



Background Transportation Discussion Paper (Draft Final)

Promenade Centre Secondary Plan Study

Version 2

City of Vaughan
December 5, 2019



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1 Introduction

The City of Vaughan has initiated the Promenade Centre Secondary Plan (PCSP) and supporting Comprehensive Transportation Study (referred to as ‘the study’ from herein) to guide future development of the area. The study reviews the existing transportation policies and network within the study area and surrounding context to determine future supporting transportation networks and required transportation improvements.

The study builds on a variety of provincial, regional and City plans and policies, including the Growth Plan for the Greater Golden Horseshoe (GGH) (2017), Metrolinx 2041 Regional Transportation Plan (RTP) (2018), York Region Transportation Master Plan (TMP), York Region Official Plan (OP), Vaughan Official Plan (OP), Green Directions Vaughan (2009), and the Vaughan TMP (2012 and on-going 2019 TMP Update).

The study examines the urban form and transportation network using an integrated approach. The goal of the study is to support growth and maximize opportunities for connections within the Promenade Centre plan area and between the plan area and the greater city and region as whole. A comprehensive transportation analysis will be conducted to:

- Provide understanding of the existing transportation network for all modes of travel;
- Conduct a multi-modal transportation evaluation for the existing conditions to assess the safety and convenience for travellers including pedestrians, cyclists, transit users and drivers;
- Identify the needs and opportunities for the study area;
- Evaluate the impact of land use scenarios on the multi-modal transportation network to inform the selection of a preferred land use scenario;
- Evaluate the preferred land use scenario and identify a supporting balanced, multi-modal, Complete Streets transportation network; and
- Provide recommendations for phasing and implementation and provide preliminary engineering cost estimates.

This Background Transportation Discussion Paper reviews the provincial, regional, and municipal planning context. It documents existing conditions, including: the planning context, travel patterns, as well as the existing road, transit, pedestrian, and cycling network. Future background traffic conditions are analyzed using an EMME-based subarea macro demand model and Synchro microsimulation analysis. Based on the existing and future background analysis, the last section of this report provides a draft transportation challenges and opportunities.

1.1 Study Area

Figure 1-1 illustrates the Secondary Plan study area, as well as a broader transportation study area, bounded by New Westminster Drive to the north, Atkinson Avenue to the east, Clark Avenue to the South, as well as the area north of Centre Street west of New Westminster Drive bounded by Katerina Avenue and Vaughan Boulevard. The

comprehensive transportation analysis will be conducted for the broader transportation area, including the review of existing conditions and testing the understanding the impacts of the future development in the Centre on surrounding areas.

Figure 1-1: Study Area



2 Planning Context

The Promenade Centre Secondary Plan (PCSP) Study will be developed within the context of provincial, regional, and municipal planning policies and initiatives. This section highlights the key planning documents influencing the study.

2.1 Provincial Planning Context

Several provincial plans and policies provide the basis and guidance for the transportation vision for the City of Vaughan. Further, updates to provincial plans may directly influence both York Region and City of Vaughan infrastructure needs, thus requiring periodical updates to the City's plans including the PCSP Study.

2.1.1 Provincial Policy Statement, Ontario (2014)

The Provincial Policy Statement (PPS) provides direction on land use planning and development, and the transportation system.

Direction related to transportation includes the following policies:

- Safe, energy efficient transportation systems that move people and goods and address projected needs;
- Use of Travel Demand Management (TDM) strategies to maximize efficiency;
- A multimodal transportation system that provides connections within and among transportation systems and modes including across jurisdictional boundaries;
- Land use patterns that minimize length and number of vehicle trips to support transit and active transportation;
- Integration of transportation and land use considerations at all stages of planning;
- Protect for major goods movement facilities and corridors; and
- New development should be compatible with the long-term purposes of the corridor.

2.1.2 Growth Plan for the Greater Golden Horseshoe (GGH), Ontario Ministry of Municipal Affairs and Housing (2017)

The Growth Plan for the GGH came into effect on July 1, 2017, replacing the previous plan adopted in 2006. The Growth Plan, building on the Provincial Policy Statement, provides a strategic framework for managing growth in the Region, including specific land use planning policies, goals, and measurable targets. The Growth Plan defines specific policies for where and how to grow. The Growth Plan's horizon by which the goals and policies of the plan should be achieved is 2041. The Promenade Centre Study Area is classified as a *major transit station area* (MTSA) under this plan.

Growth and intensification policies for *major transit station areas* are as follows:

- Major Transit Station Areas (MTSAs) are strategic growth areas where intensification is directed. The Promenade Terminal is situated in the study area, and is served by several existing vivaNEXT lines;

- MTSAs are to be planned and designed to be transit supportive and achieve multi-modal access to stations and connections to nearby major trip generators; and
- MTSAs should meet a minimum density target of 160 residents and jobs per hectare.

Amendments to the Growth Plan in 2019 include establishing lower targets with Ministerial approval, as long as it is demonstrated that the target cannot be achieved due to prohibitions or restrictions on a significant portion of the lands within the delineated area; or there are limited number of jobs or residents associated with the built form, but a major trip generator or feeder service will sustain high ridership at a station or stop.

2.1.3 2041 Regional Transportation Plan, Metrolinx (2018)

The 2041 Regional Transportation Plan (RTP) sets the Greater Toronto and Hamilton Area's (GTHA's) multi-modal long-range regional transportation vision, goals, objectives, and priorities. The RTP supports and is aligned with the PPS and Growth Plan. Building on the previous RTP, the Big Move (2008), this plan provides strategic direction for planning, designing and building a regional transportation network that enhances quality of life, the environment, and prosperity.

Direction related to this study include the following:

- Expand first- and last-mile choices at all transit stations;
- Place universal access at the centre of all transportation planning and designing activities;
- Eliminate transportation fatalities and serious injuries as part of a regional Vision Zero program;
- Make TDM a priority;
- Plan and design communities to support and promote the greatest possible shift in travel behavior, consistent with Ontario's passenger transportation hierarchy; and
- Rethink the future of parking.

The Highway 7 West / Vaughan Metropolitan Centre BRT is the most relevant project to the study area. The status of this project is described in more detail in Section 2.2.3.

2.1.4 Transit-Supportive Guidelines, Ministry of Transportation (2012)

Identifies best practices for transit-friendly land-use planning, urban design, and operations. The Guidelines outline many strategies for creating transit supportive environments relevant to this study:

- Create fine-grained and interconnected networks, to provide efficient transit services and connections to transit stops;
- Eliminate unnecessary jogs or breaks in the network;
- Spacing of arterial and collector roads should support a maximum 400m walk from the interior of a block to a transit stop, and facilitate higher levels of walking and cycling;

- Access routes to transit stops, such as pedestrian pathways or local roads, should be spaced no greater than 200m apart;
- Improve pedestrian and cycling infrastructure to increase convenient and comfortable access to transit;
- Create additional street connections where possible that can help to minimize travel distances to transit;
- Minimize block lengths to promote greater connectivity and enhance the walkability of neighbourhoods;
- Extend existing park and open space networks, where possible, to link with transit stops and station areas; and
- Design complete streets to reflect both the existing and planned land use, urban form and transportation contexts.

2.1.5 407 Transitway (Ongoing)

The Ministry of Transportation (MTO) is currently conducting the Planning, Preliminary Design, and EA for the 407 Transitway (Huronario Street in Burlington to Brock Road in the City of Pickering). The 407 Transitway would be a fully grade separated transit facility on an exclusive right-of-way, running along the Highway 407 Corridor. The 407 Transitway will be implemented initially as Bus Rapid Transit (BRT) with the opportunity to convert to Light Rail Transit (LRT) in the future.

The EA for the section of the 407 Transitway north of the Promenade Centre study area, between Highway 400 and Kennedy Road, has been completed. The EA proposed the Bathurst Station, which is located to the northeast of the Bathurst Street and Highway 407 intersection. Although this station is outside of the Promenade Centre Secondary Plan Study area, facilitating access and connections to the Highway 407 stations, such as the proposed Bathurst Station, should be considered.

2.2 Regional Planning Context

There are several York Region planning documents that provide policy direction for the Promenade Centre Secondary Plan Transportation Study.

2.2.1 York Region Official Plan (2010)

The York Region Official Plan (YR-OP) describes how York Region plans to accommodate future growth and development while meeting the needs of existing residents and businesses. The YR-OP recommends policies that emphasize a reduction in automobile reliance and an increase in active transportation facilities, not only to meet sustainability goals, but to also tackle public health concerns. The plan links the design of communities to human health outcomes. Recommendations and directions that may be valuable to the development of the Promenade Centre Secondary Plan Transportation are as follows:

- **Healthy Communities:** reduce vehicle emissions
- **Economic Vitality:** tied to the efficient movement of goods and services in Regional Centres and Corridors

- Urbanizing Region: incorporate parking management policies and standards that include reduced minimum and maximum parking requirements, on-street parking and preferential locations for carpooling, car-sharing spaces and bike storage requirements.

The YR-OP regional street network (on Map 12) designates a right-of-way (ROW) width of up to 45.0 m along Bathurst Street within the study area.

The YR-OP also identifies transit modal split targets which provides policy direction to encourage transit use in the study area as much as possible. The YR-OP transit modal split targets by 2031 are as follows:

- 30% during peak periods in the Urban Area; and
- 50% in the Regional Centres and Corridors by 2031. Centre Street and Bathurst Street within the study area are designated as Regional Corridors.

2.2.2 York Region Transportation Master Plan (2016)

York Region's Transportation Master Plan (TMP) addresses the Region's mobility needs to 2041 and beyond. It provides a 25 year outlook to:

Create an advanced interconnected system of mobility in the GTHA in order to give York Region residents and businesses a competitive advantage, making York Region the best place to live, work and play in the GTHA.

The York Region TMP has five objectives:

1. Create a world class transit system;
2. Develop a road network fit for the future;
3. Integrate active transportation in Urban Areas;
4. Maximize the potential of employment areas; and
5. Make the last mile work.

There are five main policy areas developed as part of the TMP:

- Finer grid network
- Corridor evolution (complete streets)
- Commuter parking management
- Goods movement network
- Boulevard jurisdiction

The recommendations for the 2041 networking include:

- Centre Street west of Bathurst Street, and Bathurst Street north of Centre Street to Highway 7 a Rapid Transit Corridor, and New Westminster Drive / Atkinson Avenue part of the Frequent Transit Network (Map 7 in the TMP), New Westminster Drive south of Centre Street, Clark Avenue from New Westminster Drive to Yonge Street a future rapid transit corridor (Map 7 and 8 in the TMP);

- Separated cycling facilities along Centre Street west of Bathurst Street and dedicated cycling facilities east of Bathurst Street and separated cycling facilities along the length of Bathurst Street through the study area (Map 9 in the TMP);
- Upgrades to Bathurst Street south of Centre Street in the 2022-2026 horizon (Map 17 in the TMP).

2.2.3 York Region Transportation Mobility Plan Guidelines for Development Applications (2016)

The Transportation Mobility Plan provides the tools necessary to implement and connect the policies and requirements of York Region's Official Plan and Transportation Master Plan. As an update to the Transportation Impact Study Guidelines (2007), the Plan is focused on transit, active transportation and strategic measures that will reduce the travel demand and minimize single-occupant vehicle trips to and from the proposed developments. The Plan aims to expedite the development review process and is a combination of multimodal plans along with traditional traffic impact analyses.

A Transportation Mobility Plan is required when the proposed development generates 100 or more person trips. This plan is prepared in support of the Official Plan Amendment, Secondary Plan, Block Plan, Zoning Bylaw Amendment, draft plan of subdivision and site plan applications.

The main objectives and requirements of a Transportation Mobility Plan to support a Secondary Plan application are:

1. To describe in detail the **impact of the proposed land use or policy changes** on the existing transportation system for all modes of transportation.
2. To identify a more defined **external and internal transportation network** to accommodate all modes of transportation. This includes finer grid road network, active transportation network and detailed transit network.
3. To identify **other transportation infrastructure improvements and missing links for all modes of transportation** required above and beyond those identified in the Regional and local Municipal Transportation Master Plans or the Region's 10-Year Roads and Transit Capital Construction Programs.
 - Particularly for secondary plans, the travel demands between intersections and mid-block capacities should be reviewed and assessed to determine if transportation infrastructure or additional capacities are required. Assessments could include screenline analysis by identifying traffic volumes, person trips and/or transit ridership.
4. To identify **development phasing plans** based on the planned and scheduled proposed transportation infrastructure improvements.
5. To identify high level **Transportation Demand Management (TDM) plans**, measures and initiatives to achieve the non-auto modal split and to reduce single-occupant-vehicles.
6. To identify a detailed **implementation plan** in order to achieve complete community building objectives. These requirements will be reflected in the Transportation

Mobility Plan report, Secondary Plan report and schedules to guide the draft plans of subdivision and site plans.

The Mobility Plan emphasizes the importance of reviewing and assessing existing and future conditions for all modes of transportation. To that end, York Region has developed its preferred multimodal level of service (LOS) evaluation approach to address the performance requirements for driving, walking, cycling and transit. These multimodal LOS evaluation, in combination with the other best practice evaluation framework, will be used to examine the existing conditions for all modes of transportation in this study. A high-level summary of the framework and the LOS targets are summarized in the following sections.

Automobile Level of Service

There are two criteria required for the automobile mode level of service performance: vehicle delay and volume-to capacity ratio. Both of these criteria are to be completed and included in the Transportation Mobility Plan Study.

Automobile LOS and V/C Target: D (0.85) or better for urban area and LOS C (0.70) or better for rural area

Transit Level of Service

There are three required criteria for the transit mode level of service performance:

1. Access to the transit stops, measured through a development's potential transit riders' straight line walking distance to transit stops;
2. Transit headways, measured through the time interval between transit vehicles for a transit corridor and;
3. Transit vehicle performance at the intersection approach, measured by examining the delay and volume-to-capacity ratio for curb lanes.

Transit LOS Target: C or better for Access to Transit Stops and Transit Headways (<15 minutes) and LOS D or better (<0.9) for Intersection Approach.

Pedestrian Level of Service

The pedestrian level of service is measured at the segment level (between two or more intersections) and at the intersection level. Criteria used to assess Segment LOS for pedestrians are:

- The sidewalk / multi-use path width; and
- The buffer width or separation distance between the sidewalk and the street curb.

In addition to the above, the assessment of pedestrian LOS at signalized or unsignalized intersections incorporates the following supplementary considerations:

- Cross-walk treatment (marked, unmarked, high-visibility zebra markings); and
- Pedestrian clearance time.

Segment LOS Target: a score of C or better (≥ 1.5 m curb-faced sidewalk, buffer > 0 m)
Intersection LOS Target: a score of C or better (≥ 1.5 m curb-faced sidewalk, buffer > 0 m, pedestrian signal head with sufficient pedestrian clearance time, clearly delineated cross-walk)

Bicycle Level of Service

Similarly to pedestrian level of service, the bicycle LOS is measured at the segment level (between two or more intersections) and at the intersection level. Criteria used to assess Segment LOS for cyclists are:

- The type of cycling facility (dedicated, separated, shared);
- The width of the cycling facility; and
- The buffer width or separation distance between the facility and the street curb.

In addition to the above, the assessment of cyclist LOS at signalized or unsignalized intersections incorporates the following supplementary consideration into the assessment:

- Presence of bicycle box, clearly delineated bicycle treatment or bicycle signal head.

Segment LOS Target: a score of C or better (> 1.5 m dedicated cycling facilities, buffer ≥ 0 m)
Intersection LOS Target: a score of C or better (> 1.5 m dedicated cycling facilities, buffer ≥ 0 m, bicycle box or clearly delineated bicycle treatment or bicycle signal head)

A checklist elaborating on the above assists in the development of a comprehensive TDM Plan (discussed in **Section 2.3.2**).

2.2.4 York Region vivaNext (2018)

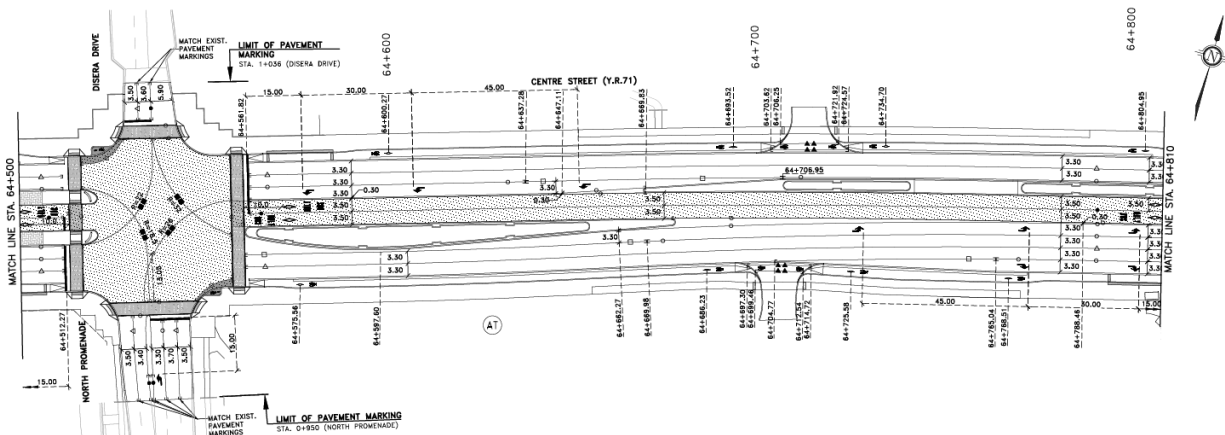
VivaNext is the plan to implement the rapid transit network in York Region. The vivaNext network is made up of bus rapid transit, subway extensions and light rail transit. As noted in **Section 2.1.3**, a significant regional transit project that serves the Promenade Centre study area is the Viva Orange (the Highway 7 West / Vaughan Metropolitan Centre BRT). Phase 1, the rapidway between Edgeley Boulevard (Vaughan Metropolitan Centre) and Bowes Road is complete (shown in **Figure 2-1**). Phase 2 is currently under construction, which will extend the rapidway east of Bowes Road, through Centre Street and Bathurst Street in the PCSP study area to the Richmond Hill Centre Terminal. The construction of Phase 2 is anticipated to be completed in late 2019.

Figure 2-1: vivaNEXT Project Map (2018)



The rapidway will bring dedicated transit lanes along Bathurst Street and Centre Street, as well as wide sidewalks, planter boxes, and raised cycle tracks. **Figure 2-2** shows an example of the lane configurations on Centre Street west of Disera Drive.

Figure 2-2: Viva Orange Centre-Bathurst BRT Pavement Marking, Centre Street East of Disera Drive



Source: vivaNext BRT H2-West & H2-East Pavement Marking and Signage, YRT (September 2017)

A future Viva curbside connection is also identified between the Disera-Promenade Station and Clark, Steeles, Commer/Drewery, and Finch Stations, as shown in dashed gray lines in **Figure 2-1**. It should be noted that while there is a long-term vision for the curbside Viva service between Disera-Promenade station and Clark station to the Finch GO Bus Terminal, there is not funding commitment for this project to date.

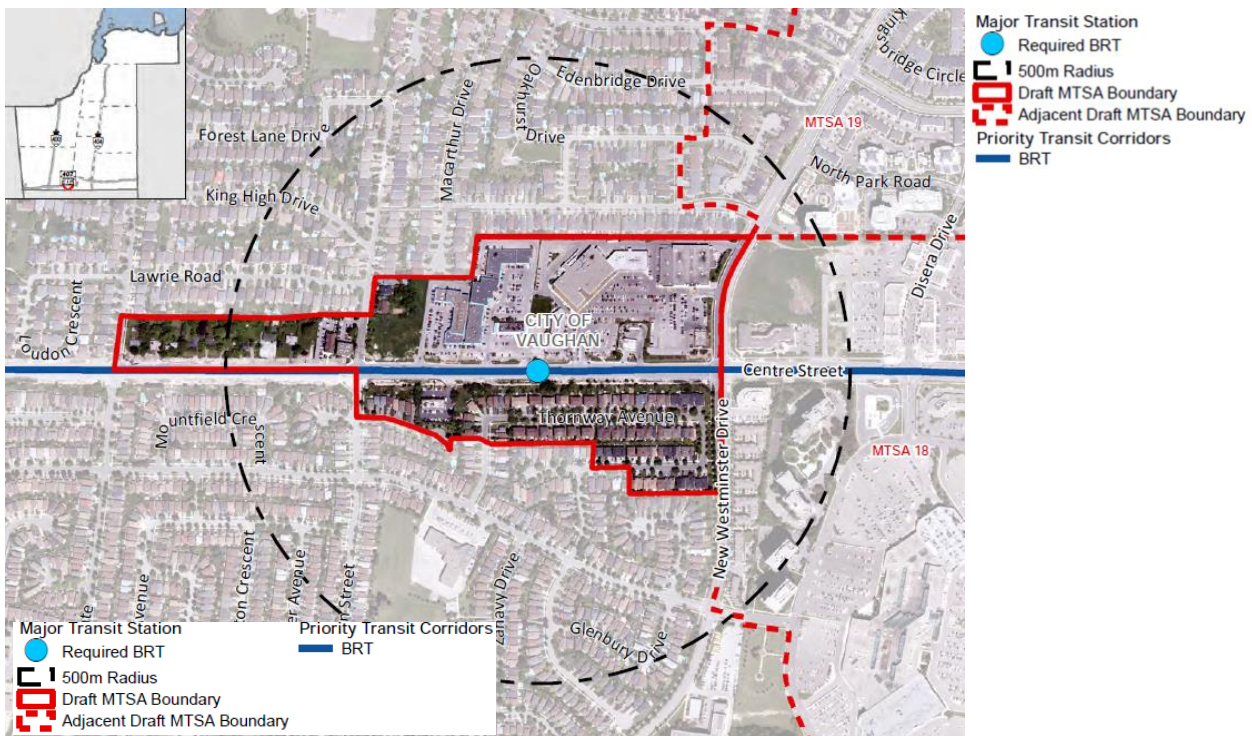
2.2.5 Draft Major Transit Station Area and Additional Strategic Growth Areas (2019)

In light of the regional Growth Strategy, York Region initiated an Intensification Strategy. Major Transit Station Areas (MTSAs) form part of the Region's intensification strategy. Generally, MTSAs are defined as a 500 to 800 metre radius around a transit station. The Draft MTSA considers existing Growth Plan minimum density targets and proposes new density targets for certain stations.

The PCSP study area encompasses three adjacent station areas. On the west side of the study area is Taiga station, at the centre of the study area is the Disera-Promenade BRT station, and to the north of the study area, the Atkinson BRT Station, as shown in **Figure 2-3**, **Figure 2-4**, and **Figure 2-5** respectively. The existing land use densities at Taiga MSTa and Atkinson MSTa are relatively low, with mostly single family dwelling units and low-rise commercial plaza buildings. The Disera-Promenade MSTa includes some high-rise residential buildings and low-rise commercial buildings.

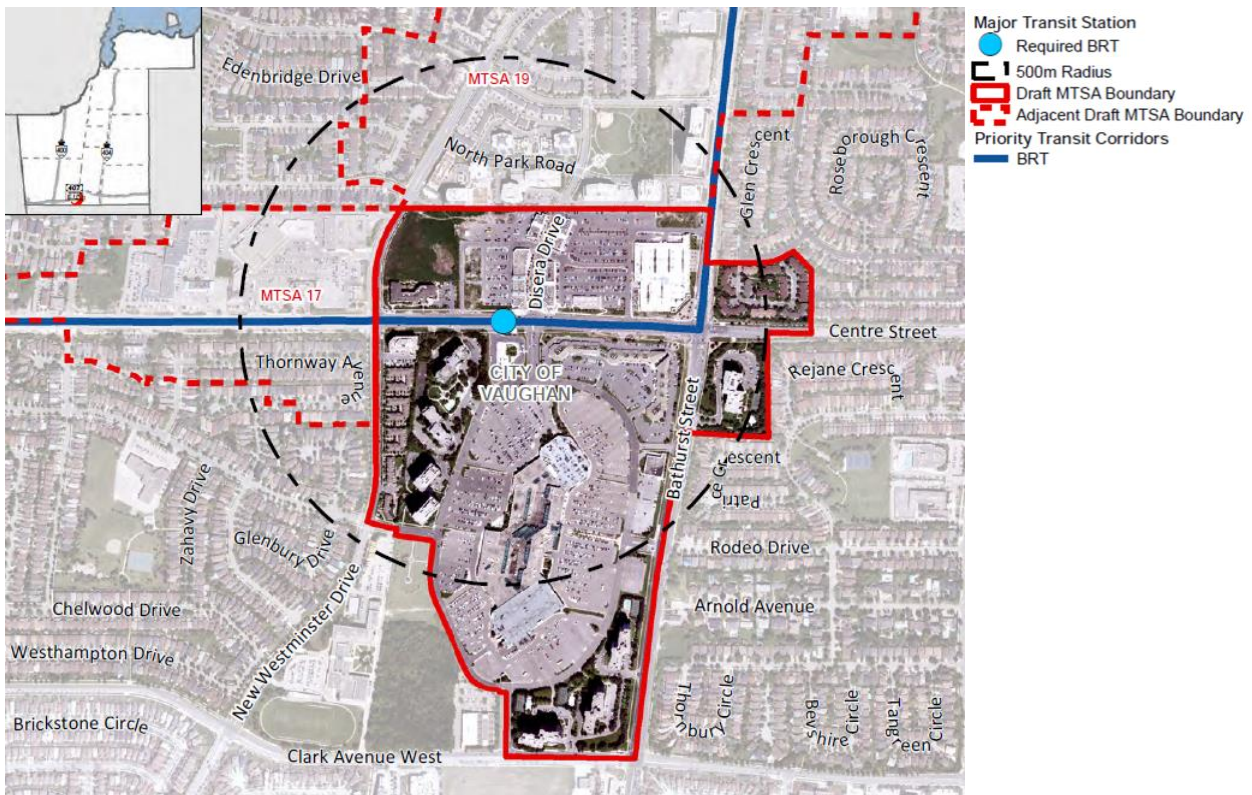
Density targets for each station are provided in **Table 2-1**.

