20 illustrate the recommended typical section proposed for Vanderhoof Avenue.

The intersection of Vanderhoof Avenue and Laird Drive will be signalized. The design will be focussed on providing safe pedestrian and cycling access for the local communities. Vehicular through movements along Vanderhoof Avenue will be restricted to minimize vehicular traffic on local streets.

Figure 9-19: Vanderhoof Avenue Typical Section

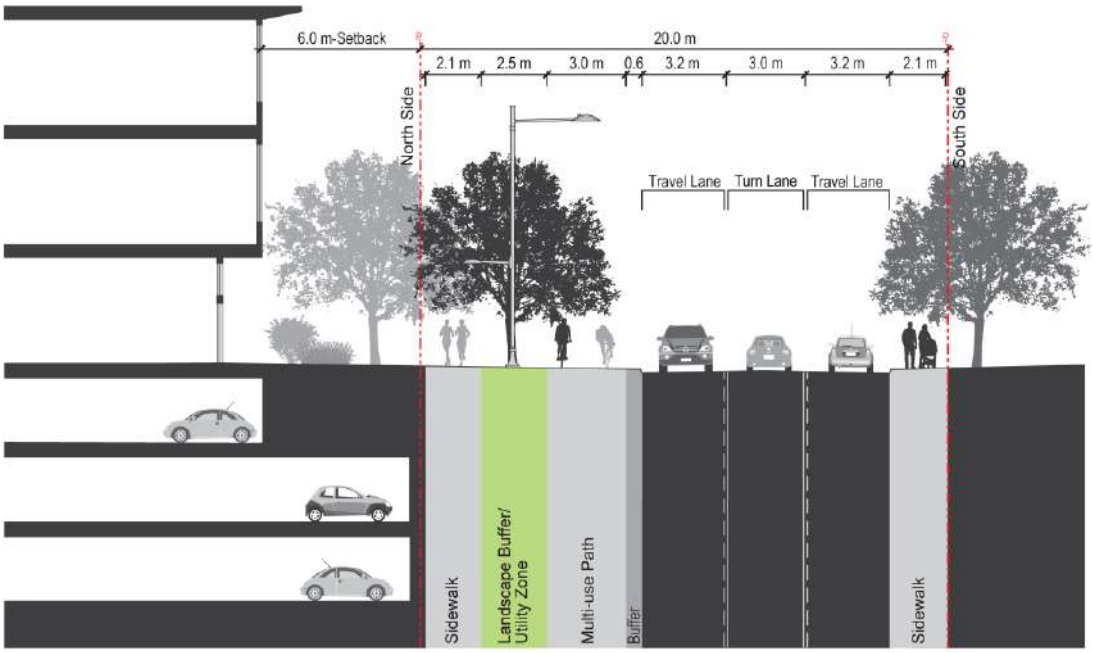
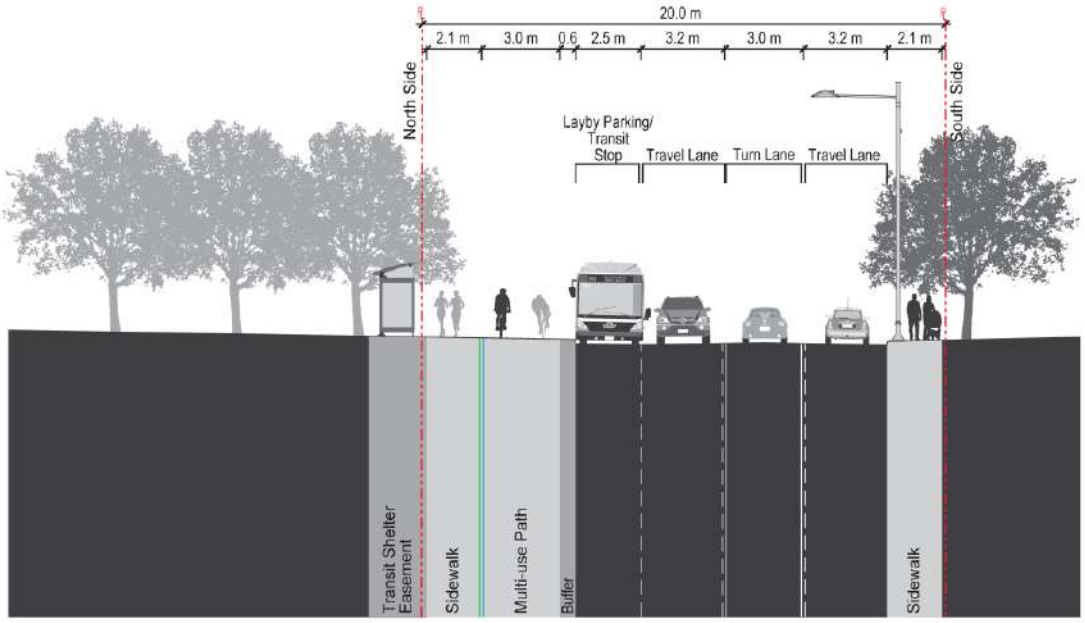


Figure 9-20: Vanderhoof Avenue Typical Section with Layby Adjacent to Public Park



To be noted, in order to maintain a consistent cross-section with the multi-use trail on the north side, the travelled roadway of Vanderhoof Avenue will have to be shifted to the south east of Aerodrome Crescent and in the vicinity of Leonard Linton Park.