Figure 2-3: Taiga MTSA Location



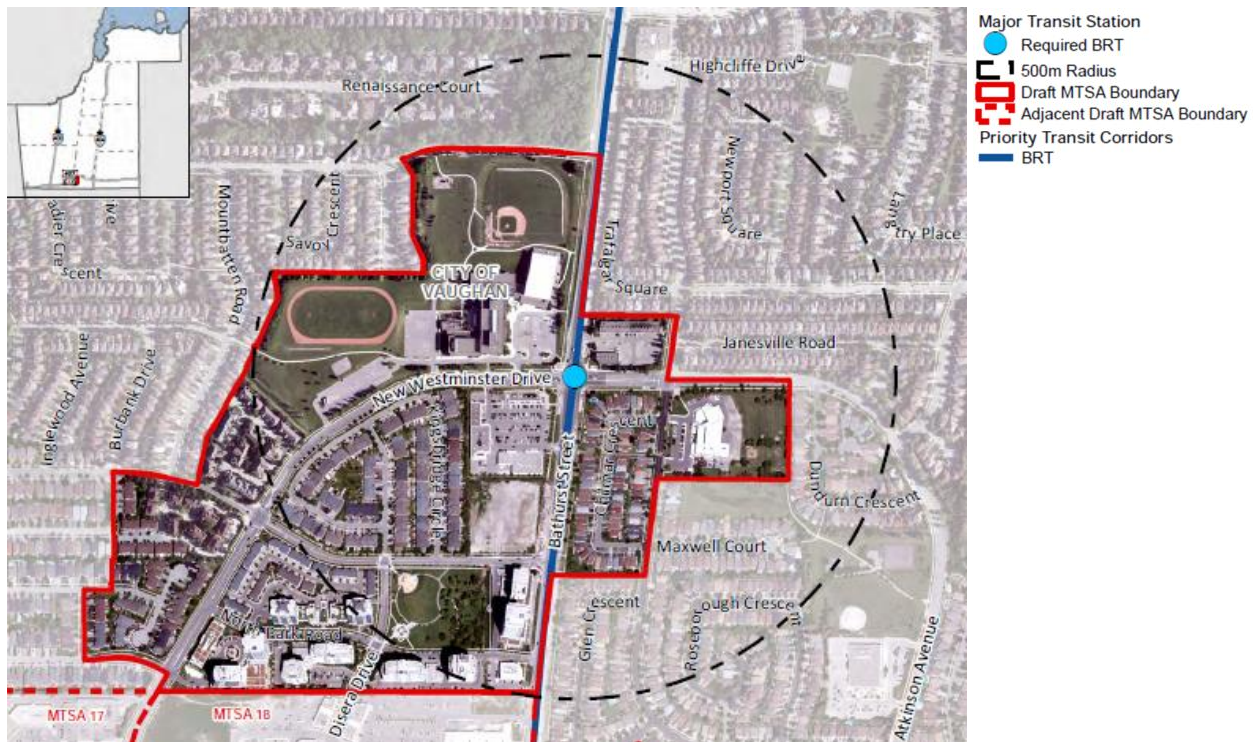
Source: Draft Major Transit Station Areas and Additional Strategic Growth Areas (April, 2019)

Figure 2-4: Disera-Promenade MTSA Location



Source: Draft Major Transit Station Areas and Additional Strategic Growth Areas (April, 2019)

Figure 2-5: Atkinson MTSA Location



Source: Draft Major Transit Station Areas and Additional Strategic Growth Areas (April, 2019)

Table 2-1. Draft MTSA Targets

| Station Name | MTSA ID | Growth Plan Min. Density Target | Proposed Density Target |
|------------------------------|---------|---------------------------------|-------------------------|
| Taiga BRT Station | 17 | 160 | 160 |
| Disera-Promenade BRT Station | 18 | 160 | 200 |
| Atkinson BRT Station | 19 | 160 | 160 |

2.3 Transportation Demand Management Programs

2.3.1 York Region MyTrip Program (2017)

MyTrip is a program designed to help residents make informed transportation choices that will improve their travel and use sustainable ways of travel, such as carpooling, public transit, cycling, and walking.

York Region conducted a pilot program between 2015 and 2017 to help residents in six newly developed neighbourhoods through an individualized travel planning program. The program involved working closely with residents to understand their travel patterns, explore options that are available, and outlining opportunities that work best for them. Residents that were interested in trying public transit were provided with a pre-loaded PRESTO card to get them started.

York Region is currently (2018) working with new development communities to invite residents in new development communities to participate in a MyTrip outreach event. The program involves a travel ambassador speaking with the resident about their transportation options, with a free incentive such as a preloaded PRESTO card to get them started.

2.3.2 York Region Transportation Mobility Plan Guidelines for Development Applications (2016)

Managing the demand for travel generated by new developments is a powerful strategy for controlling costs, mitigating environmental impacts, and permitting developments to proceed in road capacity constrained areas. To that end, the York Region Official Plan (2016) established policies asking for appropriate Transportation Demand Management (TDM) measures be identified in transportation studies and in development applications.

The Mobility Plan considers any policy or program that reduces single occupant vehicle trips during peak travel periods a TDM strategy. It outlines when a TDM Plan may be required, the general requirements of the Plan and proposes some TDM considerations, as outlined below:

- **Consider site design**, implement **physical infrastructure** and **integrate facilities** into the regional transportation network, to encourage active transportation;
- **Develop a parking strategy for a variety of modes**, including short and long-term bicycle parking within buildings, shared parking between different uses, and/or carpool parking spaces;
- **Explore transit incentives** to improve access to and from the development; and
- **Identify trip reduction opportunities** and telecommuting with the Region, local municipalities, Smart Commute Transportation Management Associations, and any other agencies.

York Region, in consultation with local municipalities, developed a TDM checklist elaborating on the above consideration to assist in the development of a comprehensive TDM Plan. The checklist, displayed in **Figure 2-6** provides additional details on TDM strategies, which range from improving the streetscape to educating the public.

Figure 2-6: Transportation Demand Management Checklist (Transportation Mobility Plan Guidelines 2016)

| TDM Measures | For Residential Developments | | For Non-Residential Developments | |
|---|------------------------------|--|----------------------------------|----------------|
| | Requirement | Responsibility | Requirement | Responsibility |
| Transit incentives (i.e. PRESTO cards) | Yes | York Region to consider | Yes | Applicant |
| Information packages (YRT/Viva maps, GO schedules, cycling maps) | Yes | York Region to consider and could be distributed at the sales office | Yes | Applicant |
| Communication strategy and physical location to deliver PRESTO cards and information packages | Yes | Applicant | Yes | Applicant |
| Outreach programs | Yes | York Region to consider | Yes | Applicant |
| Pedestrian connections | Yes | Applicant | Yes | Applicant |
| Cycling connections | Yes | Applicant | Yes | Applicant |
| Ped/cycling connections to transit facilities | Yes | Applicant | Yes | Applicant |
| Internal ped/cycling circulation | Yes | Applicant | Yes | Applicant |
| Active transportation network/fine-grid | Yes | Applicant | Yes | Applicant |
| Bicycle parking/shelter | Only applies to condos | Applicant | Yes | Applicant |
| Bicycle repair station | As per local bylaw | Applicant | As per local bylaw | Applicant |
| Bicycle parking | As per local bylaw | Applicant | As per local bylaw | Applicant |
| Benches/receptacles | Case by case | Applicant/ Municipality | Case by case | Applicant |
| Illumination of ped/cycling connections | Case by case | Applicant/ Municipality | Case by case | Applicant |
| Carpool parking | No | - | Yes | Applicant |
| Car share | Only applies to condos | Applicant | Case by case | Applicant |
| Shared-parking between land uses | Case by case | Applicant | Yes | Applicant |
| Parking reduction | Where appropriate | Applicant/ Municipality | Where appropriate | Applicant |
| Real time TV screen | Only applies to condos | Applicant | Where appropriate | Applicant |
| Trip end facilities (i.e. showers) | No | - | Where appropriate | Applicant |
| Membership with Smart Commute | Where appropriate | Applicant | Yes | Applicant |
| School travel planning | Where appropriate | Applicant/School Board/ Municipality | No | - |
| Telecommute | No | - | Where appropriate | Applicant |
| Monitoring program/report | Yes | York Region to consider | Yes | Applicant |

This checklist is to be completed and included as part of the TDM Plan report for further review by Regional and respective local municipal staff.

York Region and local municipalities will consider other recommendations beyond the requirements outlined in the checklist, as long as they meet the objectives of the Regional and local municipal Official Plans and policies.

2.3.3 Metrolinx Smart Commute Program

Smart Commute is a workplace TDM program of Metrolinx and municipalities in the Greater Toronto and Hamilton Area (GTHA). It helps people try out smart travel options such as walking, cycling, transit, and carpooling. Smart Commute includes a number of services and programs, such as:

- Carpool programs, including carpool ride matching, carpool to GO;
- Emergency Ride Home (ERH) reimbursement, which allows a reimbursement of up to \$75 for emergency transportation if there is an unforeseen emergency on a day that the person use a sustainable method to commute to work;
- Triplinx, which is a trip planner and transportation information resource for the Greater Toronto and Hamilton Area. It can customize the trip using options such as maximum walking distance or the mode of transportation;
- Discounted transit pass program; and
- Marketing events, workplace lead training, engagement events, and customized commuter projects.

The Smart Commute Program a membership based program, and employers or property managers need to contact Smart Commute to discuss potential programs to be set up and the fees for the membership. The Promenade Centre Secondary Plan area is located in the Smart Commute North Toronto Vaughan service area. Based on the 2017 Smart Commute Annual Survey results, commuters from Smart Commute workplaces drive alone 14% less than the average GTHA commuter, and 49% of respondents commute to/from their workplace using a sustainable mode.

2.4 City of Vaughan Planning Context

2.4.1 Vaughan Official Plan (2010)

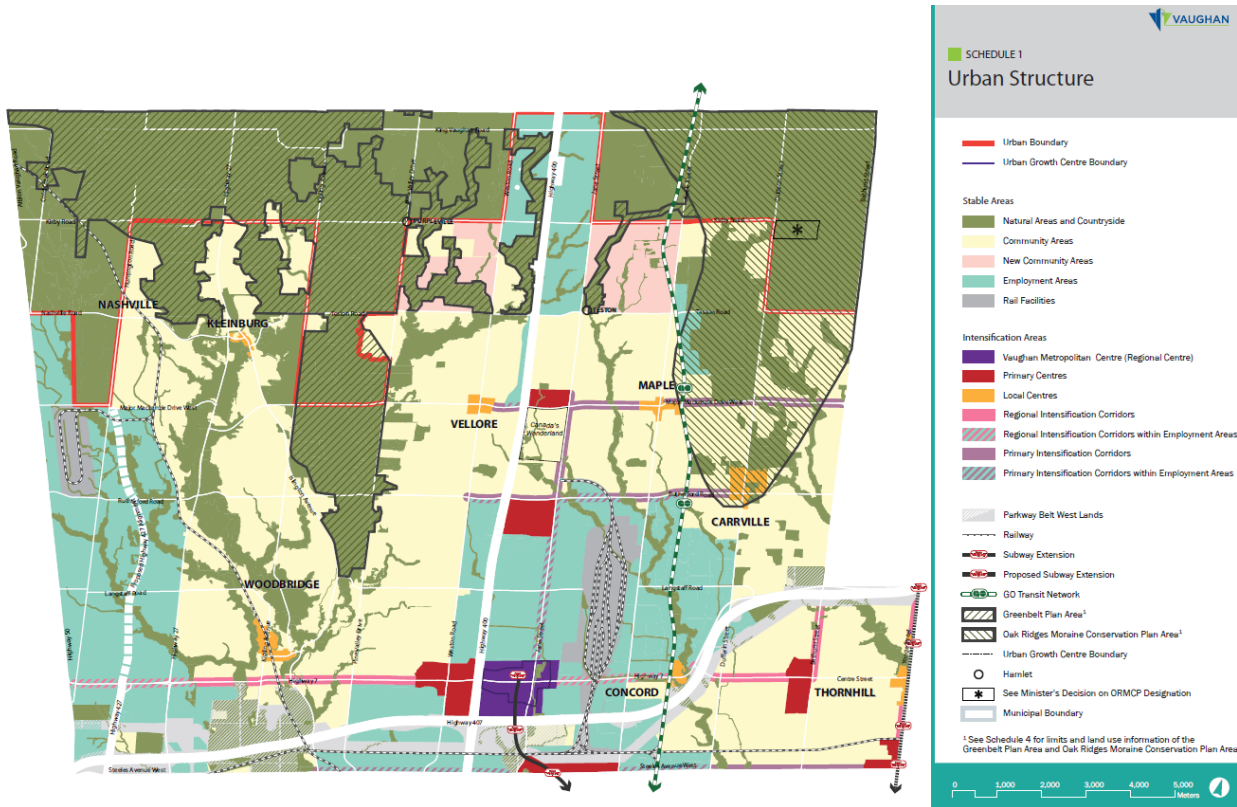
The Vaughan Official Plan (VOP) is part of a Growth Management Strategy endorsed by the Ontario Municipal Board. The Plan intent is to “shape the future of the City and guide its continued transformation into a vibrant, beautiful and sustainable City”.

As shown in **Figure 2-7**, the Promenade Centre study area falls within a Primary Centre, which is defined as a key development and intensification area that is mixed-use and transit-oriented. Related to transportation, Primary Centres will be planned to:

- Have a fine grain of streets suitable to pedestrians and cyclists; with appropriate internal links and links to the surrounding Community Areas which may take the form of sidewalks or greenways (2.2.5.7.f.);

Centre Street, between Highway 400 and Bathurst Street, as well as Bathurst Street between Centre Street and Highway 7, are designated as Regional Intensification Corridors. Regional Intensification Corridors are also a focal area for intensification supportive of higher-order transit.

Figure 2-7: City of Vaughan Official Plan, Schedule 1, Urban Structure



Source: City of Vaughan Official Plan – Volume 1 - 2017 Office Consolidation, Schedules, 2017

Several policies in Chapter 4-Transportation are also of particular relevance to the PCSP study:

- To establish a comprehensive transportation network that allows a full range of mobility options, including walking, cycling and transit (4.1.1.1);
- That public transit shall be the primary focus for expanding Vaughan’s transportation network capacity to 2031. Consistent with the York Region Official Plan, an overall transit modal split of 30% during peak periods is targeted for the City as a whole and a transit modal split of 50% is targeted for the Vaughan Metropolitan Centre and the Regional Intensification Corridors by 2031. A 40% transit modal split during peak periods is targeted for all other Intensification Areas by 2031 (4.1.1.2);
- That the street network will be the basis for enhanced transportation opportunities, including transit, walking, cycling, and place making initiatives. Existing rights-of way should be designed to optimize the efficient movement for a variety of modes, potentially resulting in reduced capacity for cars where overall capacity increases can be achieved (4.1.1.5);
- To support the development of a comprehensive network of on-street and off-street pedestrian and bicycle routes, through the implementation of the City’s Pedestrian and Cycling Master Plan and York Region’s Pedestrian and Cycling Master Plan, to facilitate walking and cycling and to promote convenience and connectivity (4.1.1.6); and

- To plan for a street network that prioritizes safe and efficient pedestrian travel while effectively accommodating cyclists, transit and other vehicles, and to create more pedestrian and transit-friendly street cross-sections (4.2.1.2).

Consistent with the York Region OP, the City of Vaughan OP sets specific transit mode share targets (shown in **Table 2-2**). The sections of Centre Street and Bathurst Street designated as a Regional Intensification Corridors have a 50% transit mode share target in the peak periods by 2031. Achieving this targets is dependent upon the implementation of land use intensification along these corridors, urban design, rapid transit infrastructure and service, active transportation infrastructure and programs, and transportation demand management (TDM) measures.

Table 2-2: 2031 Transit Mode Share Targets (Peak Periods)

| Areas | 2031 Transit Mode Share Targets during Peak Periods |
|--------------------------------------|---|
| Vaughan Metropolitan Centre | 50% |
| Regional Intensification Corridors * | 50% |
| Other Intensification Areas ** | 40% |
| City of Vaughan Overall | 30% |

Source: City of Vaughan Official Plan 2010 – Volume 1- 2017 Office Consolidation, policies, 2017

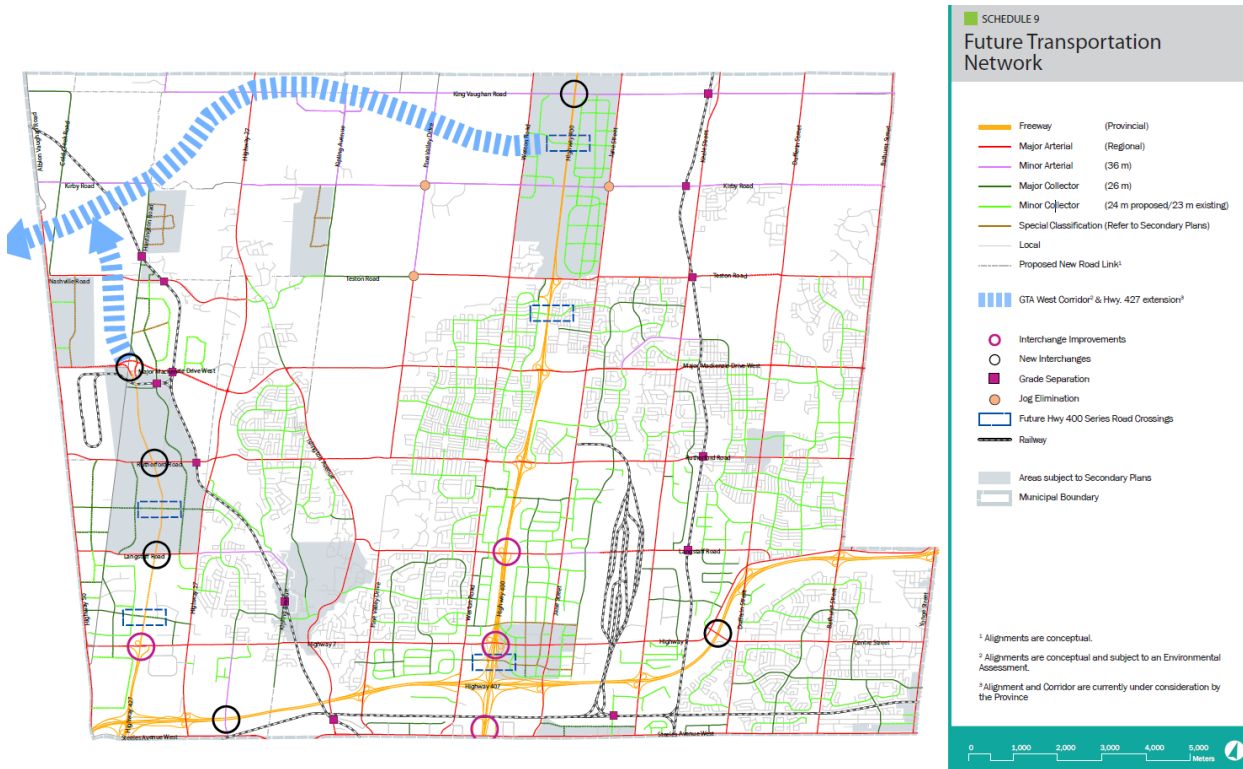
* Centre Street and Bathurst Street are Regional Intensification Corridors

** PCSP area is a Primary Centre that is connected by two Regional Intensification Corridors: Centre Street and Bathurst Street.

Schedule 9 (**Figure 2-8**) identifies the City's Future Transportation Network. Within the Promenade Centre study area, Centre Street and Bathurst Street are identified as Arterials (Regional Standard). New Westminster Drive, Atkinson Avenue and Clark Avenue are designated as Major Collectors (26m). Beverly Glen Boulevard and Brownridge Drive are designated Minor Collectors (24m proposed/23m existing).

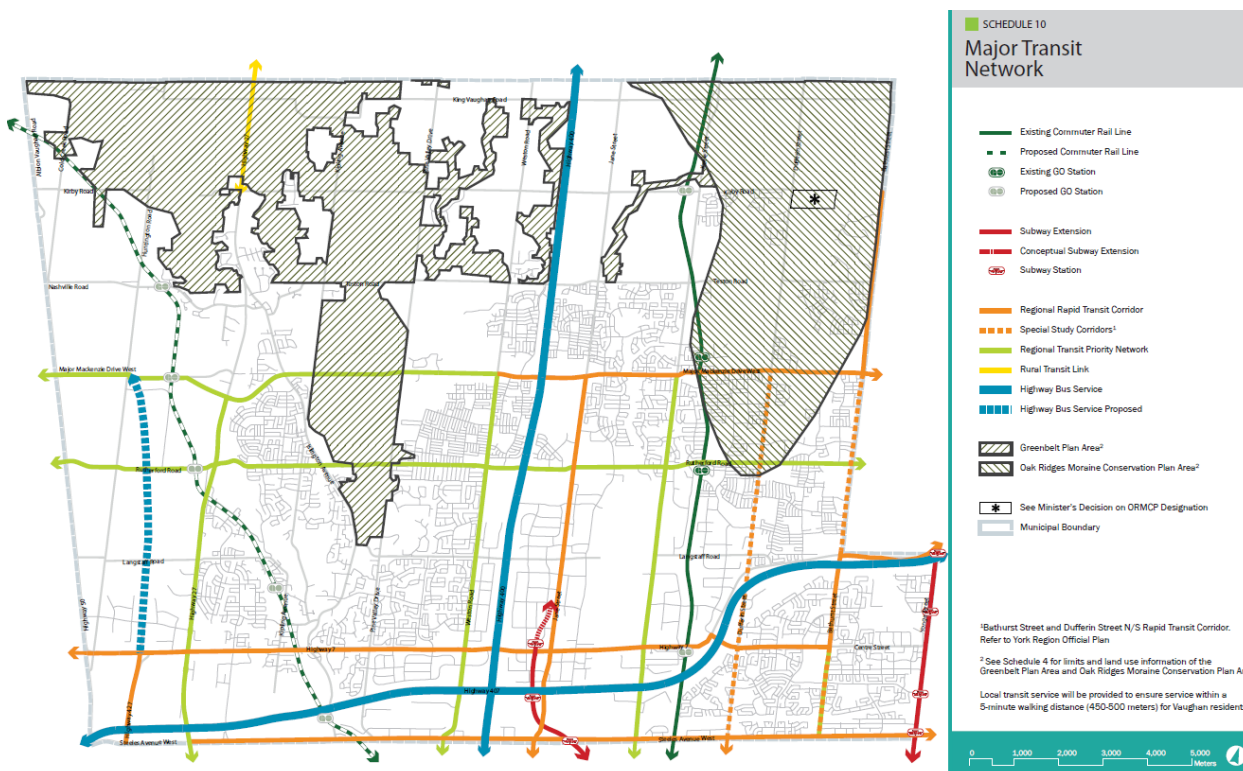
Schedule 10 (**Figure 2-9**) identifies the future Major Transit Network, and is largely consistent with the designation of corridors in Regional plans. It is noted that these schedules were developed prior to the completion of the 2016 York Region TMP, and as such incorporate Regional plans based upon the previous version of the York Region TMP.

Figure 2-8: City of Vaughan Official Plan, Schedule 9, Future Transportation Network



Source: City of Vaughan Official Plan 2010 – Volume 1- 2017 Office Consolidation, Schedules, 2017

Figure 2-9. City of Vaughan Official Plan, Schedule 10, Vaughan Major Transit Network



Source: City of Vaughan Official Plan – Volume 1- 2017 Office Consolidation, Schedules, 2017

Under the implementation section of the plan (section 10) Secondary Plans will address the transportation network, including provisions for local transit, walking and cycling as well as connections to City-wide networks. As a key development area, the Promenade Centre Secondary Plan shall include:

- The establishment, implementation, and/or continuation of a fine grain street grid that incorporates sidewalks and bike lanes; and
- A mobility plan that delivering a weather-protected system of pedestrian and cycling paths and facilities.

2.4.2 Green Directions Vaughan (2009)

Green Directions is the City's sustainability and environmental master plan. Transportation is a key component of the plan. Goal 3 focuses specifically on how people get around, aiming to improve transportation transit and active transportation choices that reduce automobile dependency, traffic congestion, and transportation related GHG emissions. The following objectives support the sustainable transportation goal:

- 3.1 Developing and sustaining a network of sidewalks, paths and trails that supports all modes of non-vehicular transportation;
- 3.2 Developing and sustaining a network of roads that supports efficient and accessible public and private transit;
- 3.3 Reducing single occupant vehicle (SOV) trips by supporting active transportation, car-pooling and public transit;

2.4.3 Vaughan Transportation Master Plan – A New Path (2012)

The City of Vaughan's 2013 Transportation Master Plan (TMP) evaluates the city-wide transportation needs and identifies policies, infrastructure and services needed to efficiently accommodate population and employment growth to 2031, guided by the vision of "Reducing automobile dependence and moving the City closer to achieving the goal of a more livable, sustainable community".

The principles and goals of the Vaughan TMP promote a balanced approach to transportation that:

- Offers safe, accessible, affordable, reliable, and efficient transportation for everyone;
- Minimizes environmental impact;
- Integrates land use and transportation planning;
- Promotes economic vitality;
- Avoids unnecessary capacity improvements;
- Supports active transportation and reduces single-occupant vehicle travel; and
- Reduces the need to travel.

As such, the Vaughan TMP adopts a "Transit First" focus and recommends that road network improvements be largely limited to strategic initiatives that support transit and

goods movement, improve network connectivity, or support intensification in designated areas. Road improvements that could compete with transit are recommended to be deferred until enhanced transit services are operating and have an established ridership base. Road improvements to address future capacity deficiencies that cannot be addressed by TDM (including HOV) initiatives and enhanced transit should be identified when a corridor is forecast to exceed its practical capacity (i.e. Level of Service “E”).

Based upon the objectives and policies described previously, the Vaughan TMP recommends an ultimate 2031 transportation network along with short (2011-2016), medium (2016-2021) and long (2021-2031) term action plans for active transportation, transit support initiatives, travel demand management, parking, strategic road initiatives, and monitoring.

Promenade Centre is recognized as a regionally significant shopping centre, which has the potential for residential intensification and the introduction of additional uses through the redevelopment of existing buildings, surface parking, or out-parcels. Recommended actions that relate to the PSMP study area include: improving access to bus and VIVA Stations, including analyzing pedestrian and cycling issues/needs

An update to the TMP is underway.

2.4.4 Vaughan Transportation Master Plan Update (ongoing)

An update to the TMP started in the summer of 2019 and is expected to be completed by early 2021. The TMP update will look to the 2041 horizon. The plan departs from the previous TMP by including policies and direction for complete streets, future mobility and goods movement.

2.4.5 Vaughan Pedestrian and Bicycle Master Plan (2007 and 2019)

The City of Vaughan adopted the Pedestrian and Bicycle Master Plan in January of 2007. In the last ten years, there has been a steady increase in societal and governmental interest, support and understanding of cycling and walking as a viable and healthy mode of transportation. As such there has been significant advancement in strategies, policies, legislation and guidelines for the planning, design, implementation, education and operation of safer active transportation networks.

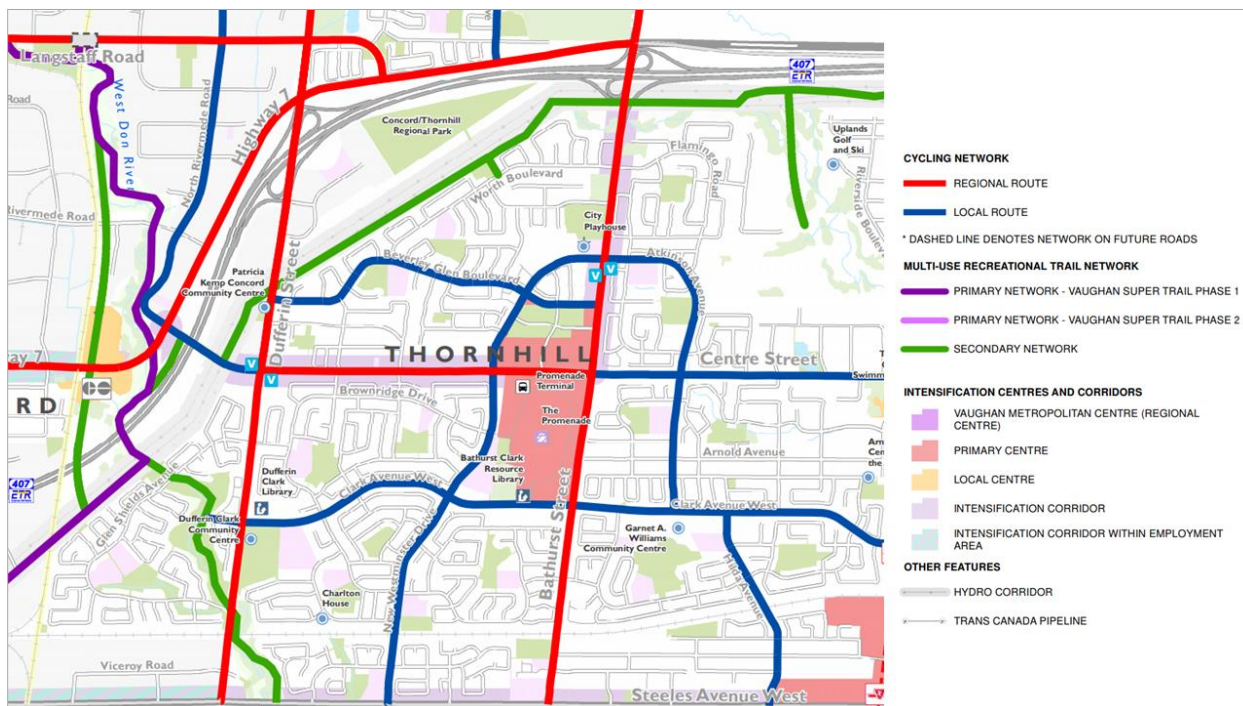
The intent of the updated Pedestrian and Bicycle Master Plan update was to be evolutionary, building on the original plan creating a path forward that is flexible, shorter-term and focused on the needs of the community. It reflects lessons learned from the last 10 years and current state of practice. The Plan formalizes the on-going progress the City has made in making our community more bikeable and walkable.

The City of Vaughan is currently carrying out an update to the Pedestrian and Bicycle Master Plan. The updated plan identifies the need to provide physically separated cycling facilities on all arterial and major/minor collector roadways. Implementation will occur through routine accommodation as part of new development and comprehensive capital projects.

A Draft Priority Cycling and Multi-use Recreational Trail Network map (**Figure 2-10**) was developed based on current travel patterns and will be used to guide the City in prioritizing network gaps not addressed through routine accommodation. The map highlights three

existing neighbourhoods that warranted prioritization leading to the identification of three localized mini networks, one within the Thornhill community. The Draft Priority Cycling and Multi-use Recreational Trail Network map highlights priority routes within the Thornhill community that are designed to service the highest proportion of potential cycling trips using existing travel patterns. These routes will contain the highest quality facilities that provide a safer, more comfortable and attractive user experience.

Figure 2-10: Draft Pedestrian and Bicycle Master Plan Cycling Network as it relates to the Study Area



Source: City of Vaughan Draft Pedestrian and Bicycle Master Plan, 2018

In a May 2018 Pedestrian and Bicycle Master Plan Update Progress Report & Ontario Municipal Commuter Cycling Program (OMCC) Funding update, Clark Avenue has been selected for advancement using OMCC program funding in advance of the finalization of the updated Plan for the following reasons:

- Thornhill has been identified as one of the primary locations for developing localized networks in the Pedestrian and Bicycle Master Plan Update and currently exhibits some of the highest internal trip levels that can be undertaken by bike
- There are several existing destination points including community centres, schools, places of worship, etc within the Clark Avenue corridor
- Provides connection between the existing Bartley Smith Greenway Trail system and the Dufferin Street Bike Lanes to the future Yonge Street separated facilities and rapid transit
- Will complement the planned Frequent Transit Network curbside service planned for Clark Avenue as part of the YRT/Viva Rapid Transit Network expansion project creating a “complete street”

- Opportunity to coordinate the implementation of the cycling facilities with the upcoming watermain replacement and road resurfacing project along Clark Avenue
- Was approved as an eligible project by the Ministry of Transportation for the OMCC Program

The project must be delivered by December 30, 2020 as per the Transfer Payment Agreement (TPA).

The City carried out the Clark Avenue Feasibility Study in 2018 to understand the implementation of a cycling facility. Details can be found in **Section 2.4.9**.

2.4.6 Active Together Master Plan (2018)

The ATMP identifies current needs and future facility provision strategies, consistent with the City's commitment to providing safe, accessible, and community-responsive parks and facilities that appeal to a wide range of interests and abilities. Recommendations from the plan include:

- Ensuring that parks and playgrounds are a five minute walk from residential areas (measured by a 500 metre radius from the park centroid). Regional parks are excluded from this measure.
- Seeking opportunities to establish trail loops for walking and running within new and redeveloped parks and open spaces (see page 76).

2.4.7 Transportation Impact Study Guidelines (2018)

In an attempt to streamline the approval process, the City's Transportation Engineering Division has prepared a set of Transportation Impact Study (TIS) guidelines which form the framework for all transportation impact studies submitted to the City for review. A TIS is required when one or more of the following criteria are anticipated:

- If the development/redevelopment will add 100+ trips during the peak hour to the surrounding network;
- If the site has the potential to generate 5% increase in traffic volumes on the Vaughan road network or on critical intersection turning movements, resulting in unacceptable or adverse operational and safety impacts;
- If the proposed site is located in a congested area;
- If the proposed development or redevelopment is not envisioned by existing plans or requires a change or exception to existing plans.

A TIS is typically required during the following development stages: zoning or rezoning applications, land subdivision applications, site plan approval, secondary plans or block plans, or amendments to the Official Plan. Generally, a TIS has a shelf life of approximately three years.

For the evaluation of site traffic impacts, the Guidelines requires to identify signalized intersections where:

- V/C ratios for overall intersection operations, through movements, or shared through/turning movements increase to 0.9 or above.

- V/C ratios for exclusive movements increase to 0.95 or above.
- Queues for an individual movement are projected to exceed available turning lane storage.

Unsignalized intersections where:

- Levels of service (LOS), based on average delay per vehicle, on individual movements exceed LOS E.
- The estimated 95th percentile queue length for an individual movement exceeds the lesser of 5 vehicles or the available queue storage.

2.4.8 Parking Requirements

The Vaughan City-wide Comprehensive Zoning By-Law Requirements (2010) outlines parking space, barrier-free parking space, bicycle parking space and loading space requirements (Section 6.0) for various residential, commercial, and mixed use zones. Parking minimums are defined for all zones. Parking maximums are defined for some zones, mainly those that are medium and higher density in nature.

The City is currently undertaking a City-wide comprehensive review of its Zoning By-Law that aims to create a progressive By-law with updated, contemporary uses and standards. This study is expected to complete by the end of 2019.

2.4.9 Clark Avenue Feasibility Study (2018)

A feasibility study carried out to understand the implementation of a cycling facility along Clark Avenue West, from Jason Street to Yonge Street. The study suggested that the preferred cycling facility for the section of Clark Avenue from Jason Street to Yonge Street would be an in-boulevard cycle track adjacent to the sidewalk, with further confirmation to be determined through the Detailed Design process.

Additional recommendations include fostering a better pedestrian and cycling environment, and that measures to reduce the operating speeds of vehicle traveling along Clark Avenue also be implemented. Speed data indicates that at the 85th percentile, vehicles are traveling around 17 km/hr over the posted speed limit of 50 km/hr.

In 2019, the City commenced the detail design for the Clark Avenue Cycle Tracks and Road Rehabilitation and confirmed a curb side raised and separated cycle track as the preferred facility type for a number of reasons including consistency with the facilities being implemented on Centre Street and Bathurst Street as part of the VivaNext project.

2.4.10 Thornhill Town Centre – Official Plan Area Specific Policies (2019 City of Vaughan OP Consolidation)

The area specific policies for the area around Bathurst and Centre Streets include intensification of existing lands supported by a network of public roads, as shown in **Figure 2-11**.

The road network includes a collector road ('Main Street'), as shown in blue on the map. 'Main Street' is required as part of the first stage of the first phase of development of the lands designated as Mid-Rise Mixed-Use and High-Rise Mixed Use. The remaining network

is conceptual in nature, with the final locations of roads and intersections to be determined through the development approval process, but it is a requirement of this Secondary Plan that all roads shall be built.

Figure 2-11. Bathurst and Centre Street Land Use and Transportation Network



Source: City of Vaughan Official Plan – Volume 2 – 2019 Office Consolidation

The following Region of York road and transit improvements have been identified as necessary to support the full redevelopment of the Thornhill Town Centre:

- Bathurst Street to be widened from four lanes to six lanes from north of Steeles Avenue to Highway 407 in the 2011 to 2021 time period, or sooner if warranted based on monitoring of local traffic conditions (status: unwidened).
- Implementation of the York Rapid Transit Plan with both phases of the planned, upgraded transit in place to serve the Thornhill community by 2015 (status: Phase 1, from Edgeley Boulevard (VMC) to Bowed Road complete, Phase 2 (Bowes Road to Richmond Hill) to be completed in late 2019);
- Traffic signal controls installed at the Bathurst/Beverley Glen intersection (status: installed);
- Streetscaping improvements to Bathurst Street and Centre Street (status: on-going as part of the vivaNEXT project);
- A local transit network and associated transit infrastructure focused on the transit station at Centre Street and North Promenade; and,
- Transit links to the Highway 407 Transitway, Yonge Subway, Spadina Subway, Vaughan Metropolitan Centre and York University, and the GO rail commuter system;

The following City of Vaughan road and transit improvements have been identified as necessary to support the full achievement of the development of the Thornhill Town Centre:

- The collector and local road and laneway network (status: ongoing);
- The provision of a major collector road or minor arterial roadway (the “Main Street” identified on Map 12.11.B), built to public road standards, from Centre Street to Beverley Glen Boulevard. This roadway should provide suitable pedestrian amenities to promote pedestrian travel between adjacent residential and commercial areas (status: unbuilt);
- On-street and lay-by parking on all public roads within Thornhill Town Centre, in particular on both sides of the “Main Street” (status: on-street parking currently allowed along Disera Drive between Centre Street and Park Road); and,
- A pedestrian and bicycle system linking to areas in the rest of the Thornhill Community (status: ongoing. Includes the active transportation network as recommended in the City’s Draft Pedestrian and Bicycle Master Plan including the Clark Avenue cycle track and the bike facilities on Centre Street and Bathurst Street constructed through the vivaNext construction)

2.4.11 Green Directions Vaughan (2009 and 2019)

Green Directions Vaughan was first approved by Council in 2009 and is the City's Community Sustainability Plan. A new 2019 draft plan is currently available for public review. This plan describes the City's environmental and sustainable priorities and outlines a new set of sustainability actions that will guide the City of Vaughan to help achieve a healthy natural environment, vibrant communities and a strong economy. It influences all aspects of the City's operational and regulatory activities including the growth management

strategy. The plan contains a number of actions informed by six goals. Key actions which will be considered by the Promenade Centre study are summarized in **Table 2-3**.

Table 2-3: Key Actions from Green Directions Vaughan 2019 Draft Plan

| Goal | Objective | Sustainability Action (Transportation and Mobility) |
|--|--|--|
| 1: To significantly reduce waste and the use of our natural resources | 1.1: To reduce greenhouse gas emissions and move towards carbon neutrality for the City of Vaughan's facilities and infrastructure | 1.14: Implement an electric vehicle (EV) charging policy for City facilities and encourage infrastructure throughout the City to support EVs, alternative fuel vehicles and low-carbon mobility. |
| | 1.2 To promote the reduction of community greenhouse gas emissions in the City of Vaughan. | 1.2.2 Examine the feasibility of requiring Community Energy Plans for all major developments and redevelopment projects, including Secondary Plans, Block Plans and applications for significant development (as defined in the VOP 2010). |
| 2: To ensure sustainable development and redevelopment | 2.3 To create a city with sustainable built form that is compact, resilient and designed to promote citizen health. | 2.3.1 Implement the Sustainability Metrics as a component of the development review process to measure incremental sustainability improvements with each development application. |
| 3: To ensure that the City is easy to get around with a low environmental impact | 3.1 To develop and sustain a network of sidewalks, paths and trails that supports all modes of non-vehicular transportation. | 3.1.2 Plan and implement a complete streets framework and guidelines to create a safe and attractive environment for all modes of transportation. |
| | | 3.1.4 Plan and implement a recreational trail network in proximity to residential communities that is accessible, desirable, safe, and which promotes outdoor active lifestyles for current and future populations. |
| | 3.2 To develop and sustain a network of roads that supports efficient and accessible public and private transit. | 3.2.1 Develop a framework for first-mile, last-mile initiatives to promote transit use. |
| 3.2.2 Implement a fine grain network of streets and block lengths to allow pedestrians, cyclists, transit vehicles, automobiles and goods and services vehicles to move efficiently, in accordance with City Official Plan and Master Plans. | | |
| 3.3 Reduce single occupant vehicle (SOV) trips by supporting active transportation, carpooling and public transit. | 3.3.2 Collaborate with York Region and seek community partners to implement transportation demand management initiatives to reduce traffic congestion and promote transit and active transportation. | |

2.5 Draft Vaughan Geometric Design Standards (2013)

The 2013 edition of the Standard Drawings was prepared in response to the planned growth envisioned by the City's Official Plan and informed by the Vaughan Transportation Master Plan. The Drawings are currently in draft form pending review from internal and external agencies (e.g. utilities). The standard drawings for streets are based around the traditional

road classification system. Key information from each street type is summarized below in **Table 2-4**.

Table 2-4. City of Vaughan Draft Standard Drawings 2013

| Class | ROW (m) | Motor Vehicle Lanes | Lane Width (m) | Active Transportation | Notes |
|------------------------------------|---------|------------------------------------|---------------------------------|--|---|
| Major Collector | 26 | 4 through or 2 through & 2 parking | 3.5 (all) | 1.5m sidewalk or 3m active transportation facility on both sides | Street trees and amenity zone provided on both sides of street. |
| Minor Collector (with lay-by lane) | 24 | 2 through & 1 parking | 3.75 (through) 2.5 (parking) | 1.5 m sidewalk on both sides & 1.5 m painted bike lanes | Street trees and amenity zone provided on both sides of street. Parking lane is raised |
| Minor Collector (w/o lay-by lane) | 24 | 2 through | 3.75 | 1.5 m sidewalk on both sides & 1.5 m painted bike lanes | Street trees and substantial amenity zone provided on both sides of street. |
| Local | 17.5 | 2 through & 1 parking | 8 (pavement width) | 1.5 m sidewalk on one side | Street trees provided on both sides of street. Amenity zone provided between sidewalk and road. |

The Draft Standards also provide guidance on curb radii, as shown in **Table 2-5**.

Table 2-5: Draft Engineering Design Criteria & Standard Drawings (2013) - Curb Radii

| INTERSECTION OF | SIGHT TRIANGLES | CURB RADII R | TAPER T1 | TAPER T2 | D* |
|--------------------------------|-----------------|--------------|----------|----------|----|
| ARTERIAL AND MAJOR** | 15 | 15 | 1.5 | 2.5 | 15 |
| ARTERIAL AND MINOR** | 15 | 15 | 1.0 | 2.5 | 15 |
| MAJOR AND MAJOR | 12 | 15 | 1.5 | 1.5 | 18 |
| MAJOR AND MINOR | 10 | 15 | 1.5 | 1.0 | 15 |
| MAJOR AND LOCAL | 8 | 12 | 1.0 | 0 | 6 |
| MINOR AND MINOR | 8 | 12 | 1.0 | 1.0 | 6 |
| MINOR AND LOCAL | 5 | 9 | 1.0 | 0 | 6 |
| MINOR AND BUFFER | 5 | 9 | 1.0 | 0 | 6 |
| MINOR AND LANEWAY | 3 | 9 | 0 | 0 | 6 |
| LOCAL AND LOCAL/BUFFER/LANEWAY | 3 | 9 | 0 | 0 | 3 |
| BUFFER AND BUFFER/LANEWAY | 3 | 9 | 0 | 0 | 3 |

MAJOR = MAJOR COLLECTOR; MINOR = MINOR COLLECTOR

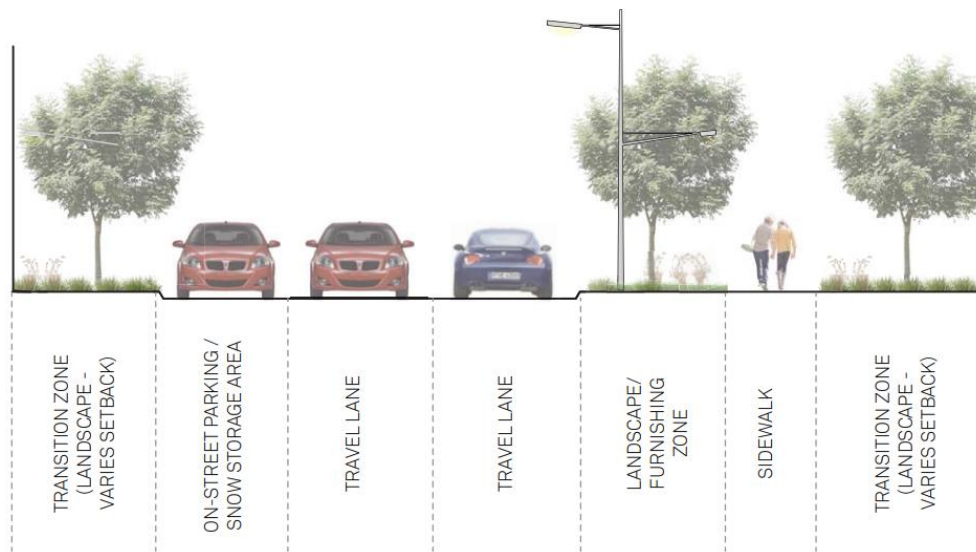
2.5.1 Vaughan City-wide Urban Design Guidelines (2018)

While the Urban Design Guidelines primarily focus on buildings, there are streetscape and public realm elements for intensification areas such as Promenade Centre. In Intensification Areas the City-Wide Streetscape Implementation Manual should be referred to for

boulevard details and level of service requirements to complement the building and site design guidance contained in the Urban Design Guidelines. The Streetscape Manual is discussed in the next section.

The Guidelines outline a “Green Vaughan Approach” or “Green Approach”, which recommends a landscape buffers between built form elements, such as between buildings and the street, and between sidewalks and the street. This landscape zone will not only improve the esthetics of the street, but improve the comfort and safety for pedestrians. An example is provided in **Figure 2-12**.

Figure 2-12: Example of Landscaped Zones



Private local roads should be designed to provide landscaped zones, a sidewalk on one side of the road, and on-street parking.

Source: Vaughan City-wide Urban Design Guidelines, 2018

2.5.2 Vaughan City-wide Streetscape Implementation Manual (2014)

The Streetscape Implementation Manual and Financial Strategy for intensification areas and heritage conservation districts recognizes that the character, function and appearance of streets play an important role in the overall quality and livability of the city and is applicable to intensification areas and corridors as designated in the Official Plan. The Manual draws on a Complete Streets framework, and recognizes the role complete streets play in supporting growth and economic development.

Design Strategy

The manual emphasizes context sensitive design based on three streetscape structuring elements: road classification, streetscape type and level of service. The intent of the design strategy is to provide a common framework for a common streetscape language, and a process to ensure that future intensified urban streetscapes are designed to a common standard in Vaughan.

Table 2-6: Design Strategy Summary

| Streetscape Structure Element | Description |
|-------------------------------|---|
| Road Classification | <p>Arterials</p> <ul style="list-style-type: none"> • Major (typically 45 m ROW) • Minor (typically 33 to 36 m ROW) <p>Collectors</p> <ul style="list-style-type: none"> • Special (typically 33 m ROW) • Major (typically 26 to 33 m ROW) • Minor (typically 23 to 26 m ROW) <p>Local Streets (typically 17.5 to 22 m ROW)</p> <p>Mews (typically 15 to 17 m ROW)</p> |
| Streetscape Type | <ul style="list-style-type: none"> • Mixed Use Commercial • Transit Intensification Corridor • Technology / Office • Neighbourhood |
| Level of Service | <ul style="list-style-type: none"> • Basic Level of Service • Standard Urban Level of Service • Enhanced Level of Service • Premium Level of Service |

Design Elements and Standards

Based on the road classification, streetscape type and level of service, the manual describes design components (such as pavers, street furniture, plantings...etc.) and provides a design components matrix for Urban Intensification Areas. The Manual also provides standards related to paving, illumination, planting, furnishings, medians, intersections depending on the desired Level of Service.

2.6 Emerging and Proposed Development

2.6.1 Promenade Mall Phase 1 Redevelopment Proposal (2018)

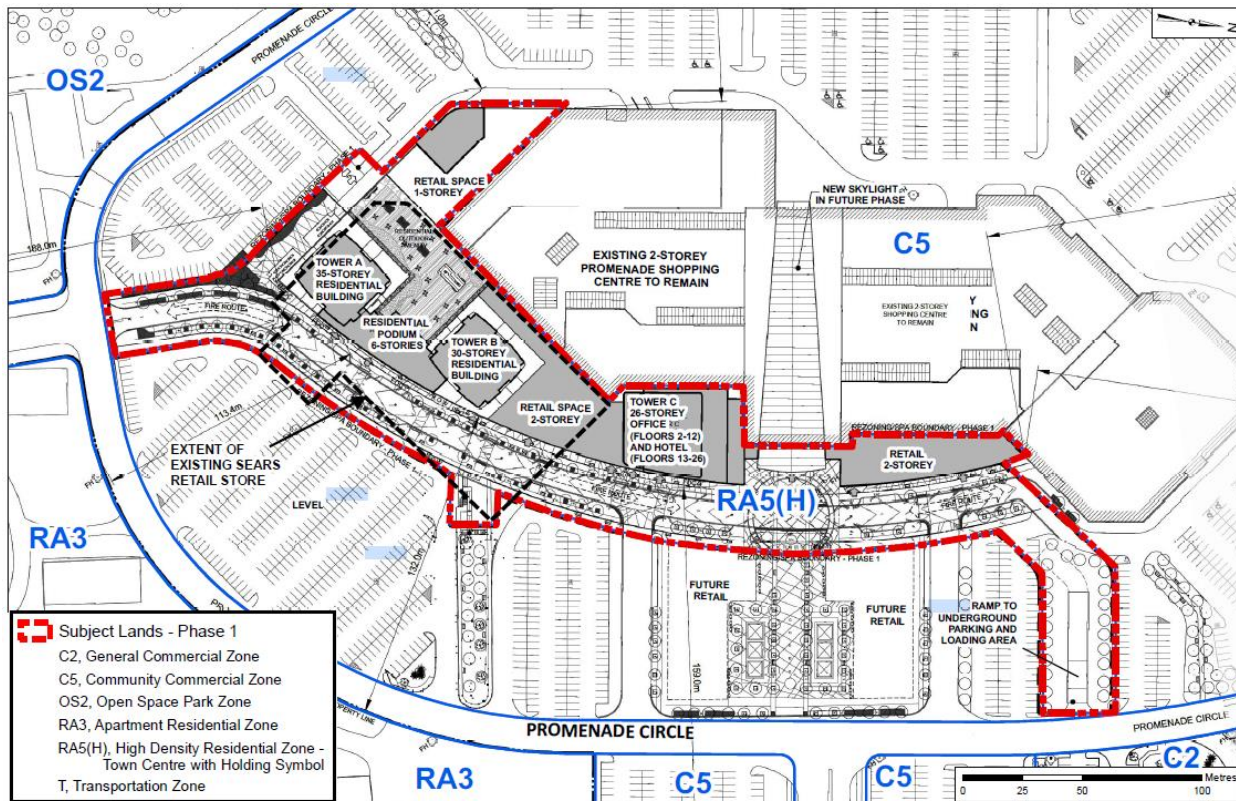
Located in the southeast corner of Promenade Centre, near the intersection of Clark Avenue and Bathurst Street, Phase 1 involves the redevelopment of a portion of the Promenade Centre site as a mixed-use retail, office, hotel, and residential condominium Project. The redevelopment consists of three towers ranging in height from 28 storeys to 35 storeys; three will be primarily residential with retail located at-grade and one will be split between office floor space and a hotel.

The site location and redevelopment area are illustrated in **Figure 2-13**. The former Sears department store area will be modified and reduced in area. In this area, two residential towers (at 30 storeys and 35 storeys; these two buildings are referred to herein as “Tower A” and “Tower B” respectively) would be connected by a six-storey podium which will feature retail space at-grade. “Tower C” will be 28 storeys and will consist of 14 storeys of office space, beginning at-grade, and 14 storeys of hotel space, beginning at the 15th storey. “Tower C” will also feature retail space located at-grade, mixed with the office space at the ground level.

The redevelopment is served by the existing public and private road network surrounding the Promenade Shopping Centre. To provide better accommodations for pedestrians, cyclists and vehicular traffic including on-street layby parking, changes to connectivity

include the replacement and revitalization of the existing frontage road/driveway along the east side of the Shopping Centre with a new private road (“High Street”), as shown in **Figure 2-13**. Two new east-west private streets would connect the east side of Promenade Circle to the High Street.

Figure 2-13: Proposed High Street



The redevelopment also includes a Low Street (located below High Street) that will provide direct access for loading and connectivity to three levels of underground parking. Stratified separation of the two streets provides better site traffic circulation and separation between different road users including pedestrians, cyclists and larger service vehicles.

The Site will take access as it currently does, from five entry points from the surrounding arterial / major collector road network; these roads include North Promenade, East Promenade, South Promenade, West Promenade, and a right-in/right-out driveway from Bathurst Street between Centre Street and East Promenade. These streets will provide access to Promenade Circle, which will continue to serve as a “ring road” for the Site. The redevelopment maintain connectivity to the surrounding Regional and City road networks. Major full-movement connections with the mall’s ring road to the surrounding public streets are facilitated through signalized intersections, one each on the surrounding streets:

- Centre Street to the north
- Bathurst Street to the east
- Clark Avenue to the south and
- New Westminster Drive to the west

2.6.2 Promenade Mall Phase 1 Redevelopment Transportation and Mobility Impact Study (2018)

The Transportation and Mobility Impact Study reviewed traffic and multi-modal operations, parking, circulation and the Transportation Demand Management (TDM) Plan. Generally, the Study found that the Phase 1 can be accommodated by the local transportation network. Additionally, the study found that the Site Plan can accommodate the parking, loading, on-site circulation, and access needs associated with the redevelopment.

Traffic Operations

The Study found that all intersections operate acceptably under all future traffic conditions and that the proposed redevelopment can be reasonably accommodated from a traffic operations perspective.

The study noted that the intersection of Bathurst Street / Clark Avenue was identified as operating at busy, but acceptable levels of service under all future traffic conditions with an overall v/c ratio of 0.90 or less during the weekday and Saturday mid-day peak hours. It should be noted that the westbound left is a critical movement and operates with an individual v/c ratio approaching theoretical capacity in the weekday afternoon peak hour (v/c of 0.96). Similarly, the northbound and southbound through movements are operating with individual v/c ratios approaching theoretical capacity in the weekday afternoon peak hour.

Multi-Modal Travel Assessment

Using a multi-modal level of service (MMLOS) assessment, the study found that transit levels of service range from LOS A for Transit Headways and LOS B for Access to Transit, and LOS A to LOS C for Intersection Approach. Intersection approach is likely to improve to a LOS A with the implementation of a transitway. Transit service for the local transit routes that use Bathurst Street and Clark Avenue, will depend on specific route and may from time to time encounter some delay using the turning lanes within in the Bathurst Street / Clark Avenue signalized intersection.