New Local Streets

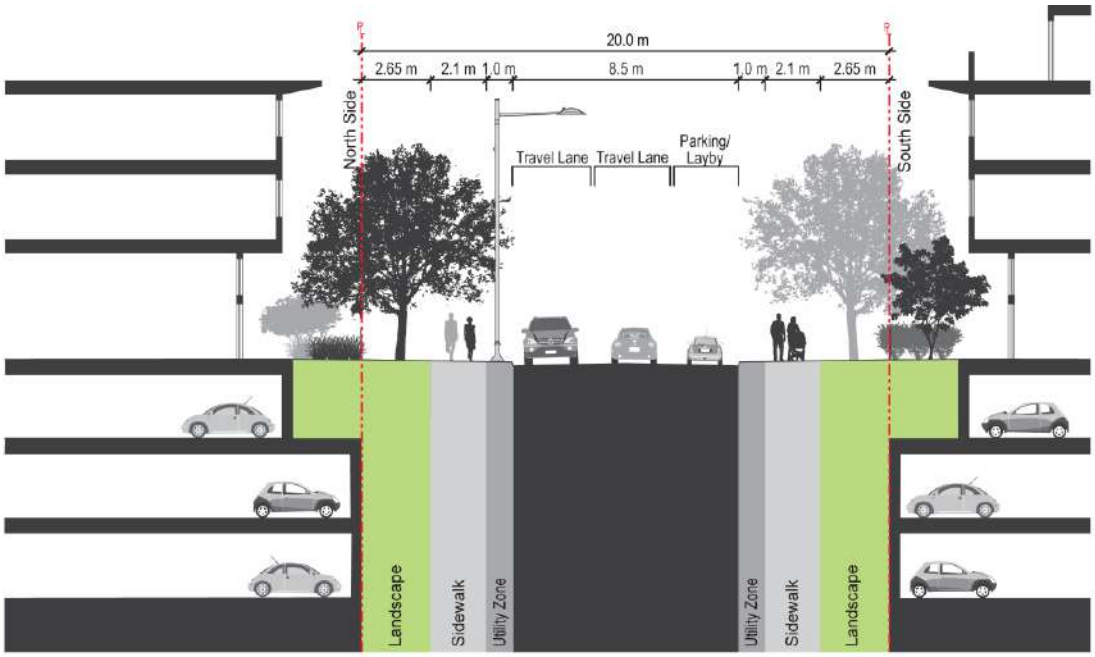
A new east-west local street is proposed between Eglinton Avenue and Vanderhoof Avenue linking key destinations include the transit station, the existing and planned community facilities, parks, and emerging retail and office uses. The new local street was not extended to Laird Drive to minimize impact to bus and vehicle movements south of Eglinton Avenue close to the LRT station.

New north-south local streets are proposed between Laird Drive and Brentcliffe Road, the extension of Don Avon Drive and Street 'B'. These streets between Eglinton Avenue and Vanderhoof Avenue are critical to implementing a finer grain street network that will provide alternative routing choices.

As part of the redesign of the Don Avon Drive and Eglinton Avenue intersection, which will be signalized, vehicular through movements will be restricted to minimize vehicular traffic on local streets. The intersection design will focus on providing safe pedestrian and cycling access for the local community.

These streets will be classified as local streets with a 20m right-of-way. With an attractive public realm treatment, the new street will be pedestrian-friendly with a focus on intimate passive activities in comparison with a busier and active Eglinton Avenue. Figure 9-21 illustrates the typical cross section of a local street.

Figure 9-21: Street 'A' (Mid-Block) Typical Section



Brentcliffe Road

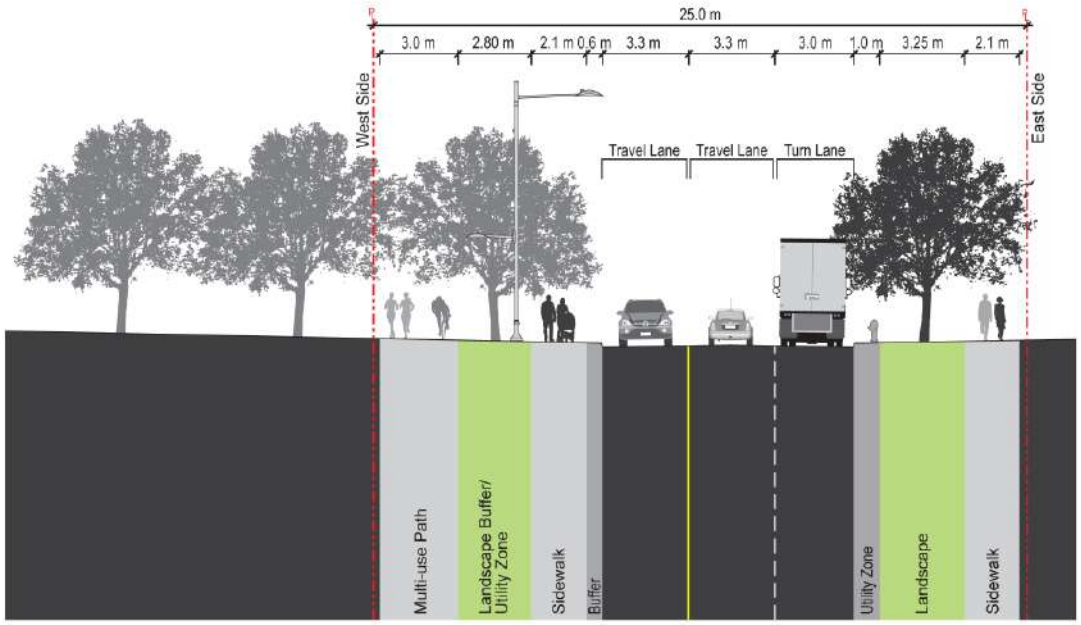
Brentcliffe Road between Eglinton Avenue and Wicksteed Avenue is a minor arterial that will continue to, provide a significant transportation role with respect to vehicular, transit, and goods movement. This is a major consideration in the re-balancing of transportation elements within the planned 25.0m right-of-way. Figure 9-22 illustrates the proposed re-balancing within the ROW.

It is envisioned that Brentcliffe Road will remain as a key goods movement route, in and out of the Leaside Business Park. Providing a long northbound right turn lane at Eglinton Avenue, uninterrupted with a mid-block stop, including a larger turning radius, will continue to support goods movement activities.

Generous 2.1m sidewalks are provided on both sides buffered by a wide landscaping zone on the roadway side with a minimum 3.0m width that will significantly enhance the pedestrian environment for all ages and abilities. A 3.0m multi-use trail on the west side will connect to the proposed multi-use trail along Vanderhoof Avenue and terminate at Street ‘A’ in the vicinity of a proposed park facility.

A two-bus bay along Brentcliffe Road in the southbound direction, south of Eglinton Avenue, is also proposed for timed layovers for potential multiple routes.

Figure 9-22: Brentcliffe Road Typical Section



9.2.2 Intersection Treatments

Different techniques are recommended to promote a safe pedestrian and cycling environment, and to discourage non-local traffic entering the adjacent residential neighbourhoods. The major proposed initiative is to locally narrow the roadway width, reduce the intersection turning radii, and to introduce an elevation raise, preferably with visual cues (i.e. texture and colour treatments).

Figure 9-23: Intersection Treatment Options

These treatments will reduce speeds and thereby lengthen travel times, and will significantly discourage larger vehicles / trucks from entering. As a result of these initiatives, safety is promoted, including pedestrian and cycling crossing times are shorten. These treatments are recommended along local roads only along Laird Drive intersections (Parklea Drive, Vanderhoof Avenue, Parkhurst Boulevard, Stickley Avenue, Lea Avenue, Kenrae Avenue) and at the Eglinton Avenue and Don Avon Drive intersection.