The assessment found that cycling infrastructure reflects a LOS E to F because there are no existing or planning cycling facilities along the surrounding arterial, collections or local roads; however, During Phase 1, High Street will be designed with “Sharrows” within the private right-of-way. At the ultimate build out of the Master Plan, the Promenade Circle will be design with in-boulevard cycle tracks consistent with how Collector Streets in the City of Vaughan are now being designed and/or retrofitted. In addition, future connections will be added to the surrounding major roads (Centre Street, Bathurst Street, and Clark Avenue), which will also be outfitted with either on-street or in-boulevard cycling infrastructure in the future. Clark Avenue is discussed below, in **Section 2.6.3**.

Pedestrian connections will be served by minimum 2.0 metre sidewalks (meeting the municipal standard) and crossings at signalized and unsignalized intersections, meeting LOS A or LOS B conditions.

2.6.3 The Torgan Group (7700 Bathurst Street) Traffic Impact Study (2016)

A mixed use development by the Torgan Group is proposed northeast of Promenade Centre (7700 Bathurst Street). The site location is shown in Figure 2-14.

Figure 2-14: Torgan Development Site Location (7700 Bathurst Street)



Source: The Torgan Group 7700 Bathurst Street Traffic Impact Study (March 2016)

The proposed redevelopment includes seven 27 story towers with 1,800 residential units, 26,910 square feet of office, and 101,449 square feet of commercial ground floor area. Based on the proposed development, the traffic analysis found that:

- Bathurst Street and Centre Street is expected to operate over capacity by 2030, with a v/c ratio in excess of 1.0 due to background traffic unrelated to the development.
- Centre Street and Disera Drive intersection will continue to operate with acceptable v/c ratios (0.81) and delays (LOS C) during peak hours.
- Promenade Circle will experience marginal and incremental impacts to operations.

A 37% reduction in parking supply is proposed, with a total of new 2,400 spaces.

Proposed TDM measures include:

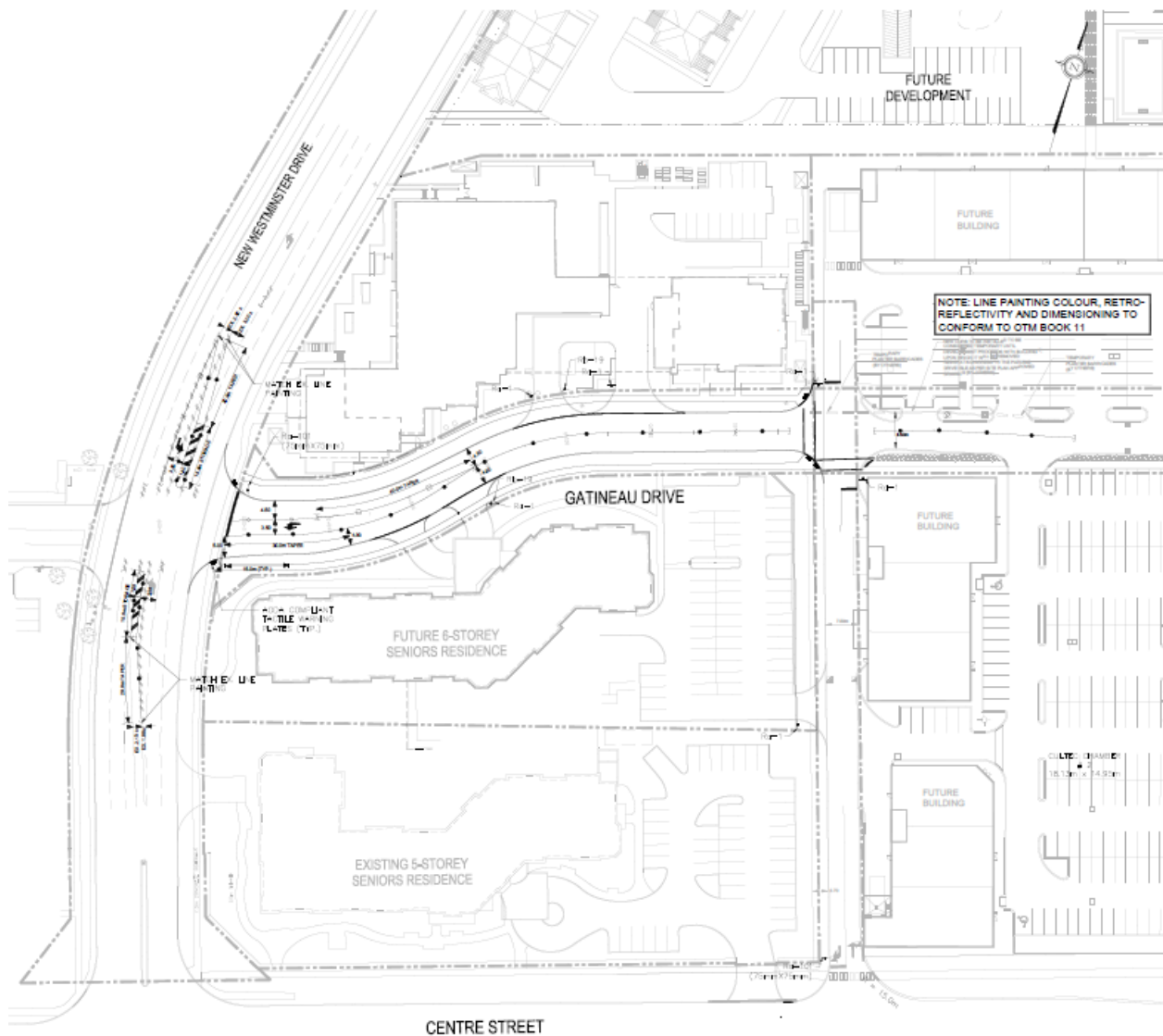
- Unbundled residential parking: separating the cost of parking from each residential unit

- Surface and underground bicycle parking
- Information distribution to residential owners and the condominium Board about travel options and active transportation networks
- Pre-loaded PRESTO cards to each residential unit

2.6.4 New Westminster Drive and Gatineau Drive Development (2013)

A development is proposed along the east side of New Westminster Drive, north of Centre Street and south of Katerina Drive, as shown in **Figure 2-15**. Access to the future 6-storey building has prompted the development of the east-west local road, as identified in the Vaughan Official Plan Thornhill Town Centre Area Specific Policies.

Figure 2-15: Pavement Marking Plan for the intersection of New Westminster Drive / Gatineau Drive

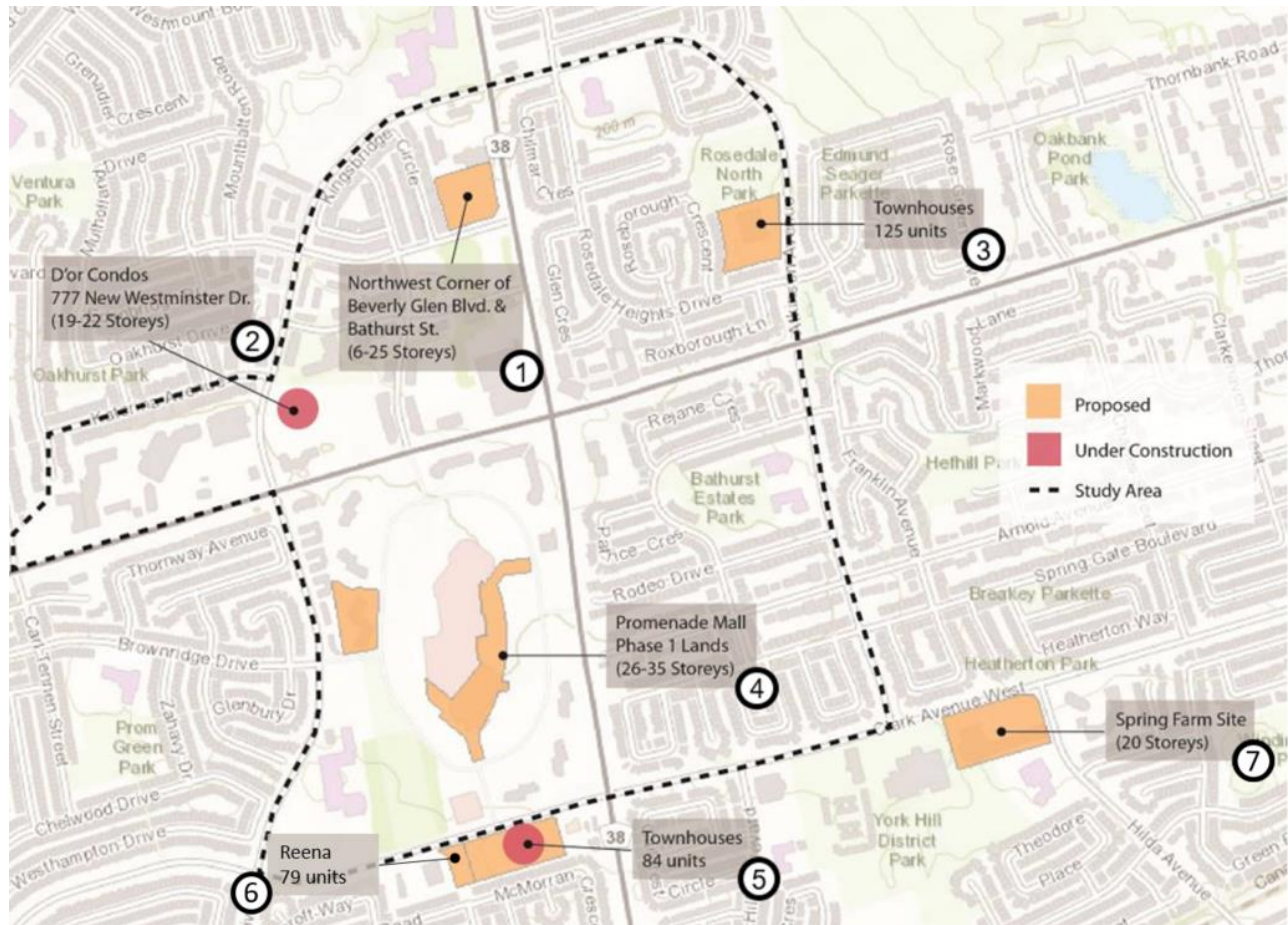


Source: Blue Water Ranch Developments Inc.

2.6.5 Other Development Applications

In addition to the developments proposed above, there are several projects either in the development application stage under construction or recently constructed. They are summarized in **Figure 2-16** with the status of the development shown in **Table 2-7**. While some of the proposed developments may or may not be approved, they are important considerations for evaluating current and future travel and connectivity in the area.

Figure 2-16. Summary of development in and around the study area



Source: City of Vaughan PLANit



Table 2-7: Summary of Development and Status

| ID | Address | Development Description | Status |
|----|---|-------------------------------|--------------------|
| 1 | Part of Lot 7, Con. 2, 65M-2700 (Northwest Corner of Beverly Glen Blv & Bathurst St) | Development of 4 buildings | Under Review |
| 2 | 777 New Westminster Dr | D'or Condos | Under Construction |
| 3 | 300 Atkinson Avenue | Townhouse Units | Under Review |
| 4 | 1 Promenade Circle | Promenade Phase 1 Development | Approved |
| 5 | South side of Clark Ave & Bathurst St | Townhouse Units | Public Hearing |
| 6 | 927 Clark Ave W | Reena – Facility Expansion* | Public Hearing |
| 7 | 441 Clark Ave West (Spring Farm Site) | Mixed use apartment tower | Under Review |

*To the west of the townhouse unit development at the southwest Corner of Clark Avenue W and Bathurst Street, the Reena Foundation has been acquiring additional lands to facilitate the expansion of their facility through the acquisition of the adjacent Mullen Drive road allowance from the City of Vaughan.

Discussions are underway to facilitate the sale of 0.1503 hectare (0.371 acre) of land located on the western portion of the subject property to Reena. Through discussions with Reena and City staff, these lands have been proposed to be provided to the Reena Foundation as part of the development of the subject property.

3 Existing Conditions

3.1 Land Use and Built Form

3.1.1 Land Use

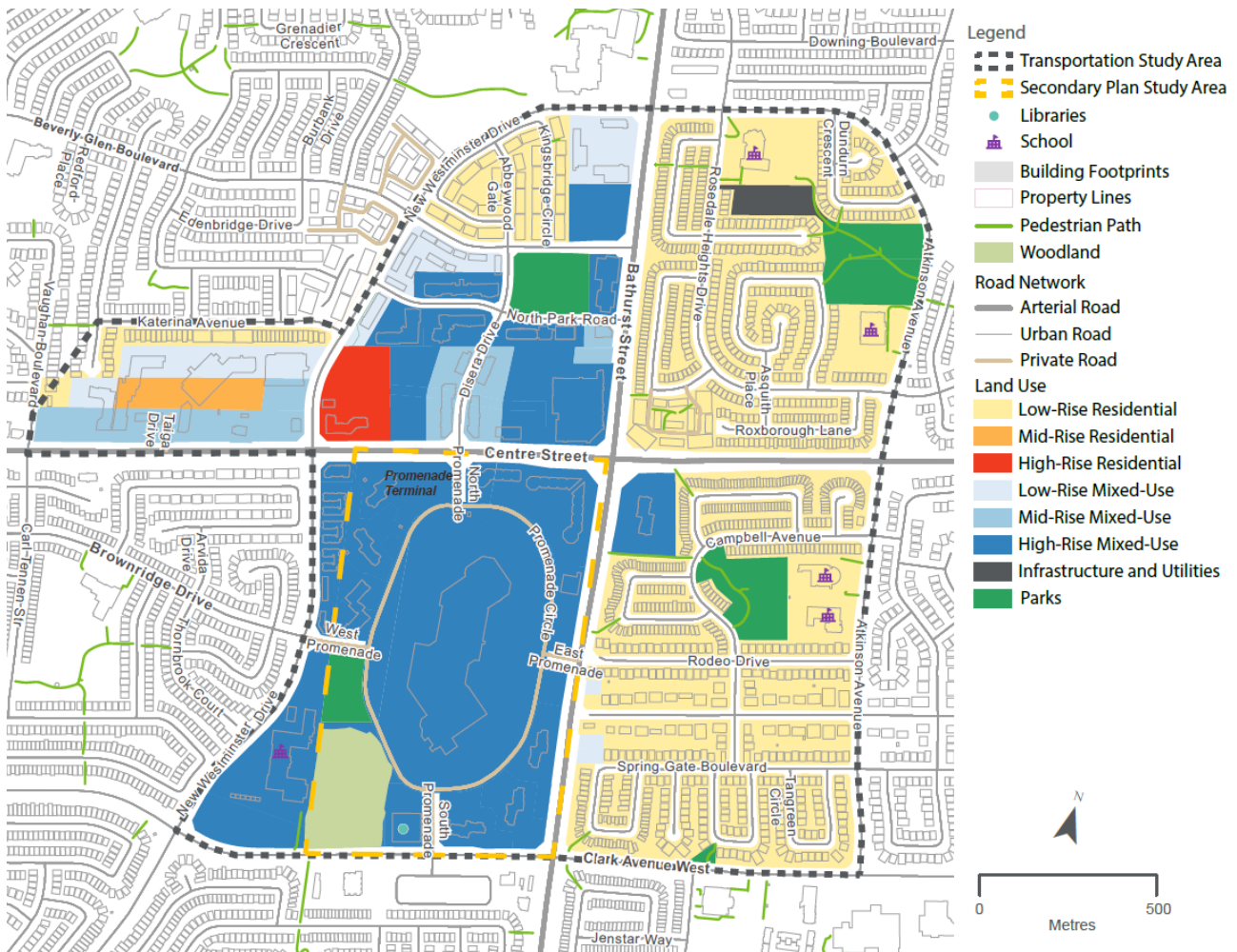
The Promenade Secondary Plan study area is primarily high-rise mixed use, including the Promenade Centre and other commercial use to the southwest of Centre Street and Bathurst Street. The Promenade Centre was opened in 1986. In 2017, the mall was purchased by Promenade General Partner Inc. from its original owner Cadillac Fairview. The mall has over 150 tenants and has a total retail floor area of 879,000 sq ft.¹ Major attractions to the mall include T & T Supermarket (Asian food grocery store), Imagine Cinemas, H&M, and Old Navy.² There are high-rise condominium buildings in the northwest and southeast corners of the SP study area, and townhouses along New Westminster Drive. St Elizabeth Catholic High School is located in the southwest corner of the SP study area next to Pierre Elliott Trudeau.

Outside of the SP study area, there are commercial activities along the north side of Centre Street west of Bathurst Street, and they are currently designated as high-rise residential, mid-rise mixed use, mid-rise residential, and low-rise mixed as shown in **Figure 3-1**. The rest of the study area is primarily low-rise residential and parks.

¹ Local Business Partners Acquire Promenade Shopping Centre, April 20, 2017
<https://www.newswire.ca/news-releases/local-business-partners-acquire-promenade-shopping-centre-619974933.html>

² Promenade Store Directory <https://www.promenade.ca/find-a-store/>

Figure 3-1: Study Area Land Use

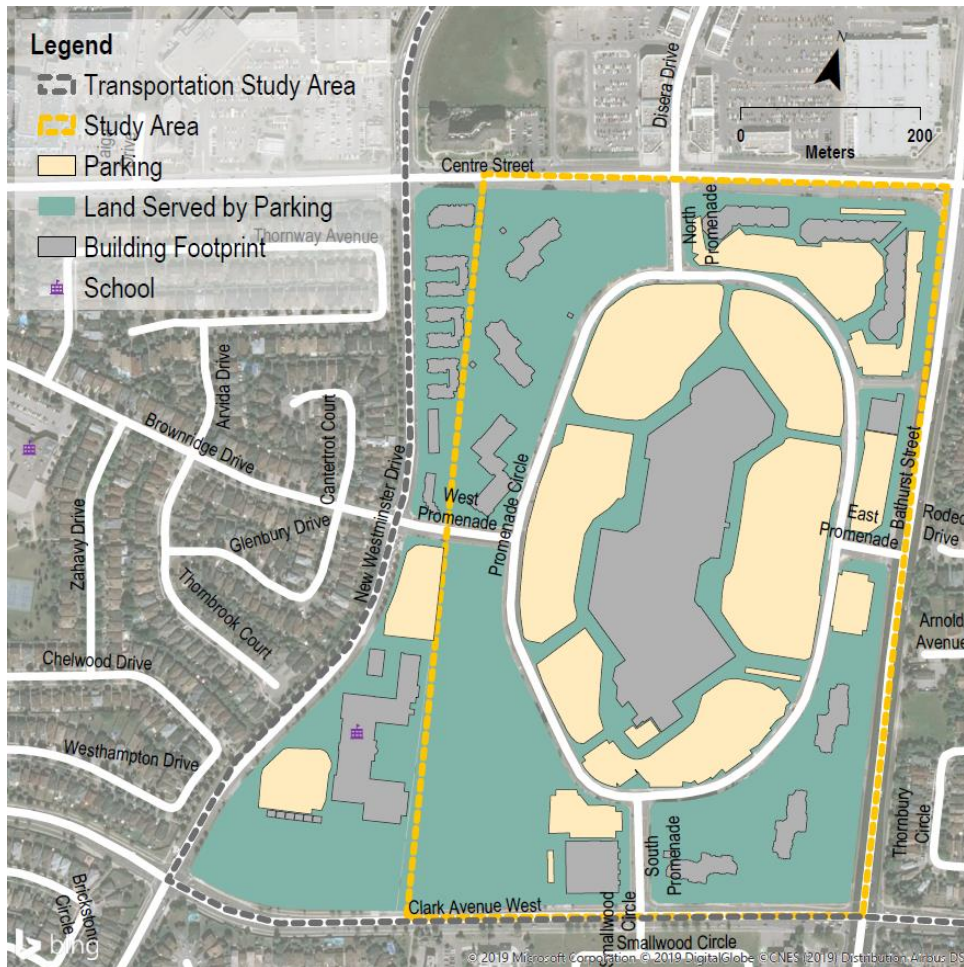


Source: City of Vaughan Official Plan (December 2018)

3.1.2 Surface Parking

The Promenade Secondary Plan study area is auto oriented, with vast surface parking lots available both in, and immediately west of the defined study area to the broader transportation study area boundary to New Westminster Drive as seen in **Figure 3-2**. Approximately 13 hectares of parking space is available to accommodate access to Promenade Centre and its surrounding areas. This is 34% of the total land bounded by Centre Street, New Westminster Drive, Clark Avenue West, and Bathurst Street, not including exclusive road right of way. Access to parking encourages automobile travel modes and present challenges to pedestrians trying to navigate and access the area as it is less safe and less comfortable.

Figure 3-2: Surface Parking



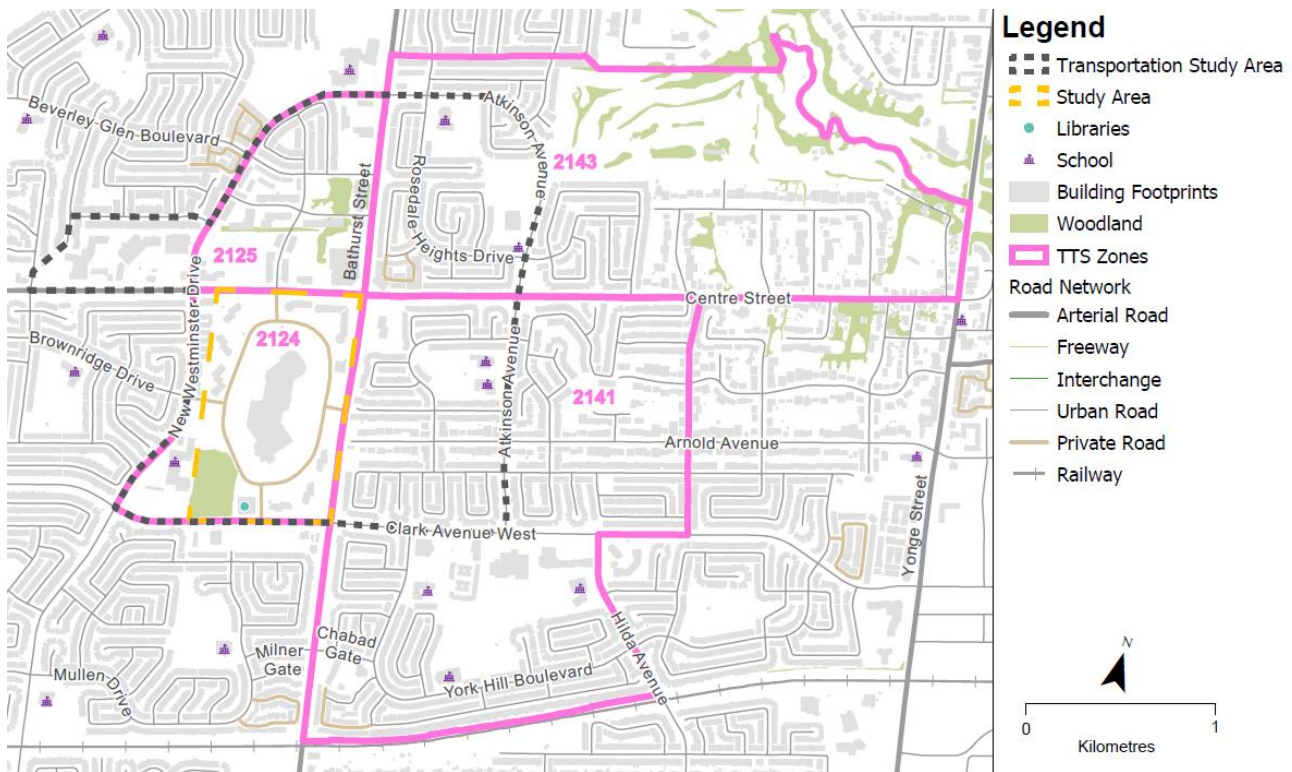
3.2 Travel Context

The 2016 Transportation for Tomorrow Survey is used to extract trip patterns such as trip origin-destination, mode share, and trip distance. It is noted that TTS tends to under-represent short distance trips, active trips, and trips that are not for work or school purposes.^{3 4} The study area falls within TTS zones 2121, 2125, 2143, and 2141. **Figure 3-3** shows the TTS zones relative to the study areas. TTS zone 2126 was not included due to its larger size relative to the size of the commercial area that is included as part of the transportation study area. The mix of land uses in this larger zone would not necessarily provide the desired information for the smaller component of the study area.

³ 2011 TTS Data Expansion and Validation Report, Data Management Group, *University of Toronto*

⁴ Effect of Land Use on Trip Underreporting in Montreal and Toronto's Regional Surveys, *Harding, Nasterska, Dianat, & Miller*. 2016. hEART 2016 – European Association for Research in Transportation

Figure 3-3: Identification of TTS Zones within the Study Area



3.2.1 Travel Demand Patterns

The number of trips to the study area by modes of travel is summarized in **Table 3-1** and illustrated in **Figure 3-4**. Approximately 39,000 trips go to study area in a day, and most trips are made by car, whether as the driver or passenger (84%). Only 6% of trips are made by transit, and 6% of trips are made by walking or cycling. An overwhelming majority of trips access the study area by car, indicating that potential demand for transit and walk/bicycle exists and should be examined in detail in the next phases this study (e.g., evaluating land use and transportation scenarios, recommending TDM measures).

The area attracts a high number of trips within from the surrounding neighbourhood, where 20% of all trips are internal (i.e., to and from TTS zone 2121, 2125, 2143, and 2141). When these trips are combined with trips from the rest of Vaughan (34%), they account for more than half of the trips to the study area, confirming that the study area serves as a major commercial centre for the City. The majority of these trips are made by car. Approximately 30% of trips are from the City of Toronto, and of these trips, the majority are made by car, and 16% of trips are made by transit.

“Other” travel mode includes school bus trips or other modes of transportation that is not transit, bicycle, auto driver or passenger, taxis, rideshares, and walking. It also includes individuals who responded with “unknown” to the TTS Survey. It is noted that there is a large number of trips in “Other” travel mode from to the rest of Vaughan due to a high number of school bus trips (1,116).

Table 3-1 Daily Number of Trips by Mode to Study Area

| Municipality | Auto Driver | Auto Passenger | Transit | Walk or Cycle | Other | Total | % of all Trips |
|---------------------------------------|---------------|----------------|--------------|---------------|--------------|---------------|----------------|
| Number of Trips by Trip Origin | | | | | | | |
| Promenade Centre | 1,012 | 194 | 11 | 374 | - | 1,591 | 4% |
| Rest of Transportation Study Area | 4,171 | 895 | 11 | 1,055 | 30 | 6,162 | 16% |
| Total Internal | 5,183 | 1,089 | 22 | 1,429 | 30 | 7,753 | 20% |
| Rest of Vaughan | 8,757 | 2,163 | 338 | 774 | 1,116 | 13,148 | 34% |
| Toronto | 7,637 | 1,930 | 1,884 | 113 | 80 | 11,644 | 30% |
| Markham | 1,868 | 370 | 115 | 17 | - | 2,370 | 6% |
| Richmond Hill | 2,053 | 364 | 95 | - | - | 2,512 | 6% |
| Rest of York Region | 424 | 47 | 43 | - | - | 514 | 1% |
| Rest of GTHA | 1,115 | 99 | 18 | - | - | 1,232 | 3% |
| Total | 27,037 | 6,062 | 2,515 | 2,333 | 1,226 | 39,173 | 100% |
| Mode Share by Trip Origin | | | | | | | |
| Promenade Centre | 64% | 12% | 1% | 24% | 0% | 100% | |
| Rest of Transportation Study Area | 68% | 15% | 0% | 17% | 0% | 100% | |
| Total Internal | 67% | 14% | 0% | 18% | 0% | 100% | |
| Rest of Vaughan | 67% | 16% | 3% | 6% | 8% | 100% | |
| Toronto | 66% | 17% | 16% | 1% | 1% | 100% | |
| Markham | 79% | 16% | 5% | 1% | 0% | 100% | |
| Richmond Hill | 82% | 14% | 4% | 0% | 0% | 100% | |
| Rest of York Region | 83% | 9% | 8% | 0% | 0% | 100% | |
| Rest of GTHA | 91% | 8% | 1% | 0% | 0% | 100% | |
| Total | 69% | 15% | 6% | 6% | 3% | 100% | |

Source: 2016 TTS

Trips extracted for 2006 TTS zone 2124, 2025, 2143, and 2141

Figure 3-4: Daily Number of Trips by Mode to Study Area



Source: 2016 TTS
Trips extracted for 2006 TTS zone 2124, 2025, 2143, and 2141

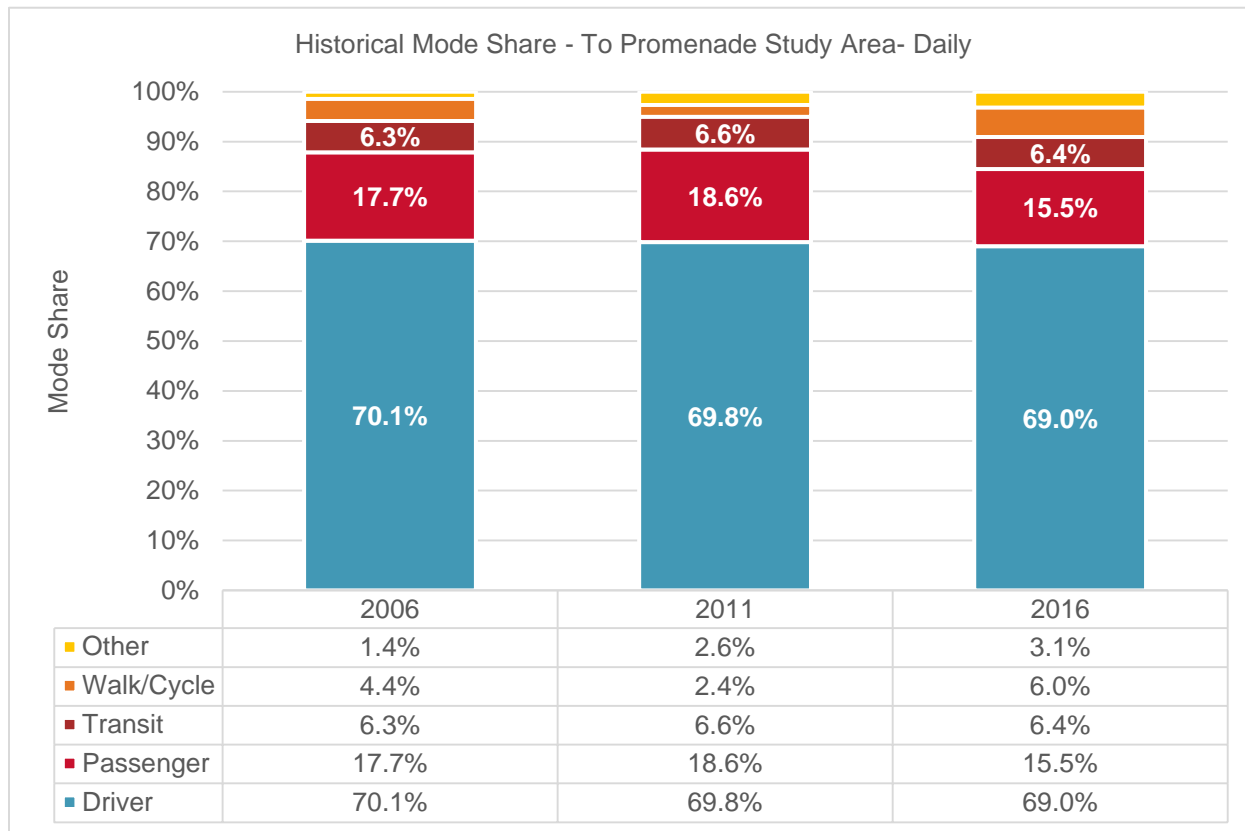
3.2.2 Mode Share

Historical Mode Share

The historical mode share to the study area is shown in **Figure 3-5**. The majority of trips to the study area are auto driver and passenger, and the mode share is relatively stable from 2006 to 2016. Less than 6% of trips are made by walking or cycling. Transit mode share is around 6% to 7%. The share of carpool trips to the study area ranges between 15% to 18%, which is similar to the carpool trip percentage in the City of Vaughan and York Region,

which is approximately 15%. This indicates there is a need to encourage sustainable travel modes, including transit, walk, cycle, and carpool to the study area and reduce auto usage.

Figure 3-5: Historical Mode Share to the Study Area (Daily, 2006 to 2016)



Source: 2006 - 2016 TTS

Daily and PM Peak Period Mode Share

Table 3-2 shows a comparison of the daily and PM peak period mode share (3 – 7pm). Results show that the PM mode share is very similar to the daily mode share, with slightly higher transit mode share and lower other mode share (mostly school bus trips) in the PM peak period.

Compared to the existing conditions, the York Region and City of Vaughan OP established much higher transit mode share targets, which is 50% along Centre Street and Bathurst Street (Regional Intensification Corridor) by 2031 in the PM Peak Period. The existing transit mode share for trips to the study area is 8%, indicating the need to improve rapid transit and local transit service, active transportation connections to transit stops, and implement TDM measures to discourage auto trips and encourage more transit trips.

Table 3-2: Daily and PM Peak Period Mode (3-7 pm) Share

| | Auto Driver | Auto Passenger | Transit | Walk | Cycle | Other | Total |
|------------------------------|-------------|----------------|---------|-------|-------|-------|--------|
| Number of Trips | | | | | | | |
| Daily Trips | 27,017 | 6,054 | 2,514 | 2,181 | 149 | 1,227 | 39,144 |
| PM Peak Period Trips (3-7pm) | 9,986 | 2,098 | 1,250 | 801 | 66 | 168 | 14,369 |
| Percentage by Mode | | | | | | | |
| Daily Trips | 69.0% | 15.5% | 6.4% | 5.6% | 0.4% | 3.1% | 100.0% |
| PM Peak Period Trips (3-7pm) | 69.5% | 14.6% | 8.7% | 5.6% | 0.5% | 1.2% | 100.0% |

Source: 2016 TTS

Short Distance Trip Mode Share

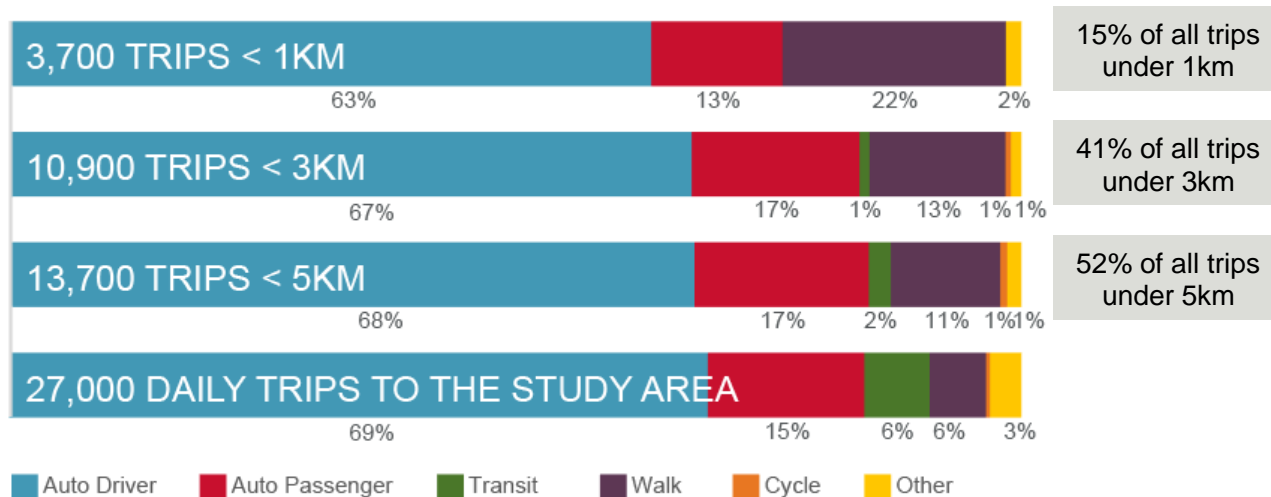
The daily trip mode share by distance is shown in **Table 3-3** and **Figure 3-6**. Approximately 15% of trips are under 1 kilometre, more than 40% of trips are under 3 kilometres, and over half (52%) of all trips are under 5 kilometres. However, most people choose to drive to the study area for these short-distance trips. The high percentage of short trips, particularly the ones under 1 km and 3 km, indicates a high potential for trips to be shifted to other modes of travel such as walking, cycling, and transit. With better active transportation infrastructure and better connection to transit, there is a high potential for trips to shift to more sustainable modes of travel in the future.

Table 3-3: Daily Mode Share by Trip Distance to Study Area

| | Auto Driver | Auto Passenger | Transit | Walk | Bike | Other | Total | % of All Trips |
|---------------------------|-------------|----------------|---------|-------|------|-------|--------|----------------|
| Number of Trips | | | | | | | | |
| All Trips | 27,017 | 6,054 | 2,515 | 2,182 | 149 | 1,227 | 39,144 | 100% |
| Under 5km | 13,692 | 3,481 | 443 | 2,182 | 137 | 287 | 20,222 | 52% |
| Under 3km | 10,875 | 2,671 | 164 | 2,165 | 86 | 170 | 16,131 | 41% |
| Under 1km | 3,690 | 755 | 0 | 1,284 | 0 | 90 | 5,819 | 15% |
| Percentage by Mode | | | | | | | | |
| All Trips | 69% | 15% | 6% | 6% | 0% | 3% | | |
| Under 5km | 68% | 17% | 2% | 11% | 1% | 1% | | |
| Under 3km | 67% | 17% | 1% | 13% | 1% | 1% | | |
| Under 1km | 63% | 13% | 0% | 22% | 0% | 2% | | |

Source: 2016 TTS

Figure 3-6: Daily Mode Share by Trip Distance to Study Area

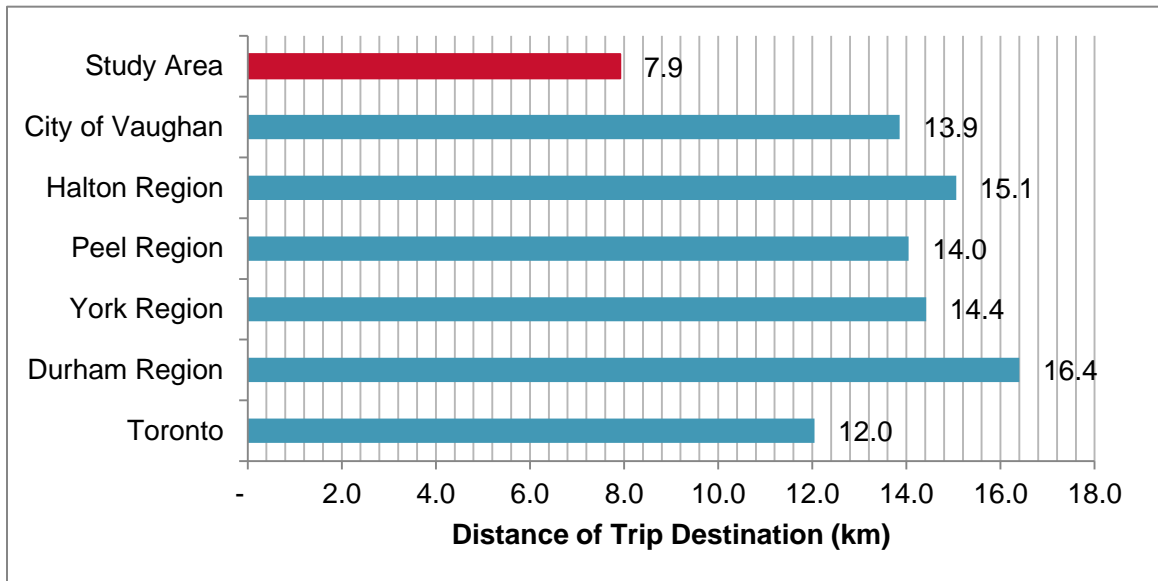


Source: 2016 TTS

3.2.3 Trip Length

The average trip length to the study area is 7.9 km (shown in **Figure 3-7**), which is significantly less than the average trip length measured for other geographies, such as the City-wide trip lengths for Vaughan, York Region, and the City of Toronto. Shorter trip distance indicates that the study area generally serves more local trips, and thus potential for more opportunities for active modes. The findings are consistent with research conducted by Tate Economic Research Inc, where it finds the majority of Promenade Centre’s customers come from within a 20-minute drive (70%) and the Centre is served more as a Regional Centre. Details of the analysis can be found in the Commercial Use Assessment report as part of the Secondary Plan study.

Figure 3-7: Average Trip Length to Study Area

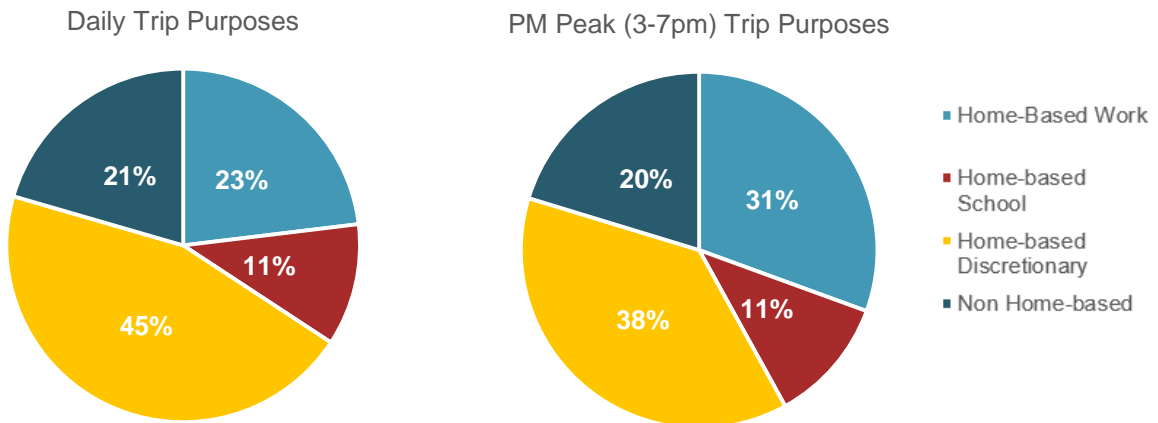


Source: 2016 TTS

3.2.4 Trip Purpose

Since the area is primarily commercial land use, most trips to the study area are discretionary trips, as shown in **Figure 3-8**.

Figure 3-8: Trip Purpose to Study Area



Source: 2016 TTS

3.2.5 Peaking Characteristics

The number of trips by start time and trip purpose for the Transportation Study Area as well as for Secondary Plan Study Area specifically are shown in **Figure 3-9** and **Figure 3-10**, respectively. For the study area, the peak hour is from 8:00 to 9:00 PM, with most trips being home-based work trips. This is likely due to the residential land use surrounding the Promenade Centre. Home-based discretionary trips peak between 4:00 and 5:00 PM.

Figure 3-10 shows the trip start time for the 2006 TTS Zone bounded by Centre Street to the north, Bathurst Street to the east, Clark Avenue to the south, and New Westminster

Drive to the east. The peak travel time is between 2:00 to 3:00 PM, mostly due to the high number of school trips from St Elizabeth Catholic High School, located to the northeast of the Clark Avenue and New Westminster Drive intersection. The peak for home-based discretionary trips is between 4:00 and 5:00 PM, when people are likely going to the Promenade Centre and surrounding restaurants and retail stores. The number of home-based work trips are relatively low for the entire day, which reflects the commercial nature of the land use of Promenade Centre.

Figure 3-9: Number of Trips by Start Time and Trip Purpose for the Transportation Study Area



Source: 2016 TTS
 Trips extracted for 2006 TTS zone 2124, 2025, 2143, and 2141

Figure 3-10: Number of Trips by Start Time and Trip Purpose for Secondary Plan Study Area



Source: 2016 TTS
 Trips extracted for 2006 TTS zone 2124

The southbound hourly traffic counts for on Bathurst Street, south of Promenade Circle is shown in **Figure 3-11**. Traffic counts were conducted from 7:00 to 9:00 AM and from 2:00 to 6:00 PM. Traffic volume increases throughout the afternoon and reaches the highest point around 4:00 PM and stays relatively high till 6:00 PM. This peaking characteristic reflects the commercial land use of the study area, where people tend to access the area in the afternoon.

The Saturday hourly traffic counts for the same location is shown in **Figure 3-12**. Rather than a peaking effect, traffic volumes remain relatively constant throughout the afternoon, starting the highest at noon (at 800) and remaining relatively the same level at just under 800. There is a bit of a drop in traffic for trips starting at 5pm, likely due to the mall closing at 6pm. This flat characteristic on the weekend suggests that there is a higher proportion of leisure trips due to the commercial nature of the area, leading to a fairly consistent stream of demand.

Figure 3-11: Weekday Hourly Traffic Counts, Bathurst Street Southbound, south of Promenade Circle (Thursday June 13, 2019)

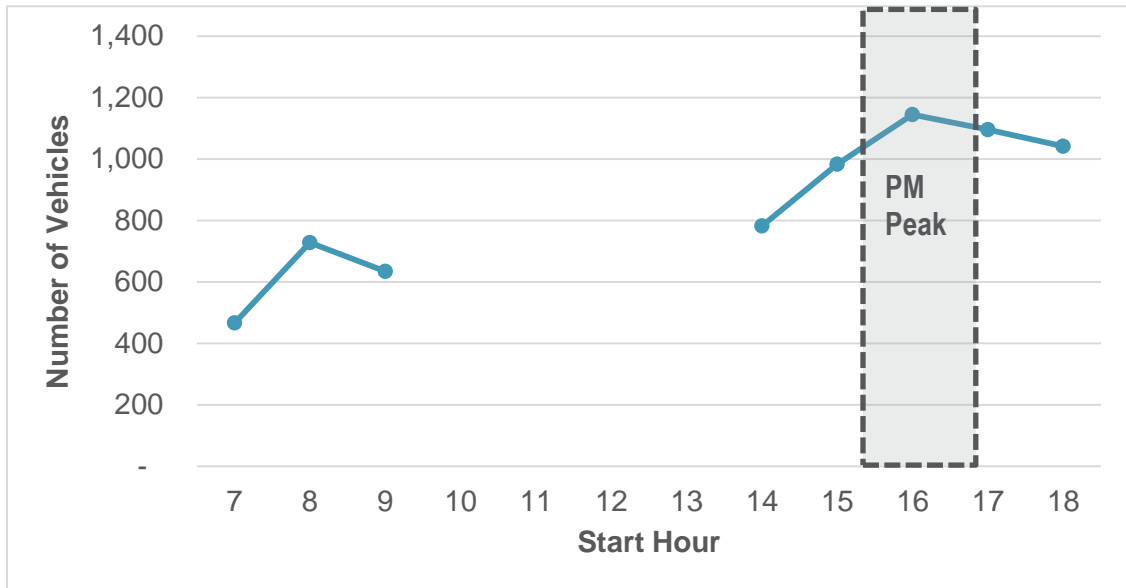
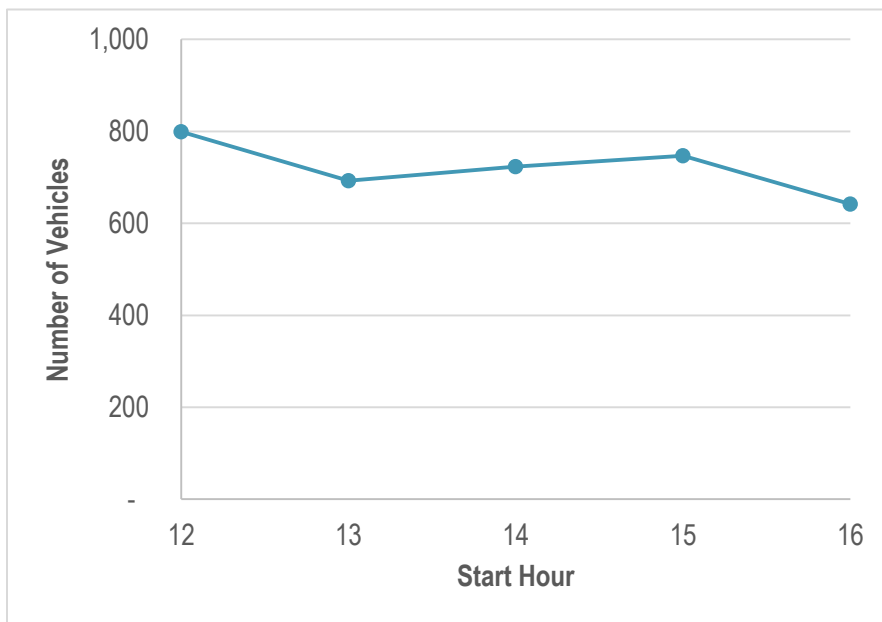


Figure 3-12: Saturday Hourly Traffic Counts, Bathurst Street Southbound, south of Promenade Circle (Saturday September 14, 2019)



3.3 Street Network Context

3.3.1 Connectivity and Continuity

As connectivity increases, travel distances decrease and route options increase, creating a more accessible network for all modes of travel. A well-connected network is generally more

pedestrian friendly and supports transit-oriented development by providing better connections from transit stops to destinations.

Two measures are employed to examine the connectivity and continuity of the street network within the study area – intersection density and link to node ratio. The analysis was conducted for the area bounded by Centre Street, Bathurst Street, Clark Avenue, and New Westminster Drive. This methodology is adapted from the Performance Indicators for the Greater Golden Horseshoe (GGH) Growth Plan. In both cases, private roads are considered as links but parking lot aisles and walkways, pathways through buildings such as malls, and informal pathways (i.e. goat trails) are not. A separate calculation is also carried out for pedestrian connectivity, including dedicated pedestrian pathways as links and excluding links that do not include pedestrian facilities and intersections that do not allow a pedestrian to travel in at least three directions. Clark, Bathurst, and Centre Streets are included in these calculations.

Intersection Density

Intersection density is the number of street intersections in a hectare. The method for calculating intersection density is derived from the Province's Performance Indicators for the Growth Plan for the Greater Golden Horseshoe. A higher number of street intersections indicates finer street networks and better connectivity. The Performance Indicators for the GGH Growth Plan recommends at minimum 0.3 intersections/hectare in municipalities, and 0.6 intersections/hectare for mixed use nodes and corridors.⁵ There are 14 intersections in the area bounded by Centre Street, Bathurst Street, Clark Avenue, and New Westminster Drive, which has an area of approximately 52 hectares. Therefore, the intersection density is 0.27 (intersection per hectare).

Link to Node Ratio

The Link to Node Ratio method determines the connectivity index of the study area by finding the ratio of street links to street nodes. Links are the roadway or pathway segment between two nodes and nodes are intersections or end of a cul-de-sac. The method for calculating intersection density is derived from the City of Calgary's Connectivity Handbook⁶. A higher link to node ratio means that travellers have more route choices. While there is no accepted standard for link-node ratio, some studies recommend that a score of 1.4 is needed to support a walkable community.⁵ The calculations are summarized in **Table 3-4**.

⁵ Performance indicators for the growth plan for the Greater Golden Horseshoe, Ministry of Municipal Affairs and Housing, 2015

⁶ The Calgary Transportation Plan Connectivity Handbook, 2010, https://www.calgary.ca/Transportation/TP/Documents/CTP2009/ctp_connectivity_handbook.pdf?noredirect=1

Table 3-4: Link to Node Ratio

| Mode | Number of Links | Number of Nodes | Connectivity Index |
|------------|-----------------|-----------------|--------------------|
| Auto mode | 19 | 14 | 1.36 |
| Pedestrian | 16 ¹ | 14 | 1.14 |

Note: analysis was conducted for the area bounded by Centre Street, Bathurst Street, Clark Avenue, and New Westminster Drive

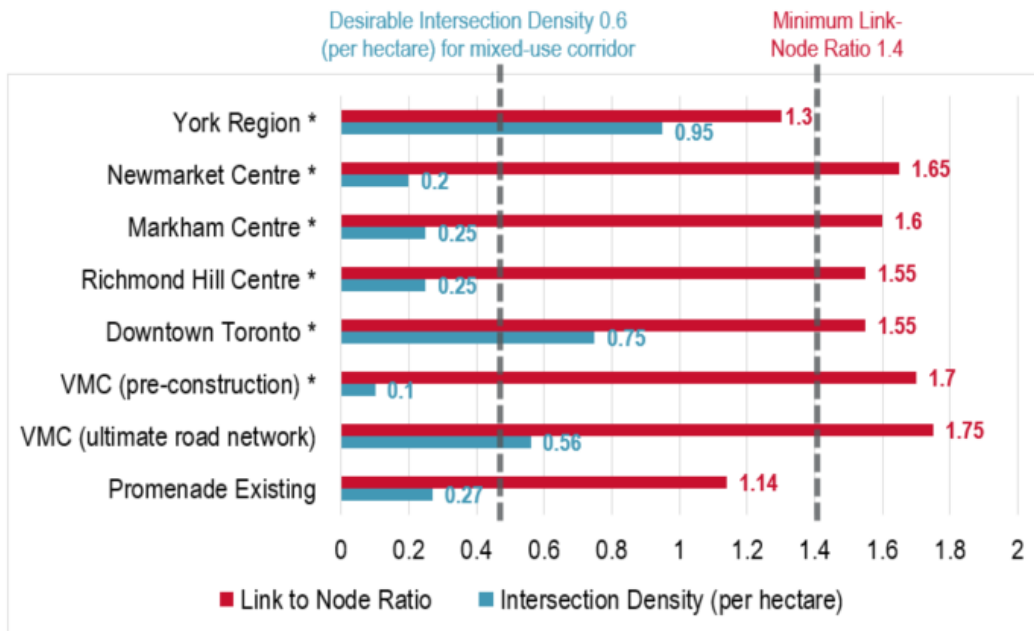
¹ No sidewalks on the eastern portion of Promenade Circle

Discussion

The existing intersection density and link-node ratio for active transportation in the Promenade Secondary Plan area in comparison to other urban centres is shown in **Figure 3-13**. The study area scores low for both intersection density and link-node ratio, indicating the area has large blocks and is not be conducive to walking. They are mostly due to the fact that the site is made up of only a few very large blocks (for example, the distance between Centre Street and Clark Avenue is more than 800 metres or 10 minutes of walking distance) and a circle driveway to access the centre.