9.2.3 Right-of-Way Requirements

As previously described, the recommended mobility plan is generally within the roadway's designated right-of-way, with the following potential exceptions;

- additional property near the proposed heritage designated property at 96 Laird Drive in order to provide a consistent and continuous streetscape along Laird Drive, and / or to protect for an ultimate 4-lane cross-section along Laird Drive;
- localized property beyond the designated right-of-way widths at key intersections to site bus stops with desirable shelters / amenities and cycling facility interface.

9.2.4 Overall Pavement Markings and Signage for Traffic Control Devices

The following non-standard and site-specific pavement markings / traffic control devices are recommended:

- wider crosswalks (i.e. 6m) along key pedestrian movement routes and where high volumes are anticipated;
- no thru traffic signage to be provided at the intersections of Don Avon Drive and Eglinton Avenue and Vanderhoof Aveneue and Laird Drive;
- no right turn signage in the eastbound directions at the McRae Drive and Laird Drive intersection.

An intermediate signalized crossing location along Laird Drive between Commercial Road and Esandar Drive should also be explored, considering where the TTC plans to place a bus stop along this section.

9.3 Implementation Plan

An implementation plan for the recommended mobility plan has been developed defining infrastructure, policy, and service improvement requirements. The following section outlines the requirements for:

- Development Phasing;
- Policy Directions;
- Environmental Assessment (EA) Requirements;
- Development Charges; and,
- Monitoring and Assessment Plan.

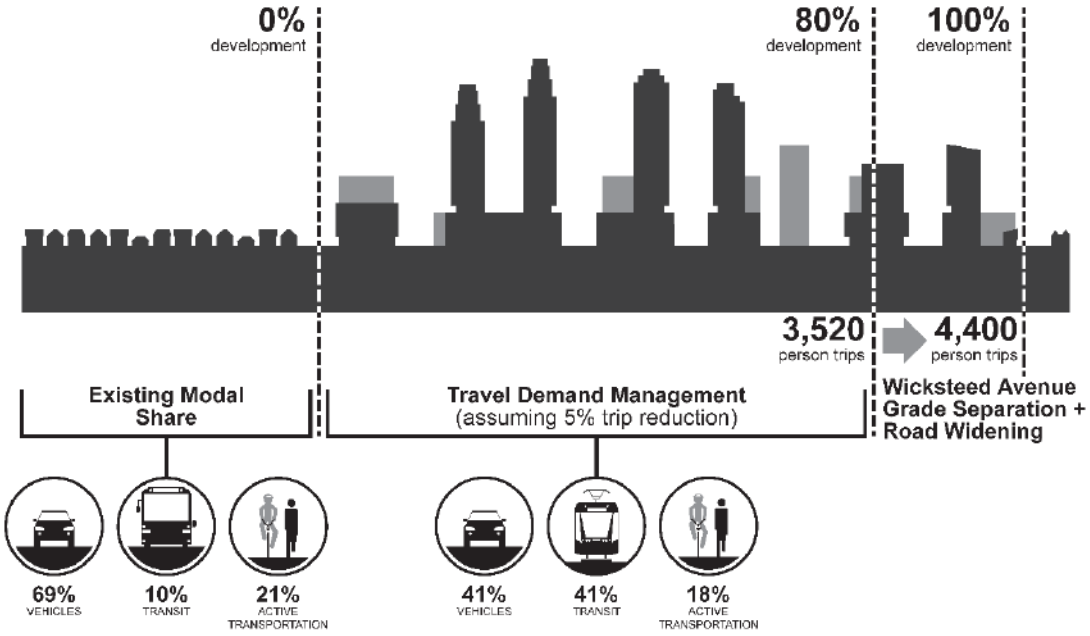
9.3.1 Development Phasing

The recommended mobility plan findings present an implementation plan based upon development levels and the need for additional infrastructure (to be noted assumes ECLRT operational). An additional critical roadway improvement is envisioned in order to add capacity to the network. A potential option is a Wicksteed Avenue roadway widening from Brentcliffe Road to Millwood Road via Beth Nelson Drive, including a CPR grade separation. This improvement will provide additional east-west roadway capacity, including increased connectivity and access to and from the employment lands.

Also noted, was that an achievable 10% TDM-related trip reduction rate with an associated 10% increase in the transit mode split, would provide a sufficient reduction in demand to accommodate the proposed development. To achieve the planned development levels, two scenarios are presented:

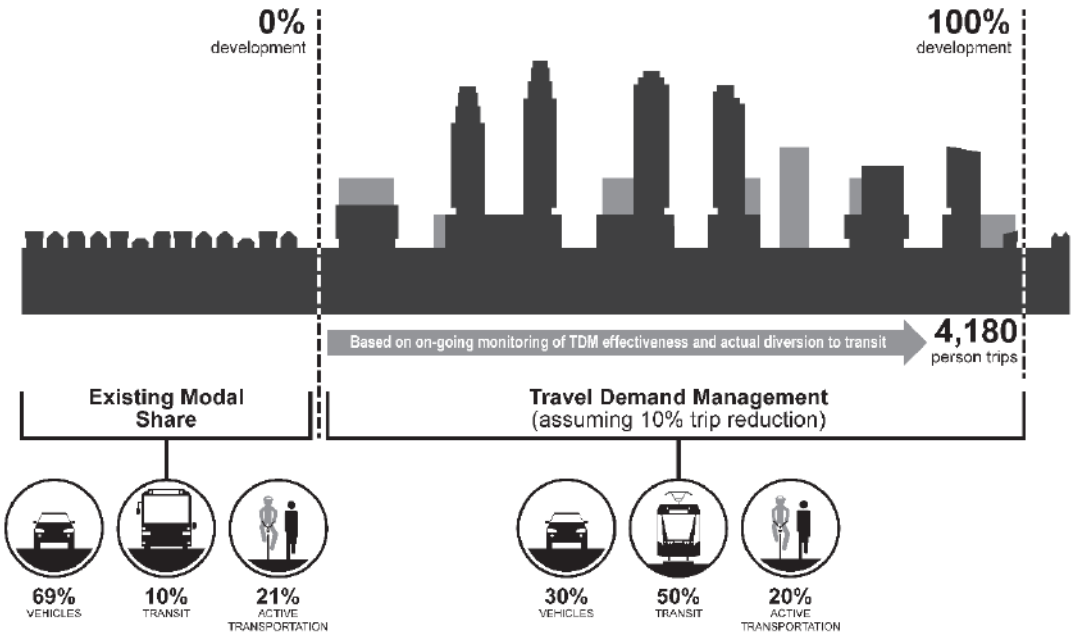
Option 1: Adopting a modest 5% TDM-related trip reduction, but including additional roadway infrastructure, such as a Wicksteed Avenue road widening and grade separation, at approximately the 80% development build-out phase.

Figure 9-24: Option 1 Key Benchmarks



Option 2: Successfully embracing TDM strategies to achieve a 10%-person trip reduction and an additional 10% person trip diversion to transit. Monitoring of the transportation network, pre-development and during development as it comes into service, is critical.

Figure 9-25: Option 2 Key Benchmarks



9.3.2 Policy Directions

Identified policy directions to implement the recommended mobility plan include:

- Official Plan Amendments – to secure all new public streets in Schedule 1 and 2 of the Official Plan;
- Cycling Network Amendment – to refine the Cycling Network Plan; and,
- Zoning By-Law 569-2013 amendment to include Policy Area 2 designations for developments within 500m of a transit station, and a Policy Area 3 designation elsewhere. Further site-specific parking space rate reductions should be considered when accompanied with additional TDM and innovative mobility measures that will contribute to additional person trip reduction.

9.3.3 Environmental Assessment (EA) Requirements

Based on the recommended mobility plan, potential EAs that need to be undertaken have been based on the recommended mobility plan, potential EAs to be undertaken have been identified:

- Road capacity improvements such as Wicksteed Avenue road widening and CPR grade separation; and,
- Laird Drive reconstruction, dependent on scope and capital costs, could include the addition of cycle tracks, roadway reconfiguration, municipal servicing and other utilities, and the extension of the proposed Laird cycle tracks across the CPR corridor to Millwood Road.

9.3.4 Development Charges

The City conducts development charges studies to identify funds to be collected for transportation infrastructure improvements under the Development Charges (DC) Act and associated DC By-Laws. These studies typically identify all types of transportation infrastructure required to serve development growth, including roads, transit, and active transportation. The City should consider amending their DC By-Law to include associated infrastructure for emerging TDM (i.e. ride-share, car-share and trip planning programs) and sustainable technologies (i.e. electric vehicle charging points).

9.3.5 TDM Monitoring and Assessment Plan

A multi-modal demand model generated trips for the area was developed considering each mode, each development block, each existing and planned land use and characteristics, provided mobility choice and quality (i.e. vehicle, transit, cycling and pedestrian networks), and existing mode splits, volumes and travel patterns. Given the area's presently limited existence of ride-sharing and other typical TDM measures and existing low-density residential characteristics, a modest trip reduction of 5% was adopted.

Given that a relatively modest TDM-related trip reduction rate was adopted, potential for a higher rate is considered highly feasible with innovative technologies, evolving societal behaviour, and emerging programs supported by developing policies. As such, a higher trip reduction rate of 10% rate was tested, which is presently achieved in other parts of the City. Based on these tests, a 10% reduction to peak hour total person trips, and an additional increase in transit mode share of 10%, would allow for the planned development to be built in full, and be supportable by existing infrastructure.

As such, developers will be required to submit a comprehensive TDM plan and contribute to a TDM monitoring program.

Appendix C

City of Toronto

Laird Focus Study

Functional Servicing Report

June 2018

Submitted by:

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Project Number: 1896

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1.0 INTRODUCTION

SCS Consulting Group Ltd. has been retained by the Planning Partnership to prepare a servicing analysis as part of the Laird Focus Area Study, in support of future densification within the areas described below.

1.1 Purpose of the Report

This study is an assessment of the adequacy of the existing Toronto Water infrastructure with respect to the capacity of watermains, sanitary, storm and combined sewers within the study area. It will provide a description of each component of the existing infrastructure, the information reviewed, methodology, key assumptions, constraints identified and summary recommendations for improvements to properly support long term growth.

Having reported on the existing conditions of the Study Areas' infrastructure and based on the assessment of massing of the preferred alternative, this Phase 3 report outlines the servicing strategy for long-term growth within the Lair Focus Area Study.

Anticipated contributions to the municipal infrastructure from the proposed densification (preferred alternative) was modeled into the various systems reviewed to determine infrastructure recommendations to support future development.

A recent push for development in the area has resulted in the need to study local infrastructure for future intensification planning.

1.2 Study Area

The study area can generally be described as the west side of Lair Drive from Vanderhoof Avenue to Southvale Drive and the employment lands north of Vanderhoof Avenue from Laird Drive to Aerodrome Crescent. Please refer to **Figure 6.1** found in **Appendix C-1**

1.3 Objectives

This study is an assessment of the impact of densification on the existing Toronto Water infrastructure with respect to the capacity of watermains, sanitary, storm and combined sewers within the study area. It provides a description of each component of the existing infrastructure, the information reviewed, methodology, key assumptions, constraints identified and summary recommendations for improvements to properly support long term growth.

Specifically, the goals and objectives of the Phase 3 report is to:

- Build on the existing identified conditions and assess the future impacts of the proposed densification on Toronto Water infrastructure;
- Provide recommendations on infrastructure improvements to address previously identifies deficiencies; and,
- Provide recommendations on infrastructure improvements necessary to implement growth plan.

1.4 Preferred Alternative

The Focus Study includes two separate areas each representing different built-forms of densification. Area 'A', located along Eglinton Avenue East is roughly 9.7 hectares and is expected to yield a total unit count of 3,765 or an equivalent population count of 8,335 when factoring employment. Area 'B', located on the west side of Laird Drive is roughly 3.8 hectares and is expected to yield a total unit count of 815 or an equivalent population count of 1,975 when factoring employment. Please refer to the summary yields found in the planning study **Section 5.3 and 5.4** respectively, and **Appendix A.**

1.5 Applicable Standards, Design Criteria and Documents Reviewed

The following applicable standards, design criteria and public documents were considered and reviewed in the preparation of this Phase 3 report:

- Design Criteria for Sewers and Watermains, City of Toronto, November 2009.
- Wet Weather Flow Management Guidelines, City of Toronto, November 2006.
- Toronto Municipal Code, §681 Sewers, May 2016.
- Procedure F-5-5 of Guideline F-5: levels of treatment for municipal and private sewage treatment works discharging to surface waters, Ontario Water Resources Act, RSO 1990, Section 53.
- Building Code Act 1992
- Development applications as noted in Section 2.2.7 Recent Development Applications of the RFP.
- Sewer Atlas Maps (for information purposes only), City of Toronto, September 2010.
- Report on Municipal Services in the Leaside Area, Borough of East York, October 1973.
- 2017 Capital Works Program, City of Toronto.
- City of Toronto digital water model.
- City of Toronto digital sewer model
- Basement Flooding Study, Area 2, XCG Consultants Ltd., November 2014.
- Metrolinx Laird Station plans

2.0 PHASE 1 REPORT SUMMARY

In order to put the contents of this report into the proper context, we offer below a brief summary of the objectives and recommendations of the Phase 1 report.