It is noted that Intersection density and the link to node ratio are complementary, and a well-connected network would receive high scores for both indicators. Improving connectivity in the core of the site, especially for active modes will be an important focus of the future planning framework for the study. Attention will be paid to the opportunity to tie new routes to existing links to adjacent residential neighbourhoods.

Figure 3-13: Intersection Density and Link-Node Ratio

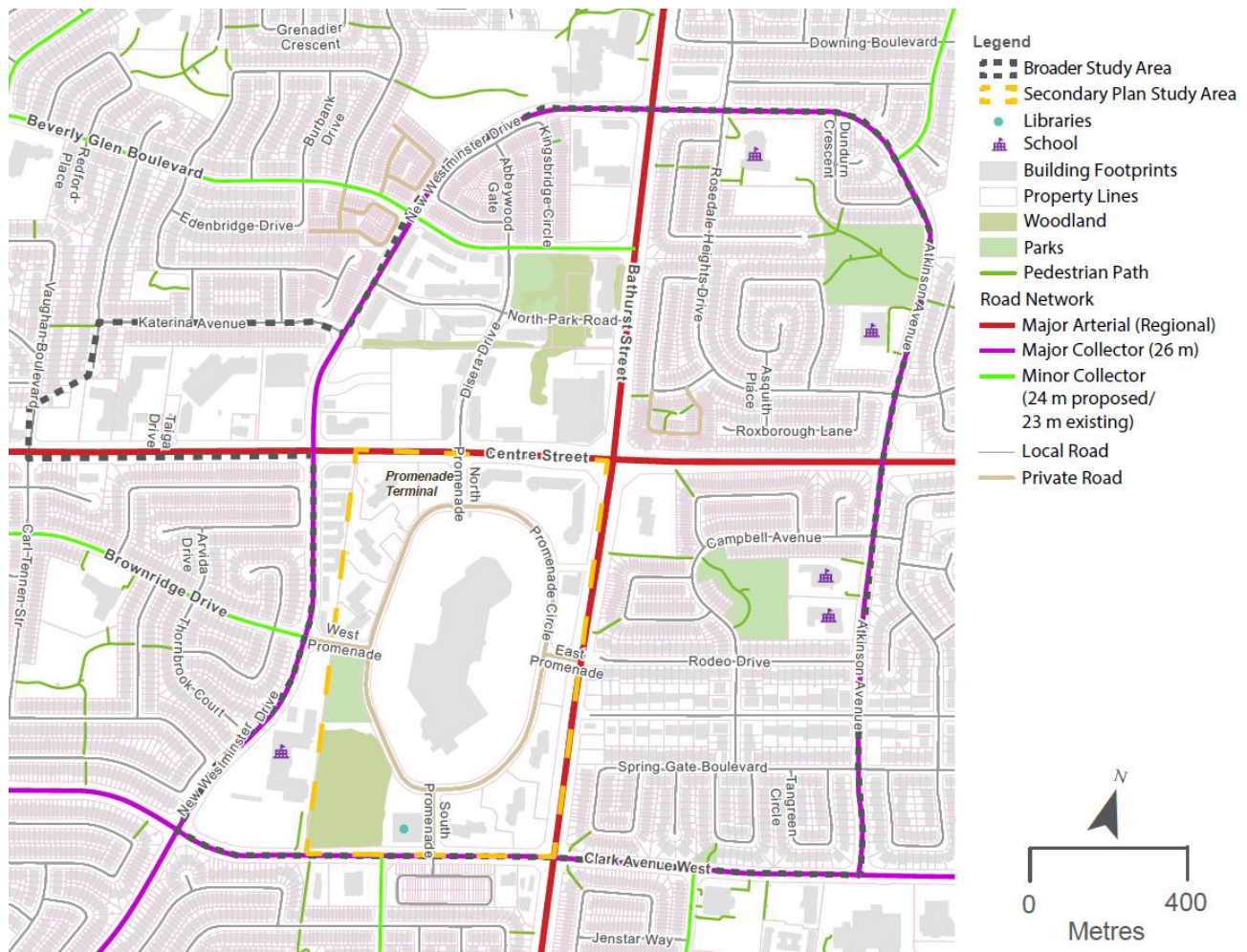


* Source: Performance Indicators for the Growth Plan for the Greater Golden Horseshoe.

3.3.2 Current Road Network

The existing road classification and right-of-way (ROW) are shown in **Figure 3-14**, based on York Region and City of Vaughan Official Plan. Centre Street and Bathurst Street are both Regional major arterials, and New Westminster Drive and Atkinson Avenue, which forms the boundary of the transportation study area, are major collectors with 26m ROW. Promenade Circle and connections to Promenade Circle are private roads. Any proposed changes to these roads should consider relevant jurisdictions.

Figure 3-14: Existing Road Classification and Right-of-Way



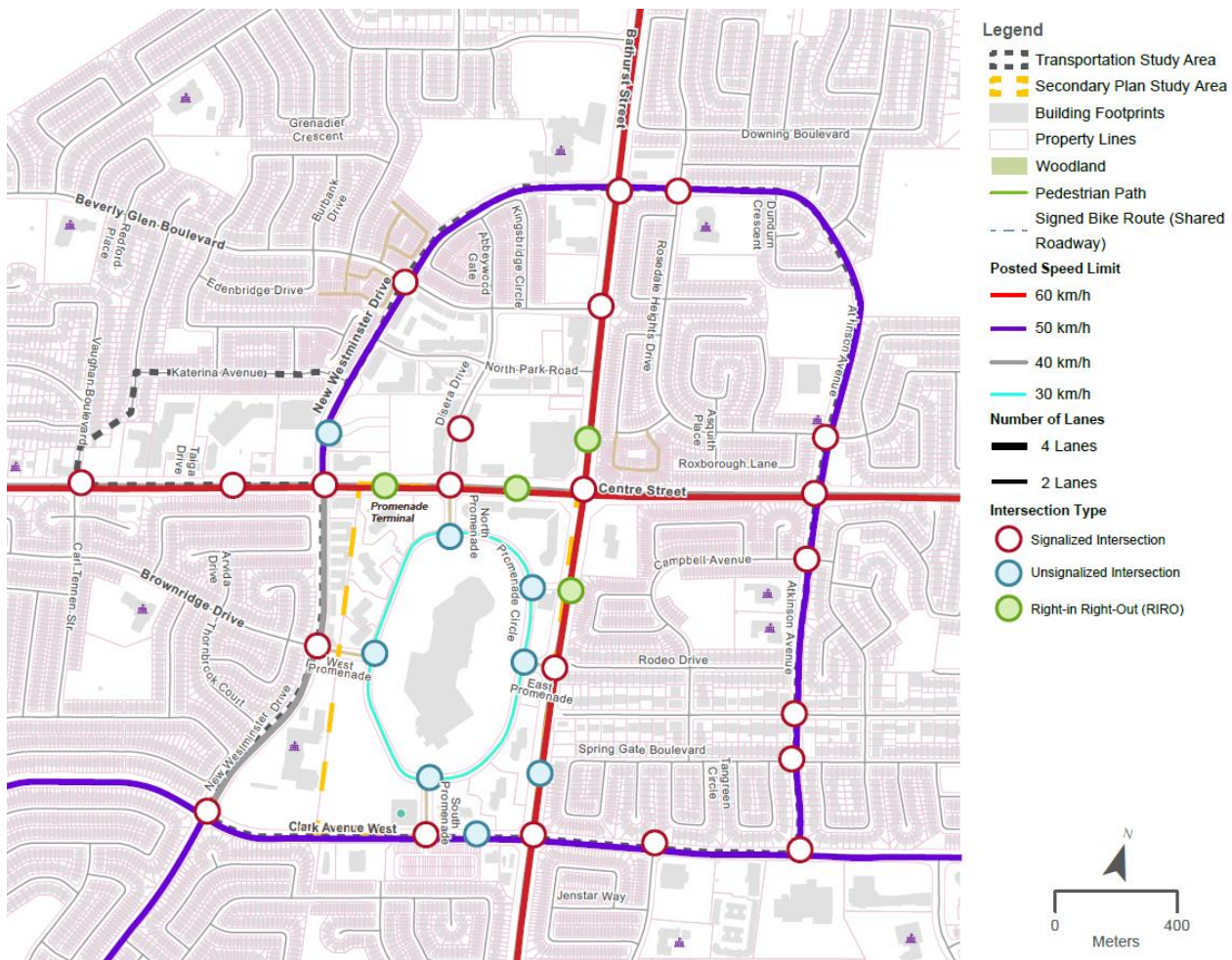
Source: York Region Open Data, York Region Official Plan (2010), City of Vaughan Official Plan (2010)

Arterial and major collector roads that serve the area generally operate with 4 lanes at 50 to 60 km/h, which include New Westminster Drive, Atkinson Avenue, Clark Avenue West, Bathurst Street, and Centre Street. An exception is New Westminster Drive between Clark Avenue and Centre Street, operating at 40 km/h. Most minor collector and local roads generally operate with 2 lanes at 40 km/h and serve mostly low-rise residential areas. Minor collector roads in the study area include Beverly Glen Boulevard and Brownridge Drive. Within the Secondary Plan Study area, Promenade Circle operates with 2 lanes at 30 km/h.

Signalized operations are present at all major intersections. Unsignalized intersections in the form of right-in right-out (RIRO) and non-restricted movements exist at other locations to provide access to plazas and residential areas.

The existing road network with lane configurations, speed limits, and traffic controls are illustrated in **Figure 3-15**.

Figure 3-15. Existing Road Network (Lane configurations, speed limits, traffic control)



3.3.3 Goods Movement Corridor

The following Regional Roads are part of the Secondary Goods Movement Corridor as indicated in York Region TMP (2016):

- Bathurst Street; and
- Centre Street west of Bathurst Street.

Other roads in the study area are not part of the Strategic Goods Movement Corridors.

3.3.4 Safety Analysis

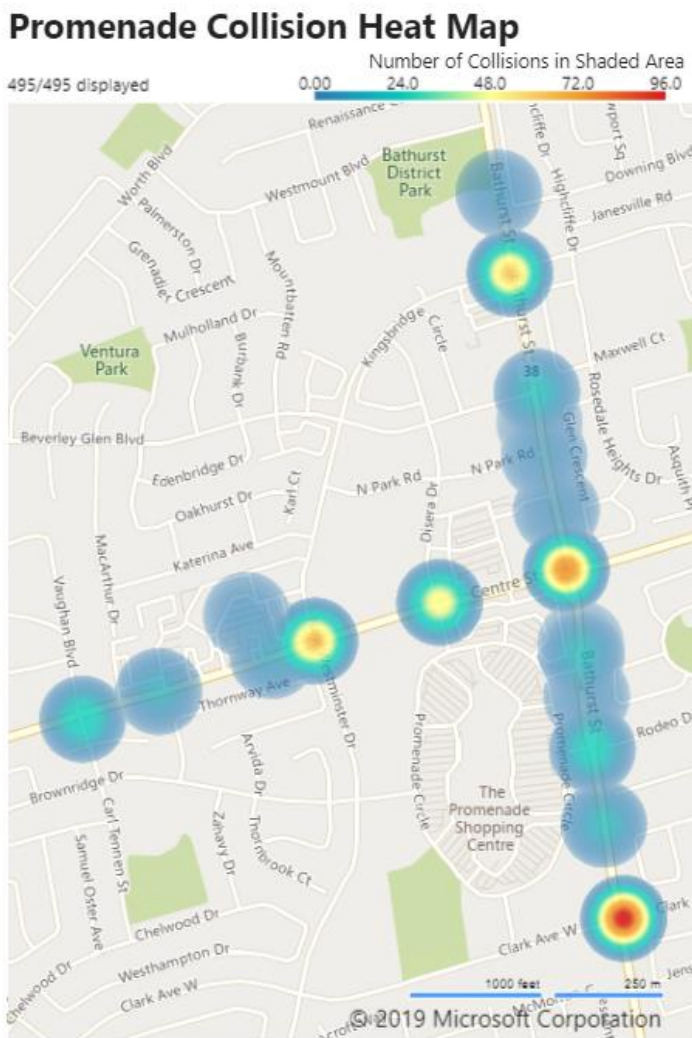
Overview

A desktop review of available collision data on Regional Roads in the study area was conducted to identify any existing operational and safety issues. The results of this collision analysis will inform the recommendations of the future network and input to the design of streets and connections in improving safety for all road users. This section summarizes the result of the safety analysis. The detailed collision analysis can be found in **Appendix A**.

The collision data was provided by York Region and covers intersection and midblock locations along Regional Roads in the study area over a 5-year period from January 2014 to December 2018. 2019 data from January and February was also provided, but not included in the analysis to prevent over representation of collisions that would occur during these months. It is to be noted that safety analysis was not conducted for roads under the City jurisdiction since the data was not available.

Over the 5-year period, a total of 495 collisions were recorded and assessed in this analysis. A heatmap of all collisions within the study area is shown in **Figure 3-16**, with colour schemes where red colour show locations where collisions are most prominent. A high number of collisions are observed at the intersections of Bathurst Street and Clark Avenue (96 collisions), Bathurst Street and Centre Street (78 collisions), Centre Street and New Westminster Drive (65 collisions), and Bathurst Street and New Westminster Drive/Atkinson Avenue (62 collisions).

Figure 3-16: Promenade Centre Study Area Collision Heat Map (January 2014 to December 2018)



Overall collision statistics are provided in **Figure 3-17**. A slight decrease in collisions have been seen yearly since 2014, with an increase once again in 2018. Monthly collisions are highest during the winter months, likely due to worsened road conditions due to ice or snow. Hourly data shows that PM peak hour has the highest amount of collisions, but it is generally high between 9 AM and 7 PM, reflecting that Promenade Centre being a major centre attracting trips throughout the day. Vulnerable road users (pedestrians and cyclists) account for 5% of all collisions.

Figure 3-17: Key Collision Statistics (January 2014 to December 2018)

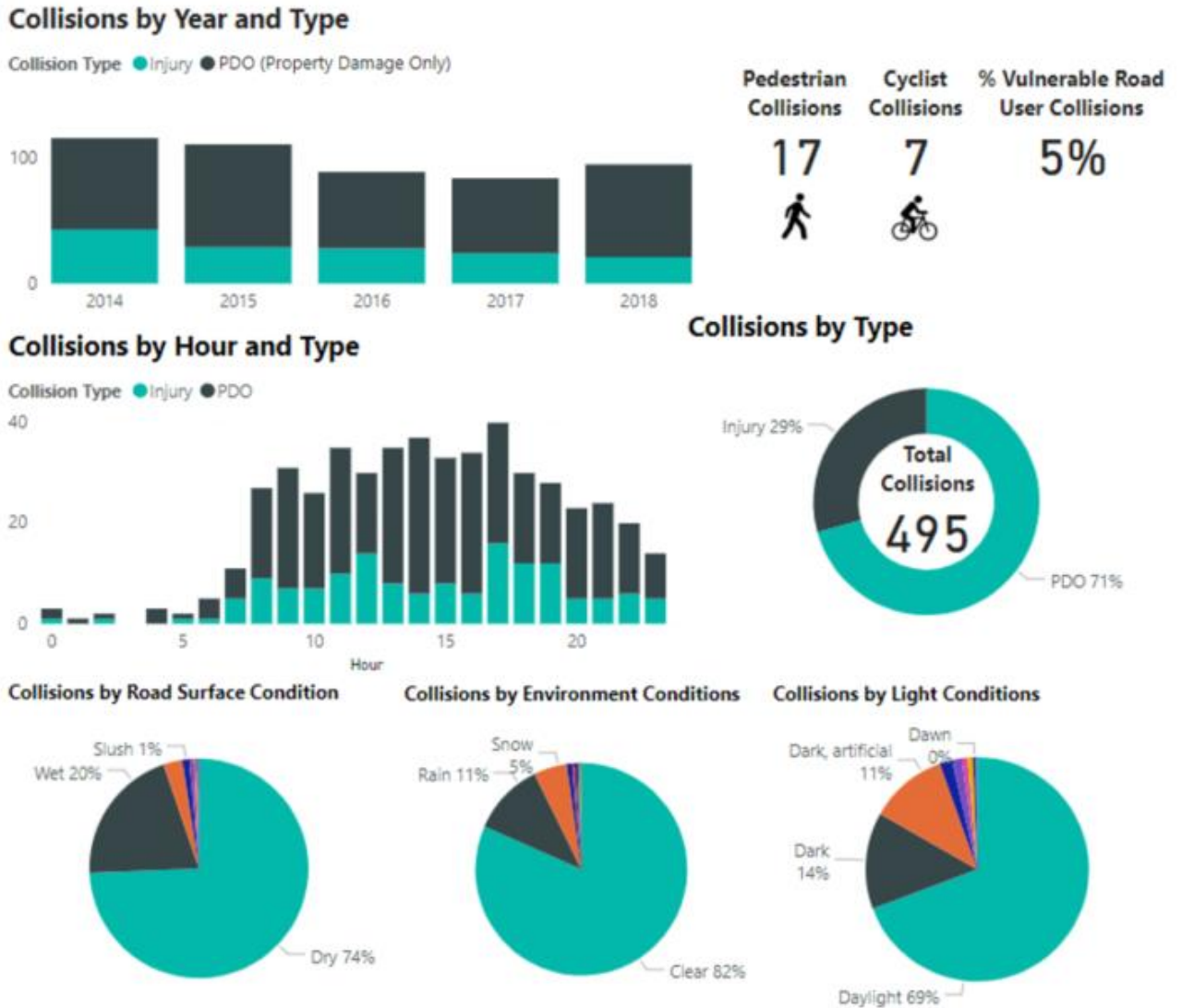


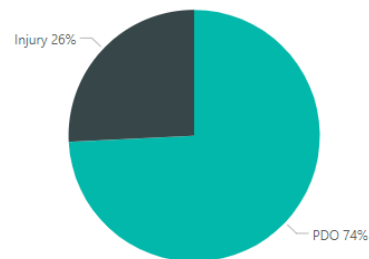
Figure 3-18 shows detailed collision statistics for pedestrian and cyclists. Pedestrians and cyclists are highly vulnerable in collisions, as the data shows that all 24 collisions have resulted in injuries, compared to the 26% observed involving only vehicles and resulting in Property Damage Only (PDO) at 74%. A further look into the accident location for pedestrians and cyclists reveals that 95% of these accidents occurred at or related to intersection collisions. This number is high compared to non-pedestrian and cycling mode collisions, which is 75%.

Figure 3-18: Collision Statistics for Pedestrians and Cyclists and other modes by Severity and Location (January 2014 to December 2018)

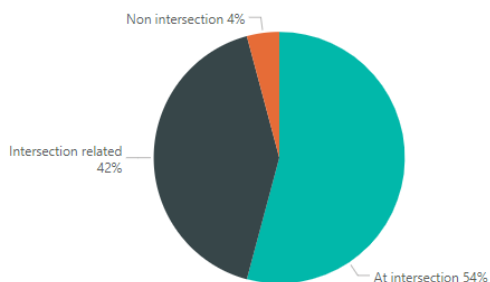
Collisions by Type for Pedestrian and Cycling Modes



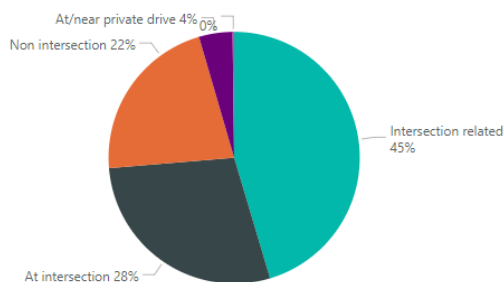
Collisions by Type for Non Pedestrian and Cycling Modes



Collisions by Type for Pedestrian and Cycling Modes



Collisions by Type for Non Pedestrian and Cycling Modes



Average Collision Rates

Average collision rates per intersection and average collision rates per-1km sections (relative to average annual daily traffic) were calculated to identify any critical locations that would not have been otherwise identified due to lower absolute number of collisions.

The collision rates for each intersection and segment are provided in **Table 3-5** and **Table 3-6**, respectively. Detailed methodology of how the collision rates were calculated can be found in **Appendix A**.

Table 3-5: Average Collision Rates of Intersections in Promenade Centre Study Area

| Intersection | Total Collisions (2014-2018) | 2019 AADT * | 5 Year Collision Rate | Average Collision Rate |
|---------------------------------------|------------------------------|-------------|-----------------------|------------------------|
| Bathurst and Clark | 96 | 84,600 | 3.11 | 0.62 |
| Bathurst and Centre | 78 | 68,400 | 3.12 | 0.62 |
| Centre and New Westminster | 65 | 59,400 | 2.99 | 0.60 |
| Bathurst and Atkinson-New Westminster | 62 | 71,100 | 2.39 | 0.48 |
| Centre and North Promenade-Disera | 44 | 45,200 | 2.66 | 0.53 |
| Centre and Carl Tennen-Vaughan | 26 | 41,700 | 1.71 | 0.34 |
| Bathurst and Promenade | 24 | 56,600 | 1.16 | 0.23 |
| Bathurst and Beverly Glen | 16 | 50,000 | 0.88 | 0.18 |
| Bathurst and North Park | 5 | 48,300 | 0.28 | 0.06 |
| 1054 Centre | 5 | 40,700 | 0.34 | 0.07 |
| Bathurst and North Promenade | 2 | 56,700 | 0.10 | 0.02 |
| Bathurst and 7601 Bathurst Street | 1 | 46,400 | 0.06 | 0.01 |

* AADT calculated based on PM peak hour with an hourly to daily conversion factor of 8

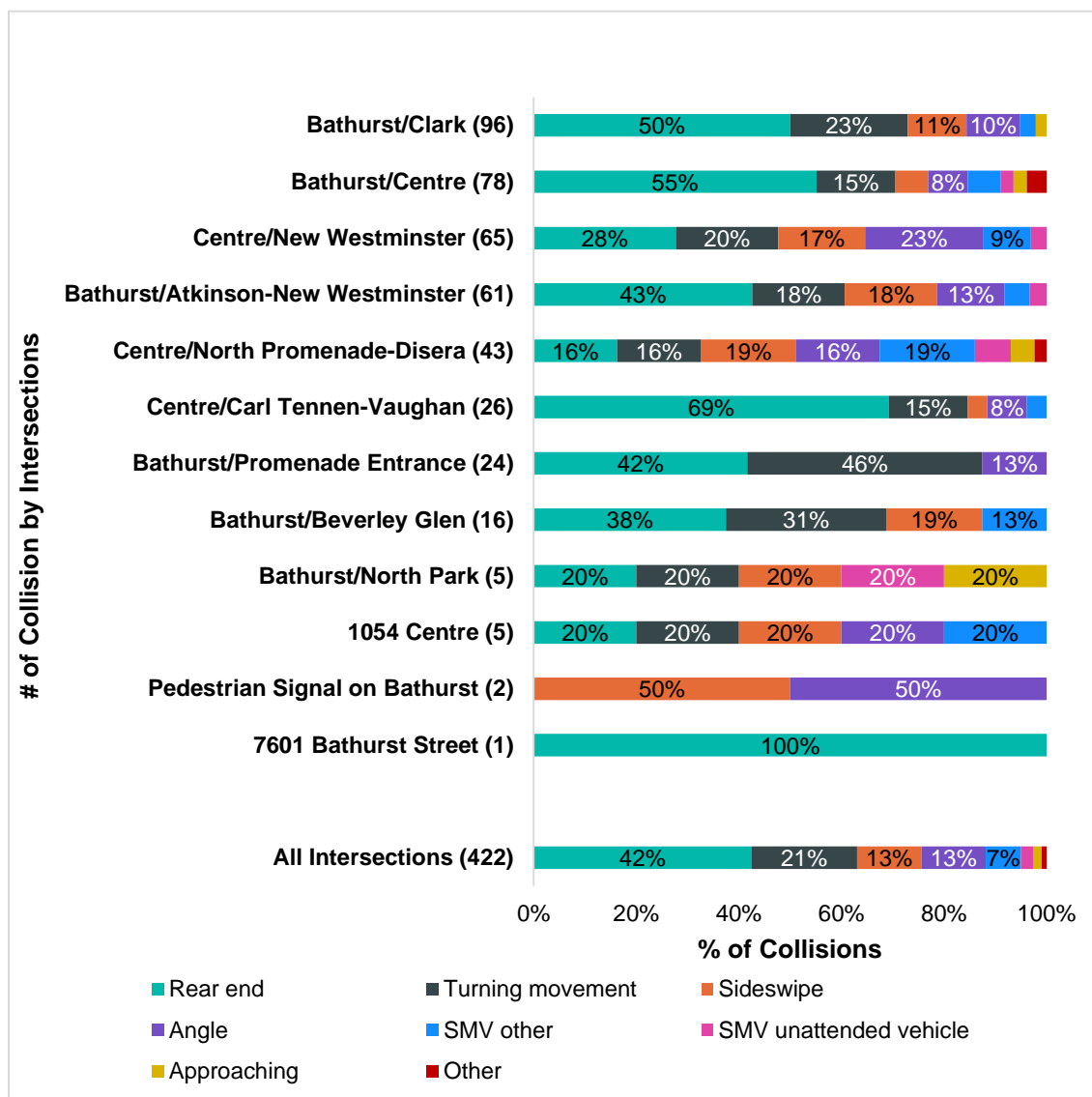
Table 3-6: Average Collision Rates of Segments in Promenade Centre Study Area

| Segment | Total Collisions (2014-2018) | 2019 AADT* | 5 Year Collision Rate | Segment Length (m) | Average Collision Rate |
|--|------------------------------|------------|-----------------------|--------------------|------------------------|
| Bathurst @ Clark & East Promenade | 15 | 27,000 | 3.75 | 400 | 0.75 |
| Bathurst @ 7601 Bathurst & Centre | 12 | 23,200 | 8.48 | 170 | 1.70 |
| Centre @ Carl Tennen & 1054 Centre | 12 | 18,900 | 5.49 | 320 | 1.10 |
| Centre @ 1054 Centre & New Westminster | 9 | 20,300 | 8.18 | 150 | 1.64 |
| Bathurst @ Beverly Glen & Atkinson-New Westminster | 6 | 23,500 | 1.93 | 360 | 0.39 |
| Bathurst @ Centre and North Park | 5 | 22,300 | 2.72 | 230 | 0.54 |
| Centre @ new Westminster & North Promenade-Disera | 5 | 17,200 | 2.76 | 290 | 0.55 |
| Bathurst @ East Promenade & Pedestrian Signal | 4 | 23,000 | 1.66 | 290 | 0.33 |
| Centre @ Bathurst & North Promenade-Disera | 2 | 13,700 | 1.33 | 300 | 0.27 |
| Bathurst @ North Park & Beverly Glen | 1 | 23,500 | 0.51 | 230 | 0.10 |

* AADT calculated based on PM peak hour with an hourly to daily conversion factor of 8

Intersections with high average collision rates were found to also have a corresponding high number of collisions in the past 5 years, thus no particular issues were determined through this high level analysis. A breakdown of impact types at intersections is provided in **Figure 3-19**.