2.1 Phase 1 Goals and Objectives

The Phase 1 report was an assessment of the existing Toronto Water infrastructure with respect to the capacity of watermains, sanitary, storm and combined sewers within the study area shown on **Figure 6.1**. It provided a description of each component of the existing infrastructure, the information reviewed, methodology, key assumptions, constraints identified and summary recommendations for improvements to properly support long term growth.

Specifically, the goals and objectives of the Phase 1 report were to:

a) Document existing conditions;
b) Provide an opinion as to the adequacy of the existing infrastructure to service future development; and,
c) Provide recommendations on immediate measures that can be taken to better document existing conditions and to address any identified infrastructure deficiencies.

2.2 Phase 1 Conclusions

Based on our review of the existing information, meetings with the City of Toronto staff, our field program and observations, the Phase 1 report concluded the following:

- Future densification along the Eglinton Avenue East frontage will require more in-depth study of the downstream impacts and will require municipal sanitary upgrades. Water demands and fire protection requirements will be studied in greater depths once the massing plan is finalized.
- Densification along Laird Drive is feasible based on dry-weather flow impacts only. As future development along this stretch of road is serviced by combined sewers, a 'net reduction' in combined flows (sanitary effluent + storm run-off) will be required for all storm events in order to improve downstream conditions.
- It is recommended to explore the feasibility of constructing new fully separated storm sewers through the study area and within the upstream catchment area to alleviate surcharging conditions.
- It is likely that watermain upgrades may be required in order to intensify the area, but this will be determined once intensification nodes have been determined.

3.0 EXISTING INFRASTRUCTURE

The following information is a summary of the existing infrastructure within the study area boundary depicted in **Figure 6.1** included in **Appendix C-1**.

3.1 Sanitary Sewer

There are few dedicated sanitary sewers located within the study area. Generally, these consist of 250-300 mm diameter sanitary pipes located on Vanderhoof Ave., Brentcliffe Rd., Aerodromme Cr. and on the south boulevard of Eglinton Ave. W. These sewers drain eastwards to the Metrolinx in-line storage pipe and ultimately discharges to the Don River West Branch trunk sewer.

There are no other sanitary sewers within the study area. There are some local sanitary sewers located east of the study area, within the industrial lands draining to the study area combined sewers, however these sewers were not studied as part of this report.

3.2 Storm Sewers

There are few storm sewers located within the study area. Generally, they consist of local sewers up to 1,200 mm diameter pipes located on Vanderhoof Ave., Brentcliffe Rd., Aerodromme Cr. These sewers outlet to a 1,200 diameter sewer outside of the study area and ultimately discharges into the Don River West tributary.

There are no other storm sewers within the study area. There are some local storm sewers located east of the study area, within the industrial lands draining to the study area combined sewers, however these sewers were not studied as part of this report.

According to the November 5, 2014 Basement Flooding Study, Figures 6.6 and 6.8, the depth of water in the overland flow system for the 5-year and 100-year storm respectively are reported to be between 0 – 150 mm in depth and thus was not flagged as problematic in the report.

3.3 Combined Sewers

The study area is mostly serviced by combined sewers ranging in size from 300 mm diameter sewers to 1,200 mm diameter sewer. Laird Drive has a dual combined sewer system. The east side mostly consists of small diameter local sewers, servicing the east side of Laird Drive which typically outlets the large diameter combined sewer located on the west side of Laird Drive. The west portion of Laird Drive consists of large diameter sewers serving both a local and trunk function.

There is one Combined Sewer Overflow (CSO) location along the downstream reach of sewers on Laird Drive, at Wicksteed Avenue. At this location, surcharging within the combined sewer is relieved by overflowing to a 975 mm storm sewer running eastward along Wicksteed to the Don River (just south of Eglinton Avenue).

Please refer to **Figure 6.2** found in **Appendix C-1** for a general layout of the sewer infrastructure located within the study area.

3.4 Watermains

The study area forms part of Pressure District 3E generally bounded by Bayview Avenue to the West, Kilgour Road to the north and the Don Valley Parkway to the east and south. Generally, the pressure district is fed from a 600mm diameter watermain along Don Mills Avenue via a 400 mm diameter main along Overlea Boulevard.

Water within the study area, and the larger pressure district, is locally supplied by small-diameter watermains, ranging in size from 150 mm to 400 mm. The infrastructure material vary throughout the pressure district, but typically consist of ductile iron and PVC pipes.

Study area 'A' bound by Vanderhoof Avenue and Eglinton Avenue East is generally serviced by local watermains ranging in size from 150 mm to 300 mm. These provide water services to development flanking Vanderhoof Avenue, Eglinton Avenue East, Brentcliffe Road and Aerodrome Crescent.

There are two watermain on Laird Drive (Study Area 'B'), a 400 mm diameter main feeding the pressure district from Don Mills Avenue, across Overlea Boulevard to Parkhurst Boulevard and 250 mm to 300 mm diameters local watermain providing water services to development flanking Laird Drive.

Please refer to **Figure 6.3** found in **Appendix C-1** for a general layout of the water infrastructure located within the study area.

4.0 IMPLEMENTATION

Each applicant will be responsible to clearly document how the proposed servicing strategy of the applicant will satisfy the Toronto Wet Weather Flow Management Guidelines.

In addition, each applicant will be responsible for the preparation of a detailed servicing report that must demonstrate to which sanitary/combined sewers the proposed flows will be directed to and demonstrate consistency with the contents of this report. Additional modeling work may be necessary to assess the impact of each individual application once exact population counts are established.

It is recommended that the City continue to follow its standard practice of requiring hydrant flow tests to support individual development applications. The results from these tests should be used by the City to confirm that the performance of the system when tested is consistent with the basis upon which this study was prepared, and also to confirm the suitability of the system to support the application.

Furthermore, proponents will be responsible for the preparation and submission of all technical documents related to applying for (if necessary) a Private Water Discharge Approval and obtaining approvals from Toronto Water.

4.1 Storm Sewer and Stormwater Management

4.1.1 Existing Drainage

The existing site consists of mostly hard surfaces, either roof or pavement. As shown on **Figure 6.4** found in **Appendix C-1**, Area A conveys runoff to Eglinton Ave while Area B conveys it to Liard Drive. It has been assumed that Area A may have some on-site controls, but is not currently in compliance with the TWWFMG. In addition it is expected that no controls are provided within Area B. As noted previously, runoff from Area A is conveyed east while runoff from Area B is ultimately conveyed to the south.

According to the November 5, 2014 Basement Flooding Study, Figures 6.5 and 6.7, surface flooding was identified during the 5-year storm event and the 100-year storm event along Eglinton Avenue between Laird Drive and Brentcliffe Road. This is schematically represented on Figure 6.7 in Appendix C-1.

4.1.2 Proposed Drainage

It is anticipated that both study areas will continue to convey runoff to the existing outlets upon redevelopment as illustrated on **Figure 6.5** found in **Appendix C-1.** Each applicant will need to demonstrate how existing drainage patterns are to be maintained.

4.1.3 Design Criteria

Based on the TWWFMG, the design criteria for the study areas are as follows:

Quantity Control

The release rate to the municipal storm infrastructure will be limited to the allowable discharge rate to be determined as the lesser of:

- The existing peak flow rate from a 2 year storm event (with a maximum runoff coefficient of 0.50); and
- The existing capacity of the receiving sewer.

It must be demonstrated that the existing downstream system has capacity to convey the proposed peak flow rates up to the 100 year design storm event to an existing outfall, or provide on-site detention to control the 100 year peak flow rate to the municipal system to the allowable discharge rate.

As noted in this report Area B outlets to a combined sewer, therefore a reduction of existing flows from any one development with respect to stormwater and sanitary combined will need to be less than existing so as to not adversely affect upstream and downstream conditions within the City's infrastructure.

Quality Control

- Provide an Enhanced (Level 1) quality control per Ministry of the Environment guidelines (i.e., 80% TSS removal).

Water Balance

- The 1991 precipitation data from the Pearson International Airport rainfall gauge is to be used for the analysis;
- Stormwater is to be retained on-site (to the extent practical) to achieve the same level of annual volume of overland runoff allowable from the development site under existing conditions;
- The maximum allowable annual runoff volume leaving a proposed development is 50% of the total average annual rainfall depth; and
- The minimum on-site runoff retention requires the proponent to retain all runoff from a small design rainfall event - typically 5 mm (on average, the total rainfall from all small events with daily rainfall amounts, less than or equal to 5 mm, is equivalent to about 50% volume of the total average annual rainfall in Toronto) through infiltration, evapotranspiration and rainwater re-use.

Erosion Control

- No erosion control is necessary, as the study area does not discharge directly to or within 100 m of a natural watercourse, and provided that the on-site retention of the 5 mm rainfall event will be achieved under the Water Balance Criteria.

4.1.4 Expected Release Rate

In accordance with the TWWFMG, the allowable release rate to the existing municipal infrastructure was assumed to be the 2 year runoff rate under existing conditions with a maximum runoff coefficient of 0.5. It is noted that future applications will be required to assess any downstream constraints to confirm the allowable release rate.

The rational method was used to determine the target release rate from the study areas based on Intensity-Duration-Frequency (IDF) rainfall curves from the City of Toronto Design Standards.

The 2 year runoff rate under existing conditions to the existing storm sewer infrastructure for Area A is approximately 2,225 L/s. The 2 year runoff rate under existing conditions with a runoff coefficient of 0.50 as per TWWFMG is approximately 1,236 L/s. Therefore, the total expected release rate from all developments within this area to the existing City of Toronto infrastructure is approximately 1,200 L/s, a reduction of nearly 1000 L/s in the 2 year storm event alone.

The 2 year runoff rate under existing conditions to the existing storm sewer infrastructure for Area B is approximately 858 L/s. The 2 year runoff rate under existing conditions with a runoff coefficient of 0.50 as per TWWFMG is approximately 477 L/s. Therefore, the total expected release rate from all developments within this area to the existing City of Toronto infrastructure is approximately 477 L/s, a reduction of 44% in the 2 year storm event.

4.1.5 Quantity Control

Quantity control can be achieved through a combination of above and below ground storage located within each individual site plan block. As a method of guidance, a cubic metre of storage per hectare was developed based on the allowable release rates and a proposed runoff coefficient of 0.9. A storage volume of approximately 300 cu.m/ha is required to provide adequate 100 year control for both study areas. As noted previously, the required quantity controls will assist to alleviate existing strain on the stormwater infrastructure.

4.1.6 Quality Control

To achieve the required MOECC Enhanced Level quality treatment, a variety of practices will be required to form a treatment train, focusing on above and below grade infiltration or filtration based LID's (permeable pavement, bioswales, rain gardens, green roofs, etc.) or end of pipe treatment (oil/grit separator (OGS), etc.) to provide 80% TSS removal.

4.1.7 Water Balance

Runoff from a 5 mm rainfall event will be required to be retained on each individual site plan. It will be up to the applicant to determine an appropriate method by which to reuse this rainfall volume

4.2 Watermains

The preferred development provided by the consulting team was used in the assessment of servicing requirements and opportunities. The Study Area focuses on two distinct development areas consisting of:

- Area "A" consists of three major blocks fronting on Eglinton Avenue East which generally includes high-density mixed-use developments. The flow generation design criteria used for this area is 191 L/c/D for residential units and 180,000 L/Ha/D for ICI development.
- Area "B" consists of seven smaller blocks along the west side of Laird Drive which generally includes medium density mixed use developments. The flow generation design criteria used for this area is 320 L/c/D for residential units and 180,000 L/Ha/D for ICI development

Based on the above, preliminary water demand calculations for the two areas were prepared and are summarized in **Table 1** below:

Table 1 Summary of Proposed Development Water Demands

Study Area	ICI Area (m^2)	Residential Units	Residential Population	Avg Day Demands		Max Day Demands		Peak Hour Demands	
				ICI (L/s)	RES (L/s)	ICI (L/s)	RES (L/s)	ICI (L/s)	RES (L/s)
Area "A"	44,670	3,771	7,372	9.31	14.78	10.24	19.21	11.17	36.94
Area "B"	21,090	1,017	2,094	4.39	7.78	4.83	12.84	5.27	19.30

The model was updated to reflect the preliminary development conditions. The existing meter-based demands for the proposed redevelopment addresses were removed from the appropriate nodes and the preliminary future design demands were assigned to new nodes. The model was thus modified to revise average day, Max day and Peak hour demand scenario for the preferred alternative conditions. Post Development conditions. The preliminary post development conditions were simulated with the modified calibrated model to establish the residual pressures under several demand scenarios throughout the Study Area. The model was simulated for the following scenarios and the pressure / head loss in system was evaluated to understand the impact of the preliminary development on the existing system capacity. The model output for the post development condition analysis is summarized in **Table 2**:

Table 2 Post Development Condition Modelling Scenario Results

Water Demand Modeling Scenario	Minimum Water System Requirements	Modelling Results
Average Day Demand	Recommended System Pressures = 40 psi to 100 psi	Model System Pressure = 43.4 psi to 93.1 psi (Ref Fig 8)
Maximum Day Demand	Recommended System Pressures = 40 psi to 100 psi	Model System Pressure = 30.6 psi to 87 psi (Ref Fig 9)
Peak Hour Demand	Recommended System Pressures = 40 psi to 100 psi	Model System Pressure = 19.4 psi to 81.8 psi (Ref Fig 10)
Required Fire Flow to be provided at a residual pressure of no less than 20 psi		
Maximum Day Demand plus Fire Flow	Residential Fire flow requirements per City of Toronto Standards, Q_f >64 L/s to 189 L/s	Model Residential Available Fire flow = 50.2 L/s to 269.5 L/s (Ref Fig 7)
	Employment Fire flow requirements per City of Toronto Standards, Q_f = 189 L/s to 317 L/s	Model Employment / High Rise Available Fire flow 75.3 L/s to 742.9 L/s (Ref Fig 7)