Figure 3-19: Number of Collision by Impact Type at Intersections (2014-2018)



The following observations are noted at intersections:

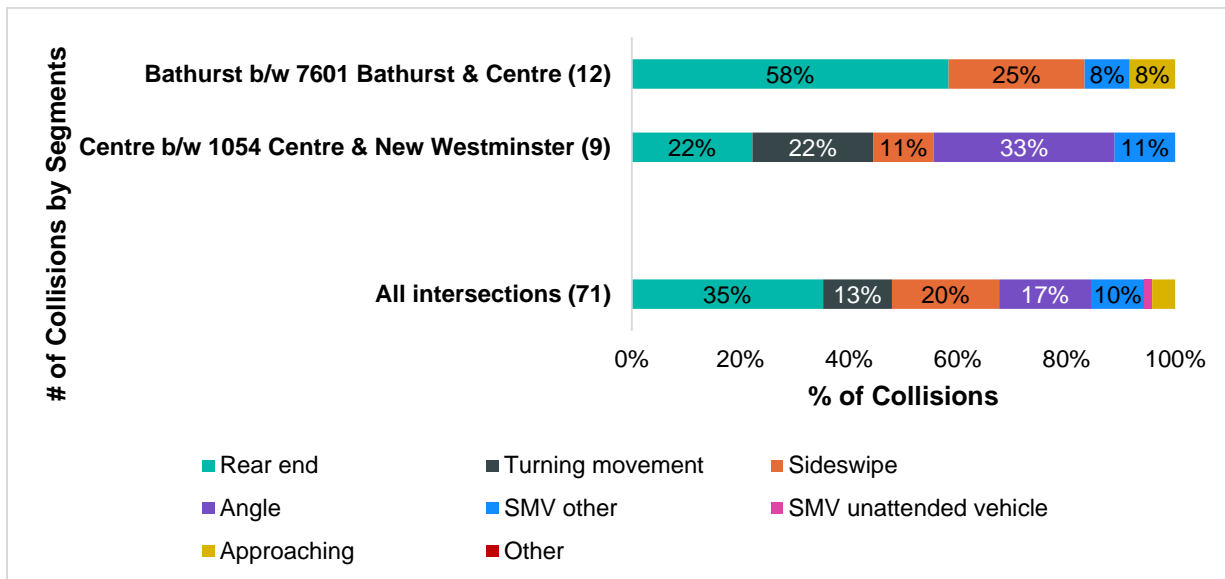
- Rear end collisions** account for 40% of all intersection collisions, with 50% of these collisions being a result of vehicles following too closely. It is unlikely that environmental considerations are a contributing factor as most collisions occurred during clear and dry conditions.
- Centre Street and New Westminster Drive** exhibits a high number of angle collision. A common reason for these collisions include drivers disobeying traffic control, which contributed to 50% of these collisions. A strong correlation between angle collisions and external factors could not be determined as most collisions occurred during acceptable road and environment conditions. A Google Streetview of this intersection shows acceptable sightline conditions and grade. It is to be noted that the vivaNEXT construction has been ongoing along Centre Street since 2017, which could have induced irresponsible driving behaviour due to reduced lanes. However, a high number of angle collisions still occurred pre-construction. This intersection should be continually

monitored in the future to identify any patterns that emerge that may lead to increased angle collisions.

- **Centre Street and North Promenade/Disera Drive** has a high number of Single-motor-vehicle collisions, comprising 18% of all collisions at this intersection compared to the 7% for all intersections in general. These collisions typically involves pedestrians, which may be attributed to the higher pedestrian volumes at this intersection and indicates a strong need to improve the pedestrian environment for this intersection.
- **Centre Street and Carl-Tennen Street/Vaughan Boulevard** has a high number of rear-end collisions, with 44% of collisions being a result of vehicles following too closely. A third of these collisions occurred during non-clear road conditions, such as rain and snow, which may have been a contributing factor.
- **Bathurst Street and East Promenade** exhibits a high number of turning movement collisions. Many of these collisions are from the westerly and northerly movements, which correspond with left turn movements entering and exiting Promenade Mall. A common cause of turning movement collisions is insufficient vehicle clearance intervals at intersections. Although adequate clearance time is provided for the eastbound left turning movement (3.5 seconds), more time may be needed for the northbound left turning movement (1 second).

The two segments identified with high collision rates based on their relative short segments were also further analyzed to identify potential problems. **Figure 3-20** provides a breakdown of impact types.

Figure 3-20: Number of Collision by Impact Type along Segments (2014-2018)



- **Bathurst Street between 7601 Bathurst & Centre Street** has a high number of rear-end collisions. Rear end collisions usually occur from leading vehicles suddenly stopping, causing collisions from trailing vehicles. It is unlikely environmental conditions are a contributing factor as 80% of collisions occurred during clear road conditions. Common causes for vehicles stopping include pedestrian crossings and side-street traffic from accesses, which both features exist immediately south of this segment near the access to 7601 Bathurst Street. A re-evaluation of the traffic control at this location

may be required to determine if this location is operating adequately based on traffic and safety conditions present day.

- **Centre Street between 1054 Centre Street & New Westminster Drive** exhibits a high number of angle collisions. A gas station is located within this segment, with left turns permitted to allow eastbound vehicles to enter and exit from Centre Street. With 1054 Centre Street and New Westminster Drive each being less than 150m away, there may be limited gaps for left turning vehicles. This may lead to irresponsible driving behaviors when making left turn movements, leading to increased angle collisions.

Next Steps

It is recommended locations identified with anomalies for specific collision types from the detailed analysis should continue to be monitored, which include:

- Centre Street and New Westminster Drive (angle collisions)
- Centre Street and North Promenade-Disera Drive (single-motor-vehicle collisions)
- Centre Street and Carl-Tennen Street/Vaughan Boulevard (rear-end collisions)
- Bathurst Street and East Promenade (turning movement collisions)
- Bathurst Street between 7601 Bathurst & Centre Street (rear-end collisions)
- Centre Street between 1054 Centre & New Westminster Drive (angle collisions)

These locations should be kept in consideration for future improvements for the study area.

Pedestrian and cycling facilities can also be further improved to increase safety for vulnerable users, particularly at an intersection level. Detailed analysis for the pedestrian and cycling environment can be found in **Section 3.5** and **Section 3.4**, respectively.

Lastly, safety conditions should be continued to be monitored after the completion of vivaNEXT construction on Centre Bathurst and Bathurst Street, in order to understand the impact of this new infrastructure.

3.4 Pedestrians

3.4.1 Existing Pedestrian Network

The existing sidewalk network within the study area is largely complete (**Figure 3-21**), with the majority of sidewalks having a width of 1.5m. Most streets have sidewalks on both sides but some, including the side of Promenade Circle closest to Promenade Centre, and part of Bathurst Street north of Centre Street, have a sidewalk on one side only. Promenade Centre is largely inaccessible to pedestrians; it is surrounded by surface parking on all sides. Only one direct entrance boulevard leads pedestrians to the mall and is located at the terminus of East Promenade, as seen in **Figure 3-22**.

Figure 3-21: Existing Pedestrian Network

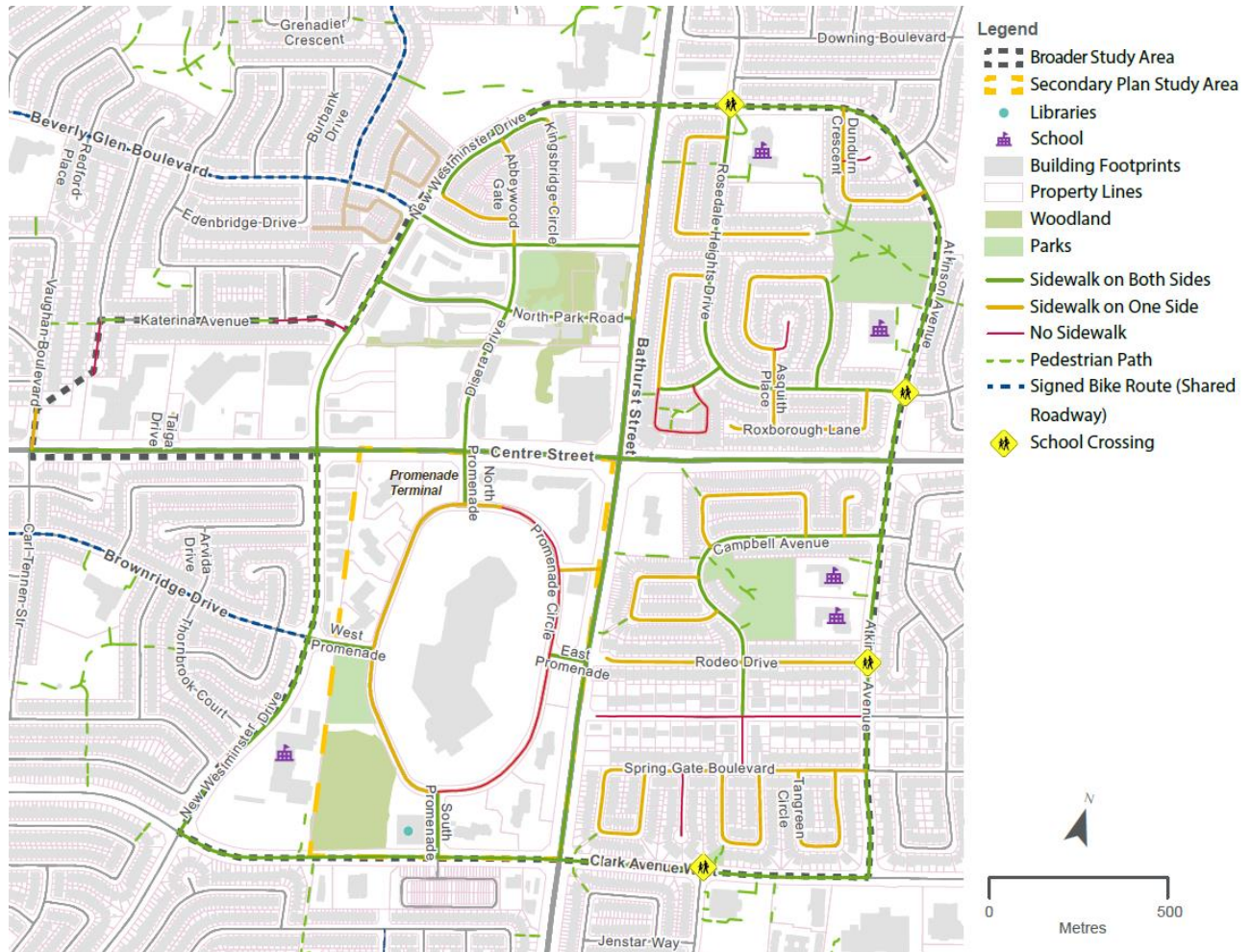
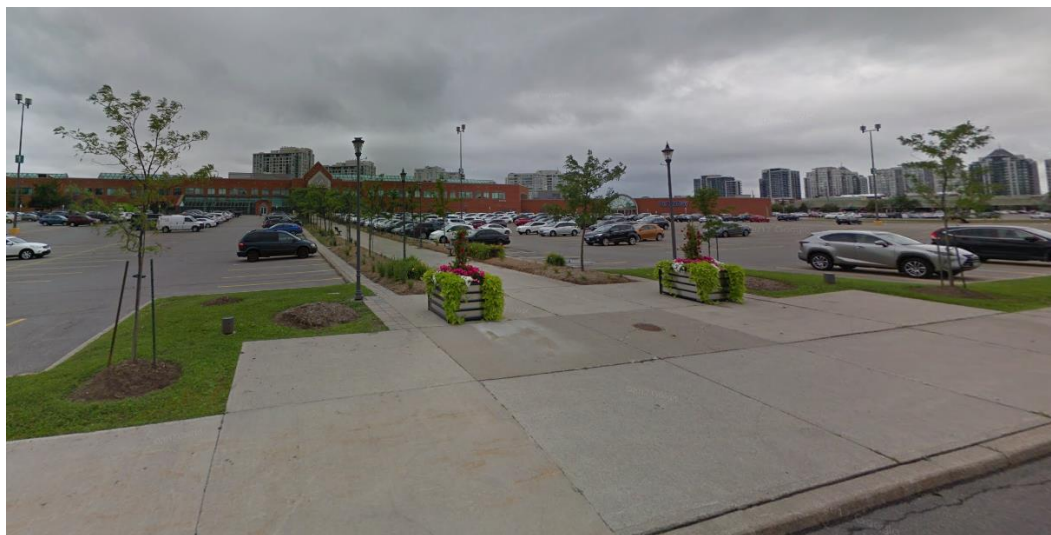


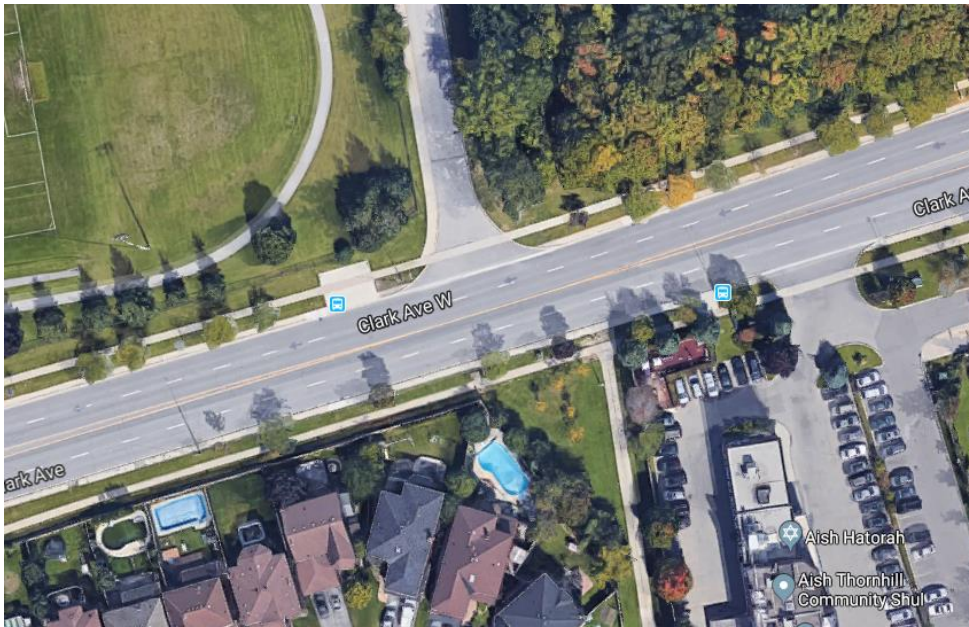
Figure 3-22: Promenade Centre East Entryway



Source: Google Maps

Pedestrian crossings are generally either missing or in poor condition throughout the study area. Around Promenade Circle, crosswalk markings are often faded or completely non-existent. On Clark Street west of New Westminster Drive, there is no pedestrian crossing between St Elizabeth Catholic High School and the pedestrian path to the south (**Figure 3-23**), which connects further south to Downham Green Park. Many intersections also have large corner curb radii which increases pedestrian crossing distances while allowing vehicles to make faster turns, further reducing pedestrian comfort (**Figure 3-24**). However, school crossing signage is common and has been observed at four locations with for school locations crossing major streets such as Clark Avenue and Atkinson Avenue.

Figure 3-23: Missing Link between St. Elizabeth Catholic High School and Pedestrian Path on Clark Avenue



Source: Google Street View

Figure 3-24: Large corner curb radius at intersections around Promenade Circle



Source: HDR

There are also instances where sidewalks within residential neighbourhoods are missing on at least one side of the street, as is the case with Abbeywood Gate, Vaughan Boulevard, Katerina Avenue and MacArthur Drive. Pedestrian facilities on existing local and collector streets are generally in better condition as they accommodate asphalt or grass buffers separating the sidewalk from traffic. These boulevards occasionally contain trees and provide some safety benefits for pedestrians.

Pedestrian-friendly public realms were encountered at select locations in the study area. For instance, Atkinson Avenue between Bathurst Street and Centre Street has wider sidewalks, up to 2.5m wide. North of Centre Street, the retail-focused Disera Drive has planters, wide sidewalks and paved buffers as seen in **Figure 3-25**. Moreover, the under-construction Bathurst Street and Centre Street vivaNext project will introduce 2.0m wide sidewalks, per the design drawings provided by YRT. Raised cycle tracks and trees on Bathurst Street north of Centre Street and on Centre Street West of Bathurst Street will provide additional separation between vehicles and pedestrians. Textured and coloured pavement marking the crosswalks being rebuilt through the vivaNext project will also improve the pedestrian realm at intersections.

Figure 3-25: Pedestrian-friendly streetscaping on Disera Drive, north of Centre Street



Source: HDR

3.4.2 Pedestrian Level of Service

Pedestrian LOS Methodology

Similar to the BLOS, the pedestrian level of service (PLOS) methodology is based on the York Region Transportation Mobility Plan and enhanced by the City of Ottawa's Multimodal Analysis Guideline. PLOS is calculated at the intersection and mid-block in recognition that a pedestrian's experience is determined by the conditions both between crossings and at the crossing itself.

The base criteria used to measure the performance or level of service are similar for the most part, such as the width of active transportation facilities and their separation from the

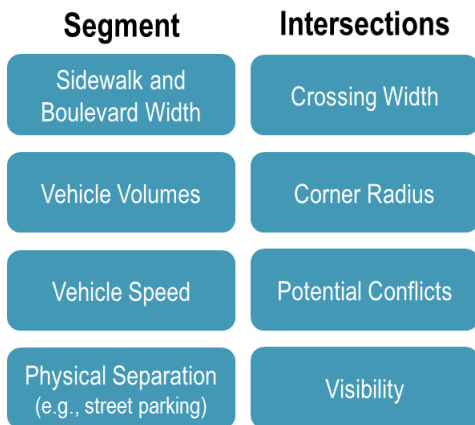
roadway curb. Compared to the York Region methodology, the Ottawa methodology incorporates additional considerations that help better capture the nuances of different road typologies and their effect on user experience. When walking, factors such as traffic volumes on the adjacent roadways, on-street parking, and roadway operating speeds have an impact on a pedestrian's level of comfort and should not be neglected. At the intersection level, the Ottawa methodology offers a more detailed review of the user experience, including crossing distances, corner radii and signal phasing and timing features, to produce an intersection level of service for pedestrians. Overall, the York Region TMP multi-modal level of service methodology is a good baseline from which to conduct an existing conditions review. Nevertheless, the Ottawa methodology sets a higher level of standard that is arguably more appropriate for urbanizing areas that aim to prioritize active transportation. For example, a 1.5m sidewalk with no buffer adjacent to a 70km/hr road receives an "F" under the Ottawa MMLOS methodology but a "C" under York Region's guidelines.

The methodology for the evaluation of **segment PLOS** utilizes a look-up table approach based on cross-section and roadway characteristics (e.g., sidewalk and boulevard width, traffic volumes, presence of on-street parking, and operating speed).

Intersection PLOS uses the Pedestrian Exposure to Traffic at Signalized Intersections (PETS) and assigns points based on a number of crossing characteristics (e.g., crossing distance, presence of a median, presence of a crossing refuge, turning restrictions, right hand turn characteristics, curb radii, etc.). The input for the PLOS is summarized in **Figure 3-26**. However, as the Promenade Centre study area also contains unsignalized intersections, certain modifications and assumptions have been made to readapt the Ottawa methodology to unsignalized intersections in the study area. These revisions include:

- Understanding that stop and yield controlled approaches affect the pedestrian experience the same way a "permissive" signalized movement does, such as when a right-turn-on-red is allowed and a green is permissive. Because the turn is allowed based on driver judgment, pedestrians will feel less safe where a car is waiting to make the turn in their vicinity.
- Penalizing intersections that do not provide a curb separating pedestrians from turning vehicles. Visibility is an important factor in pedestrian safety.

Figure 3-26: Inputs for Pedestrian LOS



The average score of each intersection approach is averaged to determine the overall intersection PLOS. Scoring ranges as follows:

- PLOS ‘A’ to ‘C’** – Attractive to most pedestrians, including locations where lower speeds and volumes, wider sidewalks, and larger boulevards with ample separation from moving traffic are present. Crosswalks are provided on all four legs of the intersections and with shorter crossing distances at intersections. Lakeshore Road around Orchard Road, shown in **Figure 3-34** has a high quality pedestrian environment due to the 3.0m existing multi-use path for use by pedestrians and the ample treed separation from the roadway, explaining its PLOS score of “A” score.
- PLOS ‘D’ to ‘E’** – Elements may not appeal to pedestrians due to narrow sidewalks, lack of separation from traffic, longer crossing distances, etc. Though acceptable, streets with narrow sidewalks and minimal separation from high volume, high speed roads receive PLOS scores between “D” and “E”, as displayed in **Figure 3-34** for New Westminster Drive, just north Centre Street.
- PLOS ‘F’** – Not adequate – locations without any facility or where no buffer is provided adjacent to high speed and high volume traffic. No crosswalks provided and long crossing distances at intersections. The absence of sidewalks and protected crossings on Promenade Circle shown in **Figure 3-27** justifies a PLOS “F” for the street.

Higher segment scores are characterized by locations where lower vehicle speeds, lower volumes, wider sidewalks, and larger boulevards with ample separation from moving traffic are present. Lower segment scores are observed in locations where high vehicle speeds, narrow sidewalks, and minimal separation from traffic are present.

Figure 3-27: Examples of Pedestrian Level of Service



LOS A: Lakeshore Rd and Orchard Rd, City of Mississauga



LOS D: New Westminster Drive north of Centre Street, City of Vaughan



LOS F: Promenade Circle south of E Promenade, City of Vaughan

Pedestrian LOS Analysis

The segment and intersection PLOS analysis results are summarized in **Table 3-7** and **Table 3-8** and illustrated in **Figure 3-28**.

Where new pedestrian facilities are being implemented as part of the Centre & Bathurst Street vivaNext project, the PLOS achieves higher scores. The wider sidewalks, treed boulevards and bike lanes mitigate the effect of incoming traffic and improve the walking experience along Centre Street and Bathurst Street. Moreover, Disera Drive and Atkinson Drive also perform well due to their wider sidewalks and streetside parking or equivalent buffer. Local residential streets have acceptable PLOS due to the low mandated speeds, lower vehicle (and pedestrian) traffic volumes which make their narrow sidewalks contextually appropriate. Where sidewalks are missing, an “F” score was assigned.

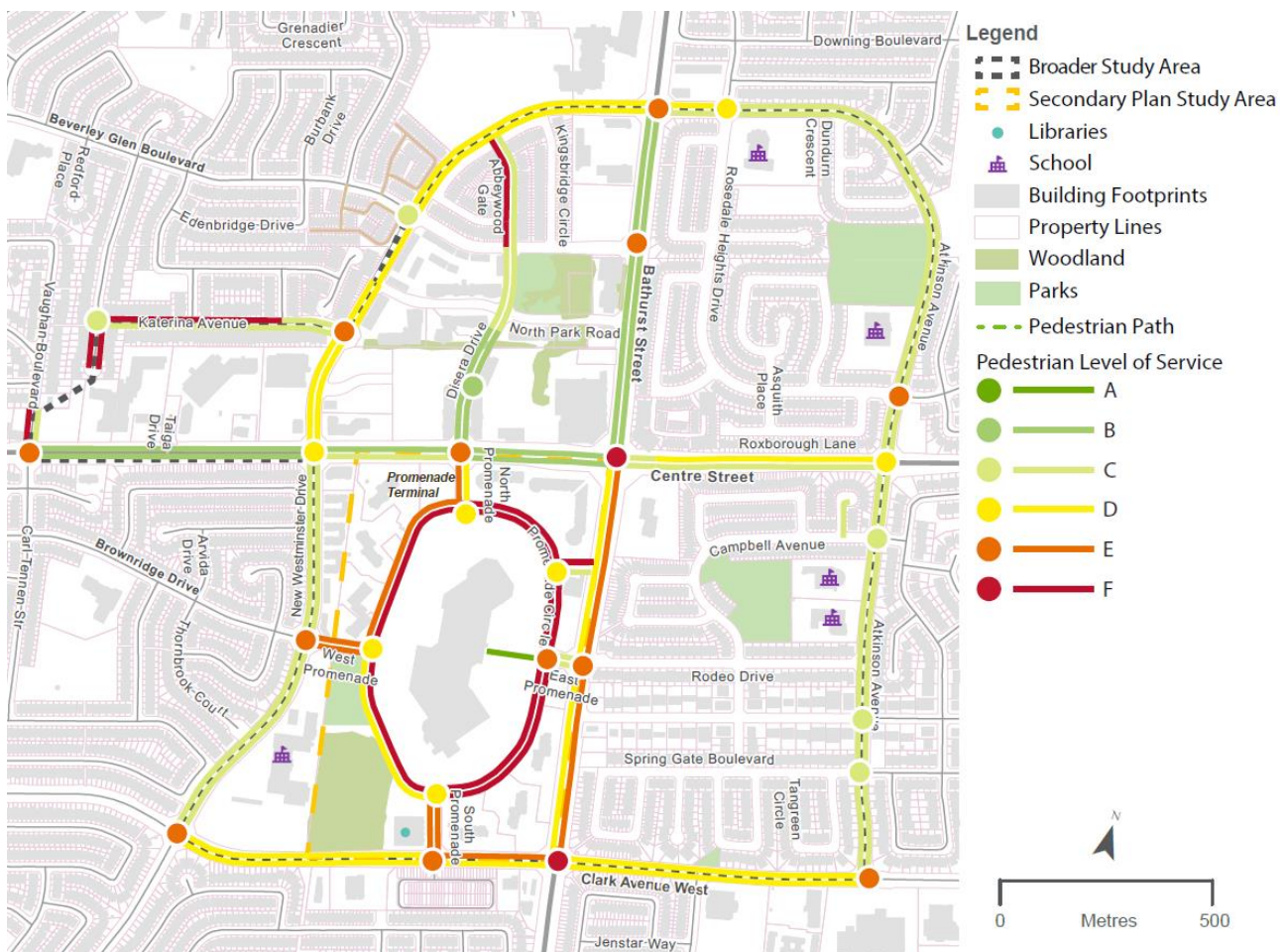
Elsewhere in the study area, the PLOS results have room for improvement. Sidewalks along Bathurst Street south of Centre Street are not wide or setback enough to compensate for the high speeds and volumes along the regional road. The missing sidewalks around

Promenade Circle form a disconnected network that impacts pedestrian access to Promenade Centre and result in a destination that is essentially inaccessible for walking.

The majority of intersections operate with a PLOS of 'D' or worse due to the wide cross-section nature of roads within the study area. The vivaNext project has added median refuges and coloured crosswalk markings but has introduced more lanes for pedestrians to cross, offsetting potential benefits. Moreover, large curb radii at collector roads facilitate quicker turns for vehicles, adversely impacting PLOS. Intersections at Promenade Circle have different shortcomings associated with their low PLOS scores; they are unsignalized, have faded or non-existent crosswalk marking and in some instances do not have corner curbs for pedestrians to seek refuge.

Detailed analysis for the Pedestrian LOS can be found in **Appendix C**.