The model was run again to confirm the magnitude of the system upgrades required to mitigate the impacts of the proposed developments on the level-of-service provided throughout the service area. A series of system upgrades is given in **Table 3** below:

Table 3 Recommended Watermain Upgrades

Road	From	To	Length (m)	Type of Upgrade	Ex. Diam (mm)	Prop. Dia. (mm)
Overlea Blvd.	West of Don River	Thorncliffe Park	490.3	Rehab	400	400
Beth Nealson Dr	Thorncliffe Park Dr	Wicksteed Ave	500.4	Upsize	300	400
Wicksteed Ave	Beth Nealson Dr	Leslie St	350.1	Upsize	300	400
Leslie St	Wicksteed Ave	Research Rd	97.0	Upsize	200	300
Leonard Linton Park Easement	Wicksteed Ave	Vanderhoof Ave	184.9	Upsizing	150	200
Aerodrome Cres	Vanderhoof Ave	Thomas Elgie Dr	222.4	Upsizing	200	300
Brentcliffe Rd	Vanderhoof Ave	Eglinton Ave	184.5	Upsizing	200	300
Vanderhoof Ave	Brentcliffe Rd	Fut Block A1/A2 Easement	235.3	Upsizing	150	200
Vanderhoof Ave	Fut Block A1/A2 easement	Laird Dr	197.2	Upsizing	200	300

The impacts of the increased densities can be mitigated through approximately 2.5 km of local system improvements. The detailed modeling memorandum is found in **Appendix C-2.**

4.3 Sanitary and Combined Sewers

The sanitary flow rates for the revised models were based on the City of Toronto's criteria as noted in the following **Table 4**:

Table 4 – Sanitary Flow Rate Design Criteria

	Generation Rate	Peaking Factor
Residential	240 Lpcd	Harmon
Commercial, Office, Retail, Community Centre	180,000 L/ha/day	None

Using the provided densities and generation flow rates noted above, peak sanitary flows for each proposed development were calculated and are summarized in **Table 5** below:

Table 5 – Eglinton Development Statistics and Sanitary Flow

Address	Building No.	Population	Res. Flow (L/s)	Peak Res. Flow (L/s)	Office Area (m^2)	Office Flow (L/s)
815-845 Eglinton Ave	1	375	1.04	4.20	3,200	0.67
	2	1,056	2.93	11.10	6,950	1.45
	3	565	1.57	6.20	0	0
	4	0	0	0	8,990	1.87
	5	636	1.77	6.93	0	0
	6	198	0.55	2.28	5,340	1.11
849 Eglinton Ave	1	508	1.41	5.61	4,370	0.91
	2	475	1.32	5.26	0	0
	3	307	0.85	3.47	8,250	1.73
939 Eglinton Ave	1	638	1.77	6.94	1,285	0.27
	2	327	0.91	3.69	555	0.12
	3	671	1.86	7.27	0	0
	4	0	0	0	4,300	0.90
943-957 Eglinton Ave	1	596	1.66	6.51	1,400	0.29
	2	203	0.56	2.33	0	0
	3	552	1.53	6.06	0	0
	4	641	1.78	6.97	0	0

In total, the proposed densification in Area "A" will likely generate approximately 85 L/s to the existing infrastructure on Eglinton Avenue East.

The hydraulic grade line (HGL) profiles from the existing conditions were reviewed and analyzed for both main reaches (Eglinton Avenue East and Laird Drive) and for all four of the modelling scenarios. The branch along Eglinton Avenue East is part of the foul system and the branch along Laird Drive is part of the combined system.

- Under the "Baseline DWF (dry weather flow)" scenario, the Eglinton Avenue East HGL is completely eliminated, suggesting that the HGL is largely produced from the inflow and infiltration (I/I) along this branch. Similarly, the Laird Drive is largely contained within the pipes, equally suggesting that that the surcharging conditions are a direct result storm flows within the combined system.
- Under "Baseline 2-year" scenario, the Eglinton Avenue East HGL shows significantly less surcharging while the backwater condition is still occurring along the end of this branch. The Laird Drive HGL shows some surcharging along the northern part of the branch and near the limit of the study area however, the surcharging is below the 1.8m limit.
- Under the "Baseline 100-year" scenario, the Eglinton Avenue East HGL shows surcharging to ground on Eglinton Avenue, and a backwater condition within the valley. The Laird Drive HGL shows slight surcharging along the entire branch however the surcharging conditions meet the requirements of the City of Toronto and does not reach the 1.8 m limit below existing road centerline grades.
- Under the "Baseline May 12, 2000" scenario, the Eglinton Avenue East HGL shows surcharging at or below the surface along Eglington Avenue, while the Laird HGL indicates surcharging near the upstream portion of the study area. The surcharging conditions remain below the 1.8m threshold.

The simulations were reviewed on two branches – along Laird Drive and along Eglinton Avenue East. The HGL for both branches were reviewed for the 2-year and 100-year events, and it was observed that both show similar results when existing conditions and post-development conditions are compared. Additional discussions for each run follows.

Laird Drive: The results of the combined system modelling along Laird Drive indicates no adverse impacts to redeveloping the various sites along the west side of Laird Area "B". The 2-year storm HGL is similar under existing conditions and post-development conditions; that is to suggest that the development flow was similar to the existing flow removed. Similarly the 100-year storm HGL also looks comparable under existing conditions and post-development condition, suggesting that the development flow was similar to the existing flow removed. In terms of risk of basement flooding, the freeboard is lower than 1.8m on the first two pipe segments for both existing and future conditions. Therefore development within Area "B" does not adversely affect existing conditions.

Eglinton Avenue East: The 2-year storm HGL looks very similar under existing conditions and post-development conditions. The flow at the study boundary is slightly lower in post-development conditions than existing conditions, suggesting that the development flow added was less than existing conditions. This is likely due to replacement of inflow and infiltration flows with sanitary effluent. The 100-year storm HGL very similar under existing conditions and post-development conditions. The flow

at the study boundary is approximately the same as existing conditions, suggesting that the development flow added was similar to the existing flows removed. Under the 100-year storm, the surcharging on Eglinton Ave reaches surface and exceeds the 1.8m limit. Please refer to **Figures 6.5 and 6.6** found in **Appendix C-1** and **Sewer Profiles** found in **Appendix C-2**. Based on the modelling results, the following sewer segment, noted in **Table 6** do not meet the level of service expected by the City of Toronto:

Table 6 – Area "A" Sewer Upgrades

From MH	To MH	Length(m)	Existing diameter (mm)	Slope (m/m)
4119116042	4120716094	54.4	250	0.01151
4120716094	4122116139	46.8	250	0.00115
4122116139	4122816139	7.8	250	0.20218
4122816139	4131016115	84.6	250	0.00401
4131016115	4131516117	5.4	250	0.04259
4131516117	4138516096	73.4	250	0.00107

4.4 Hydrogeolgy and Groundwater

City of Toronto staff have advised of high groundwater levels within the study area, as identified through active development projects in the area. Should groundwater need to be discharged to the combined/sanitary system, as identified through the preparation of future development applications within the study area, the proponent will need to satisfy Toronto Water that sufficient capacity exists within the system to handle any potential discharge of groundwater.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the modeling and the expected local growth, we recommend the following:

5.1 Sanitary Sewers

- New development shall demonstrate that sufficient capacity is available to service future intensification. Where new/upgraded infrastructure has been identified as per Table 6 of this report, development proponents will have to make satisfactory arrangements with the City of Toronto to design/construct/fund the identified upgrades to attain a level of service acceptable to the City of Toronto.
- An inflow/infiltration study for infrastructure within this water should be conducted to identify the source of the unusually high inflow identified in the model. Remove the source of I/I would further improve sewer capacity.

5.2 Storm Sewers

- New developments shall comply with the TWWMFG and must achieve a minimum peak flow reduction of 50% or greater.

5.3 Combined Sewers

- New developments shall comply with the TWWMFG and must achieve a minimum net combined (storm plus sanitary) peak flow reduction of 50%.
- As future development along this stretch of road is serviced by combined sewers, a 'net reduction' in combined flows (sanitary effluent + storm run-off) is expected due to reduction in in storm runoff from implemented lot-level controls. Since a net reduction is expected, no improvements to the combined sewers are recommended.
- The City of Toronto should undertake a feasibility study for providing separated storm and sanitary sewers on Laird Drive. This should be coordinated with the recommended streetscape improvements of this plan.

5.4 Water

- Watermain upgrades identified in this report are to be scheduled in the city's capital works budget to ensure an adequate water supply for long term growth in the area. Alternatively the city may choose to have developers upfront the cost of the identified infrastructure which could partially offset DC credits.

6.0 COST ESTIMATE FOR RECOMMENDED IMPROVEMENTS

Please refer to **Appendix C-4** for a complete estimate of probable cost to implement the recommendations outlined in this report.

Respectfully Submitted:

SCS Consulting Group Ltd.

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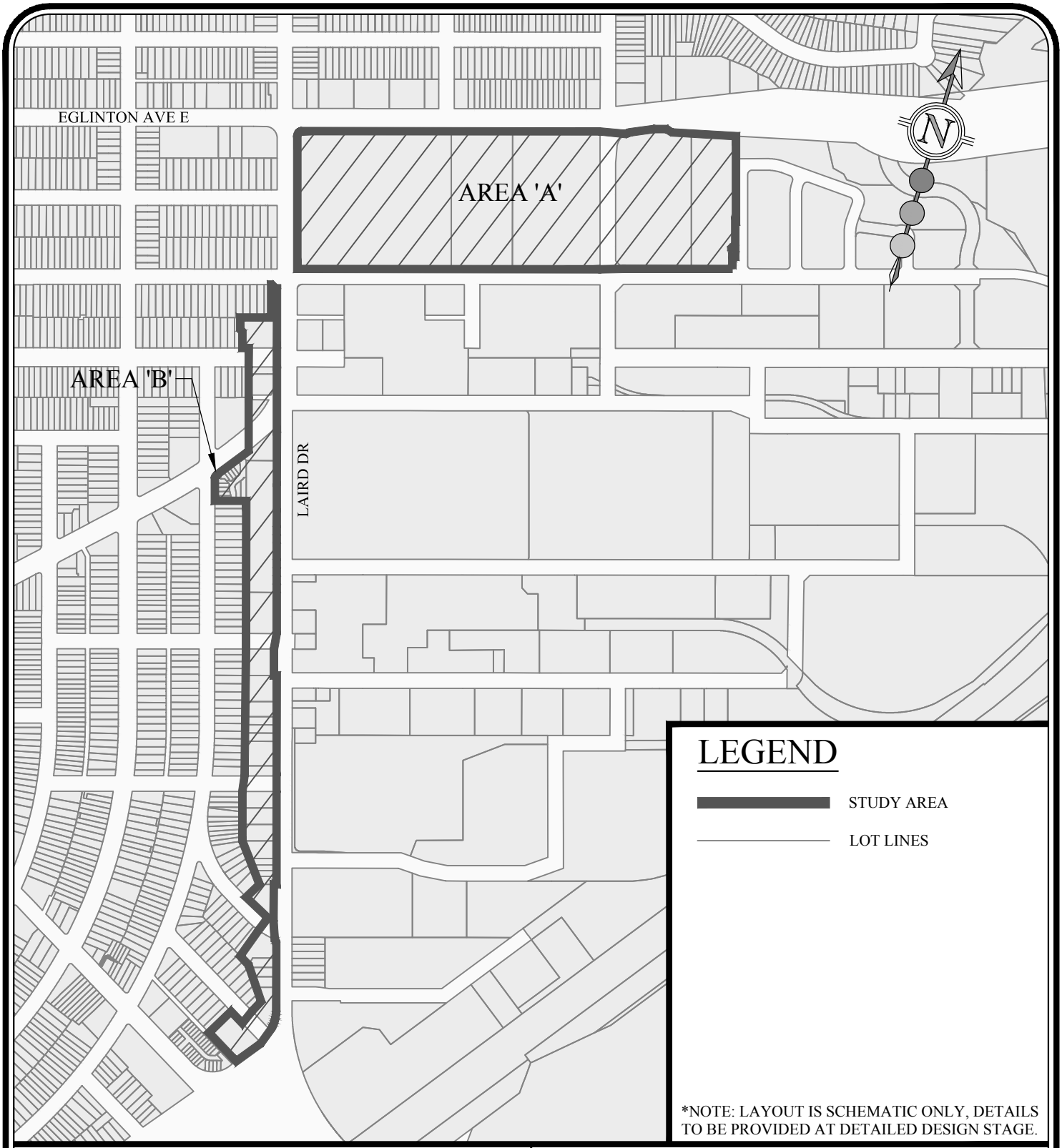
APPENDIX C-1

FIGURES



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