Figure 3-28: Existing* PLOS Results



*Existing Conditions includes current construction (scheduled for completion by December 2019) of Highway 7 VivaNext Project with sidewalk improvements on Bathurst Street and Centre Street

Table 3-7: Segment PLOS

| Road | From | To | North Side / East Side | South Side / West Side |
|--|--|---|------------------------|------------------------|
| Clark Avenue | New Westminster Drive | South Promenade | D | D |
| | South Promenade | Bathurst Street | E | D |
| | Bathurst Street | Atkinson Avenue | D | D |
| New Westminster Drive | Clarke Avenue West | Centre Street | C | C |
| | Centre Street | Bathurst Street | D | D |
| Atkinson Avenue | Bathurst Street | Highcliffe Drive / Rosedale Heights | D | C |
| | Highcliffe Drive / Rosedale Heights | Karmin Education Centre (north access) | C | C |
| | Karmin Education Centre (north access) | Centre Street | C | C |
| | Centre Street | Clark Avenue West | C | C |
| Centre Street | Carl Tennen Street / Vaughan Boulevard | New Westminster Drive | A | A |
| | New Westminster Drive | North Promenade / Disera Drive | B | C |
| | North Promenade / Disera Drive | Bathurst Street | B | B |
| | Bathurst Street | 150m East of Bathurst | C | C |
| | 150m East of Bathurst | Atkinson Avenue | D | C |
| Bathurst Street | Clark Avenue West | East Promenade | E | D |
| | East Promenade | Centre Street | E | D |
| | Centre Street | Beverly Glen Boulevard | B | B |
| | Beverly Glen Boulevard | New Westminster Drive / Atkinson Avenue | B | B |
| Abbeywood Gate / Disera Drive / North Promenade | Kingsbridge Circle | Beverly Glen Boulevard | C | F |
| | Beverly Glen Boulevard | 50m south of North Park Road | C | C |
| | 50m south of North Park Road | Centre Street | B | B |
| | Centre Street | Promenade Circle | D | E |
| Promenade Circle | North Promenade | West Promenade | F | E |
| | West Promenade | South Promenade | F | D |
| | South Promenade | East Promenade | F | F |
| | East Promenade | North Promenade | F | F |
| | Bathurst Street | Promenade Circle | F | C |

| Road | From | To | North Side / East Side | South Side / West Side |
|--------------------------|-----------------------|-----------------------|------------------------|------------------------|
| West Promenade | New Westminster Drive | Promenade Circle | E | E |
| South Promenade | Clark Avenue West | Promenade Circle | E | E |
| East Promenade | Bathurst Street | Promenade Circle | C | C |
| Katerina Avenue | MacArthur Drive | Miriam Garden Way | F | C |
| | Miriam Garden Way | New Westminster Drive | C | C |
| Vaughan Boulevard | Centre Street | Lawrie Road | C | F |
| MacArthur Drive | Katerina Avenue | Cul-de-sac | F | F |

Table 3-8: Intersection PLOS

| Road | Intersection | Intersection PLOS |
|------------------------------|---|-------------------|
| Atkinson Avenue | Rosedale Heights / Edmund Seager Drive | E |
| | Centre Street | D |
| | Clark Avenue | E |
| | Highcliffe Drive / Rosedale Heights | D |
| | Manor Gate / Campbell Ave | C |
| | Arnold Avenue | C |
| | Spring Gate Boulevard | C |
| Bathurst Street | Clark Avenue | F |
| | Centre Street | F |
| | Beverly Glen Boulevard | E |
| | East Promenade | E |
| | New Westminster Drive / Atkinson Avenue | E |
| Centre Street | North Promenade / Disera Drive | E |
| | Carl Tennen Street / Vaughan Boulevard | E |
| Clark Avenue | South Promenade | E |
| | New Westminster Drive | E |
| Disera Drive | Unnamed Road | B |
| New Westminster Drive | West Promenade / Brownridge Dr | E |
| | Centre Street | D |
| | Beverly Glen Boulevard | C |

| Road | Intersection | Intersection PLOS |
|------------------|--------------------------------------|-------------------|
| | Katerina Avenue | E |
| Promenade Circle | North Promenade | D |
| | West Promenade | D |
| | South Promenade | D |
| | East Promenade | E |
| | Promenade Circle Northeastern access | D |
| Katerina Avenue | MacArthur Drive | C |

3.4.3 Walkshed Analysis to/from BRT Stops

Transit walkshed refers to the pedestrian catchment area of a transit facility. It is determined by the distance people are generally willing to walk to a transit stop, for example 500 m. The simplest way of measuring the walkshed of a transit facility is to include the entire area within a 500 m radius. However, this approach may include areas that are, in reality, not accessible to pedestrians (i.e. over a highway) or require longer walking distances due to barriers or irregular street patterns. An alternative method is to map the “true” linear walking distance from a transit facility using the existing street network accessible to pedestrians. Comparing the two methods can illustrate issues with connectivity and point to where new pedestrian links may be necessary.

Figure 3-29 to **Figure 3-32** illustrate the 500-metre radial and linear walking walkshed analysis for four transit stations: the future vivaNext BRT stations Disera-Promenade Station, Taiga Station and Atkinson Station, and the existing Promenade Transit Terminal. It is to be noted the results for Disera-Centre Station and Promenade Transit Terminal are similar due to the close proximity of these two transit stations. When comparing the radial and linear walkshed analysis, the linear walkshed meets the radial walkshed only when there is a straight line trip. However, there are many areas where the linear walkshed does not cover the same area as the radial walkshed. For Disera-Promenade Station and Promenade Transit Terminal, this includes the entire northern portion of Promenade Centre and the area along New Westminster Drive north of Katerina Avenue. For Taiga Station, this includes the retail plaza north of Centre Street and surrounding residential properties north of Katarina Avenue and south of Brownridge Drive. As a result, transit users are often required to cut through parking lots or other informal footpaths to reach their destination.

The walkshed analysis also illustrates the lack of walking connectivity across the big blocks and relates to the low street connectivity scores seen in **Section 3.3.1**. There is limited continuous east-west and north-south connection within the study area.

Figure 3-29: Walkshed Analysis from Disera-Promenade BRT Station



Figure 3-30: Walkshed Analysis from Promenade Terminal



Figure 3-31: Walkshed Analysis from Taiga BRT Station



Figure 3-32: Walkshed Analysis from Atkinson BRT Station



3.4.4 Walk Score

Walk Score is a website that provides a number between 0 to 100 that measures the walkability of any address. It measures the potential for walking trips, and points are awarded based on the distance to amenities. The description of different walk score ranges is shown in **Table 3-9**. Similarly, Transit Score and Bike Score measures how well a location is served by public transit and whether an area is good for biking.

Walk Score analyzes hundreds of walking routes to nearby amenities. Points are awarded based on the distance to amenities in each category. Amenities within a 5 minute walk (.25 miles or 400 metres) are given maximum points. A decay function is used to give points to more distant amenities, with no points given after a 30 minute walk.

Walk Score also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density based on data sources include Google, Factual, Great Schools, Open Street Map.

To calculate a Transit Score, a "usefulness" value is assigned to nearby transit routes based on the frequency, type of route (rail, bus, etc.), and distance to the nearest stop on the route. The "usefulness" of all nearby routes is summed and normalized to a score between 0 - 100. To determine a Bike Score for a given location, calculations are made by measuring bike infrastructure (lanes, trails, etc.), hills, destinations and road connectivity, and the number of bike commuters.

Walk Score, Transit Score, and Bike Score are evaluated for Promenade Centre (1 Promenade Circle). The results are summarized in **Table 3-10**. Although the area is not well served with sidewalks and lacks a connective network, the large variety of retail uses results in a "somewhat walkable" score. This indicates that there is strong potential in the study area to facilitate more walking, with a finer-grid street network and improved pedestrian facilities. Although there is no dedicated cycling facilities in the study area, it received a bike score of 56 (bikeable), likely due to the large variety of retail uses in the area. With transit operating on major arterials bounding the study area, the area received a "good transit" score, although as mentioned in **Section 2.2.4**, the vivaNEXT project will bring major transit improvements to the study area.

Table 3-9: Walk Score Description

| Walk Score® | Description |
|-------------|---|
| 90-100 | Walker’s Paradise: daily errands do not require a car |
| 70-89 | Very Walkable: most errands can be accomplished on foot |
| 50-69 | Somewhat Walkable: some amenities within walking distance |
| 25-49 | Car-Dependent: a few amenities within walking distance |
| 0-24 | Car-Dependent: almost all errands require a car |

Source: WalkScore

Table 3-10: Walk Score, Transit Score, and Bike Score for Promenade Mall (1 Promenade Circle)

| Measure | Score | Description |
|---------------|-------|---|
| Walk Score | 77 | Very Walkable Most errands can be accomplished on foot. |
| Transit Score | 53 | Good Transit Many nearby public transportation options. |
| Bike Score | 56 | Bikeable |

Source: WalkScore

3.5 Cyclists

3.5.1 Existing Cycling Network

There are no dedicated cycling facilities within the transportation study area (**Figure 3-21**). Brownridge Drive west of New Westminster Drive is designated as a signed shared roadway; however no pavement markings or physical barriers provide protection to cyclists. Beverly Glen Boulevard just to the northwest of the transportation study area is also a signed shared roadway, but does not provide connectivity into the study area. There are also a number of pathways throughout the study area that may currently be used by cyclists but are not suitable or intended for their use due to a lack of connectivity, wayfinding or other signage. This study will consider improvements to these pathways to improve suitability for cycling where needed, and will also consider providing connections to existing cycling routes that terminate at the study area boundary.

The Bathurst Street and Centre Street vivaNext project, which is currently under construction, will introduce raised cycle tracks on Bathurst Street north of Centre Street and on Centre Street West of Bathurst Street. Two-stage left-turn bike boxes are also planned at intersections to facilitate crossing for cyclists. As mentioned in **Section 2.4.9**, a response for proposal for consulting engineering services for Clark Avenue West Cycling Facilities and Road Rehabilitation was issued in March 2019, and the type of cycling facility will be further confirmed.

Moreover, as mentioned in **Section 2.4.9**, curb side raised and separated cycle tracks are planned for both sides of Clark Avenue West. The study team is in the process of confirming the preferred design solution. Construction is set for completion in late 2020.

3.5.2 Bicycle Level of Service

Bicycle LOS Methodology

The methodology for the bicycle level of service (BLOS) is based on the York Region Transportation Mobility Plan and enhanced by the City of Ottawa's Multimodal Analysis Guideline. BLOS is calculated at the intersection and mid-block (segment) in recognition that a cyclist's experience is determined by the conditions both between crossings and at the crossing itself.

The base criteria in the York Region and Ottawa evaluation are similar for the most part, but the BLOS analysis is more detailed under the Ottawa methodology, which considers not only the type and width of bikeway but also the adjacent road characteristics such as road and vehicular speeds. The differences between the Ottawa and York Region level of service approaches are most pronounced when reviewing the methodologies at the intersection level. The Ottawa methodology calls for a more involved list of inputs, including road-way characteristics such as the presence of turning lanes and turning speeds lead to a more rigorous evaluation of conditions at intersections. The Ottawa methodology offers a more detailed review of the user experience, especially at the intersection level. Overall, the York Region Transportation Mobility Plan multi-modal level of service methodology is a good baseline from which to conduct an existing conditions review. Nevertheless, the Ottawa methodology sets a higher level of standard that is arguably more appropriate for urbanizing areas that aim to prioritize active transportation.

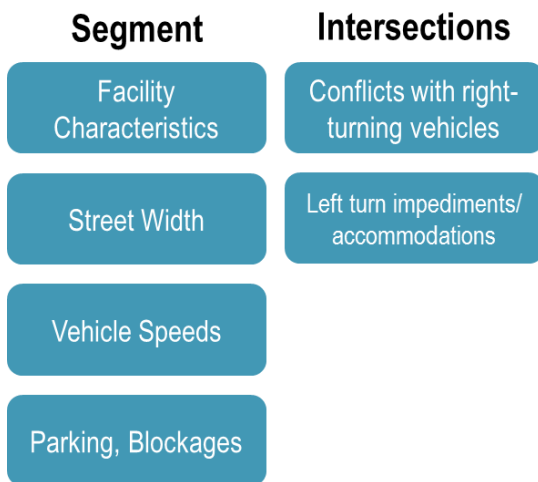
The segment BLOS evaluation utilizes a look-up table approach based on roadway characteristics and facility type and quality. The score is influenced by factors such as facility type, street width, operating speed, and parking characteristics.

For intersection BLOS, a similar look-up table approach is used to evaluate the left and right-turning conditions for cyclists at the intersection. Intersection BLOS is affected by turning and operating speeds, dual turning lanes and bike boxes. Other impediments to cyclists seeking to turn right or left (such as right-turn lane length and crossing distances) are also assessed. The average score of all approaches (north, south, west and east) is then used to determine the overall intersection BLOS.

Details of the methodology can be found in **Appendix B**.

The input of the BLOS is shown in **Figure 3-33**.

Figure 3-33: Inputs for Bicycle LOS



Segment BLOS is the most sensitive to facility type, with physically separated bikeways such as cycle tracks, protected bike lanes and multi-use paths receiving a score of 'A' while cycling in mixed traffic conditions with varying operating speeds and street widths generally scoring lower – 'D' to 'F'. The scoring ranges as follows:

- **BLOS 'A' to 'C'** – Physically separated facilities such as cycle tracks, protected bike lanes, and multi-use paths (MUP) are attractive to most cyclists. At intersections, continuous cycling facilities are provided and separated from vehicles and pedestrians. The Martin Goodman Trail depicted in **Figure 3-34** receives a BLOS "A" as it is physically separated from vehicles by a curb along with a wide grass boulevard acting as a buffer.
- **BLOS 'D' to 'E'** – Designated bike lanes adjacent to high speed traffic lanes or shared facilities on low volume, low speed streets with wide curb lanes provide some comfort, but the majority of potential cyclists typically will not cycle. Greater conflicts at intersections with turning vehicles are experienced. An example of a BLOS "D" can be observed **Figure 3-34**. Cyclists on Disera Drive north of Centre Street have to ride in mixed traffic on a street with a 4 to 5 lane cross-section (including on-street parking) but slower adjacent vehicle speeds.

- **BLOS 'F** – Non-separated, shared roadways with high traffic volumes and speeds, and no accommodations at intersections. Bathurst Street south of Centre Street shown in **Figure 3-34** exhibits the lowest BLOS possible due to the unsafe cycling conditions resulting from high volume, high speed, and wide cross-section roadways.

Figure 3-34: Example of Bicycle LOS



Bicycle LOS Analysis

The BLOS results of the study area are illustrated in **Figure 3-35**, and the segment and intersection BLOS are summarized in **Table 3-11** and **Table 3-12**. It is noted that the BLOS on Centre Street and Bathurst Street are based on construction documents, reflecting conditions once the construction is completed. The proposed curb side raised and separated cycle tracks on Clark Avenue was not included in the analysis, as the City is in the process of confirming the preferred design solution.

The scores vary widely across the study area. Where dedicated cycling facilities are in the works, high segment BLOS scores are achieved, namely for Bathurst Street north of Centre Street and on Centre Street West of Bathurst Street. Set to be completed by end of 2019,

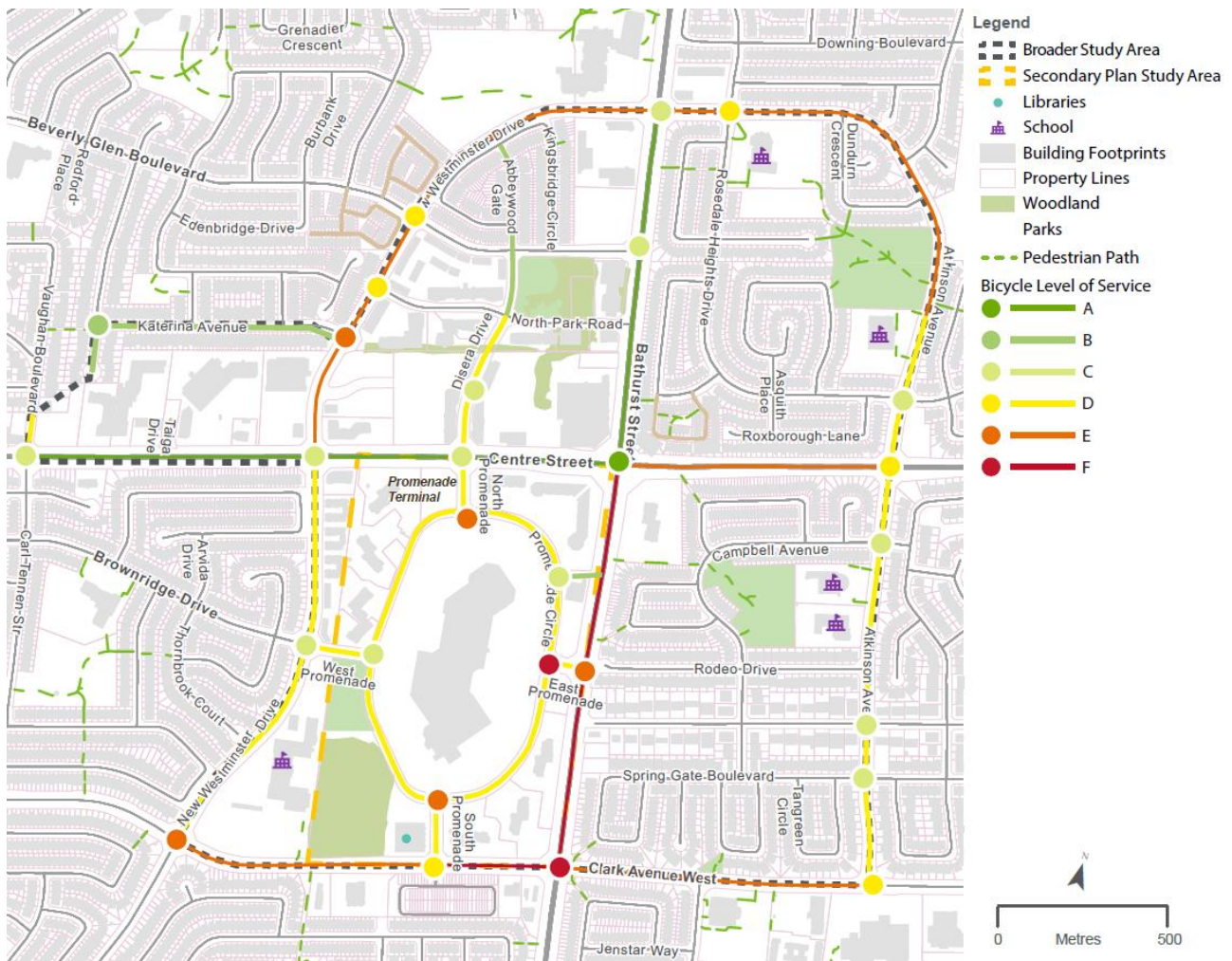
the vivaNext project will introduce raised, 2.0 m wide bike lanes which will be separated from the roadway by 0.9 m buffers. These design choices help mitigate the adverse effects of wide roadways and high speeds on cyclists, thus improving BLOS. At the intersection level, the two-stage left-turn bike boxes will increase cyclist visibility and facilitate safer crossing.

In locations with no cycling infrastructure, segment BLOS is especially determined by cross-sectional characteristics and operating conditions, tending to the worse the wider the roadway and the higher the speeds. Therefore, Bathurst Street south of Centre Street witnesses a BLOS 'F' while local residential streets such as Abbeywood Gate and Katerina Avenue receive a 'B'. The results are intuitive; biking in shared conditions along a quieter, narrower street is less dangerous, more pleasant and more likely to occur than on a busier, wider, hostile one.

At Promenade Circle, the 30 km/hr posted speed limit and modest four lane cross-section helps explain the segment BLOS of D. However, the lack of signalization at intersections along Promenade Circle adversely impacts a cyclist's experience by removing any indication and certainty for when turns can be completed safely.

Detailed analysis can be found in **Appendix C**.

Figure 3-35: Existing* Bicycle LOS



*Existing Conditions includes current construction (scheduled for completion by December 2019) of Highway 7 VivaNext Project with dedicated cycle tracks on Bathurst Street and Centre Street. The LOS analysis does not include the proposed future curb side raised and separated cycle track on Clark as the City is in the process of confirming the preferred design solution.

Table 3-11: Segment BLOS

| Road | From | To | Segment BLOS |
|-----------------------|--|--|--------------|
| Clark Avenue | New Westminster Drive | South Promenade | E |
| | South Promenade | Bathurst Street | F |
| | Bathurst Street | Atkinson Avenue | E |
| New Westminster Drive | Clark Avenue West | Centre Street | D |
| | Centre Street | Bathurst Street | E |
| Atkinson Avenue | Bathurst Street | Highcliffe Drive / Rosedale Heights | E |
| | Highcliffe Drive / Rosedale Heights | Karmin Education Centre (north access) | E |
| | Karmin Education Centre (north access) | Centre Street | D |
| | Centre Street | Clark Avenue West | D |

| Road | From | To | Segment BLOS |
|--|--|---|--------------|
| Centre Street | Carl Tennen Street / Vaughan Boulevard | New Westminster Drive | A |
| | New Westminster Drive | North Promenade / Disera Drive | A |
| | North Promenade / Disera Drive | Bathurst Street | A |
| | Bathurst Street | Atkinson Avenue | E |
| Bathurst Street | Clark Avenue West | East Promenade | F |
| | East Promenade | Centre Street | F |
| | Centre Street | Beverly Glen Boulevard | A |
| | Beverly Glen Boulevard | New Westminster Drive / Atkinson Avenue | A |
| Abbeywood Gate / Disera Drive / North Promenade | Kingsbridge Circle | Beverly Glen Boulevard | B |
| | Beverly Glen Boulevard | North Park Road | B |
| | North Park Road | Centre Street | D |
| | Centre Street | Promenade Circle | D |
| | Promenade Circle | Promenade Circle | B |
| Promenade Circle | North Promenade | West Promenade | D |
| | West Promenade | South Promenade | D |
| | South Promenade | East Promenade | D |
| | East Promenade | North Promenade | D |
| West Promenade | New Westminster Drive | Promenade Circle | D |
| South Promenade | Clark Avenue West | Promenade Circle | D |
| East Promenade | Bathurst Street | Promenade Circle | D |
| Katerina Avenue | MacArthur Drive | New Westminster Drive | B |
| MacArthur Drive | Katerina Avenue | Cul-de-sac | B |

Table 3-12: Intersection BLOS

| Road | Intersection | Intersection BLOS |
|------------------------------|---|-------------------|
| Atkinson Avenue | Rosedale Heights / Edmund Seager Drive | E |
| | Centre Street | D |
| | Clark Avenue | E |
| | Highcliffe Drive / Rosedale Heights | D |
| | Manor Gate / Campbell Ave | C |
| | Arnold Avenue | C |
| | Spring Gate Boulevard | C |
| Bathurst Street | Clark Avenue | F |
| | Centre Street | F |
| | Beverly Glen Boulevard | E |
| | East Promenade | E |
| | New Westminster Drive / Atkinson Avenue | E |
| Centre Street | North Promenade / Disera Drive | E |
| | Carl Tennen Street / Vaughan Boulevard | C |
| Clark Avenue | South Promenade | E |
| | New Westminster Drive | E |
| Disera Drive | Unnamed Road (north of Centre Street) | B |
| New Westminster Drive | West Promenade / Brownridge Dr | E |
| | Centre Street | D |
| | Beverly Glen Boulevard | C |
| | Katerina Avenue | E |
| Promenade Circle | North Promenade | D |
| | West Promenade | D |
| | South Promenade | D |
| | East Promenade | E |
| | Promenade Circle Northeastern access | D |
| MacArthur Drive | Katerina Avenue | B |

3.6 Transit

3.6.1 Existing Transit Network

The existing public transit network within the Study Area is shown in **Figure 3-36** and includes:

- York Region Transit (YRT) Viva bus rapid transit (Viva Orange);
- YRT local bus service (YRT Route 3, 5, 23, 77, and 88);
- Toronto Transit Commission (TTC) local bus service (TTC Route 160).

Viva Orange provides service between Martin Grove Road and Richmond Hill Centre Terminal, generally travelling along Highway 7, except through the study area where it follows Centre Street and Bathurst Street, stopping at Promenade Terminal and Bathurst / Atkinson. Dedicated bus rapidways are currently used by Viva services on most of Highway 7 and will soon be operational on Bathurst Street and Centre Street within the study area, with stations at Taiga, Disera-Promenade, and Atkinson.

YRT local routes provide service on New Westminster Drive, Bathurst Street, Atkinson Avenue, Centre Street, and Clark Avenue West. All YRT routes shown in **Figure 3-36** except Route 5 Clark connect at the Promenade Terminal. In addition, TTC Route 160 goes north on Bathurst Street and also connects to the Promenade Terminal. It then completes a clockwise loop via West Promenade, New Westminster Drive, Atkinson Avenue, and Clark Avenue West, prior to routing south on Bathurst Street.

Approximate service frequency and the hours of operations for weekdays and weekends are shown in **Table 3-13**. The area is generally well-served by transit – all points in the Transportation Study area are a 450 metre or less walk from at least two transit routes, with connections available to three TTC subway stations and a variety of destinations across York Region.

On weekdays, all lines operate throughout the day. Several routes provide service from 5:00 AM or earlier until midnight or later. Viva Orange provides regular service every 20 minutes or better on weekdays and weekends. Route 77 operates from 4:00 AM to 3:00 AM from Monday to Friday, until 3:30 AM on Saturday and until 3:00 AM on Sunday.

Peak period frequencies for all routes range between every 15 and 35 minutes. Most routes operate with headways greater than 20 minutes during off-peak hours. These frequencies, particularly during off-peak periods, require users to plan their departure in advance to avoid long waits which discourages spontaneous trips. More frequent service on key routes should facilitate a modal shift towards transit for medium to long-distance trips, and should be considered in later stages of the study.

Figure 3-36: Existing Transit Network



Table 3-13: Approximate Transit Service Frequency and Service Hours

| Transit Agency | Route # | Route Name | From | To | Weekday | | | Weekends / Holidays | |
|----------------|-------------|-----------------|----------------------------|-------------------------------|---------------------------------------|------------------------|-------------------|---------------------|--|
| | | | | | PM Peak Period (3-7 pm) Headway (min) | Off-peak Headway (min) | Service Hours | Headway (min) | Service Hours |
| YRT | 3 | Thornhill | Steeles Ave & Don Mills Rd | Pioneer Village Terminal | 35 | 45 | 5 am - 1 am | 45 | 8:30 am – 10 pm (Sat) 10 am – 9:45 pm (Sun) |
| YRT | 5 | Clark | Finch Terminal | Glen Shields | 15 | 30 | 5:30 am – 11 pm | 30 | 7 am – 8 pm (Sat) |
| YRT | 23 | Thornhill Woods | Finch Terminal | Teston Rd & Via Romano Blvd. | 30 | 60 | 6 am -10 pm | - | - |
| YRT | 77 | Highway 7 | Finch Terminal | Highway 50 | 15 | 15-30 | 4 am – 3 am | 45 | 5 am – 3:30 am (Sat) 8:30 am – 3 am (Sun) |
| YRT | 88 | Bathurst | Finch Terminal | Seneca College King Campus | 15 | 15-30 | 5:15 am – 12 am | 30 | 6:30 am – 11:30 pm (Sat) 7 am – 9:30 pm (Sun) |
| TTC | 160 | Bathurst North | Wilson Station | Centre Street | 30 | 30 | 6 am – 10 pm | 35 | 5:45 am – 6:30 pm (Sat) 8:50 am – 6:30 pm (Sun) |
| YRT | Viva Orange | | Martin Grove Rd & Hwy 7 | Richmond Hill Centre Terminal | 15 | 20 | 4:15 am – 1:30 am | 20 | 5 am – 1 am (Sat) 6:45 am – 12:30 am (Sun) |

* Headway measured at a timing point within the study area
Source: YRT and TTC transit service schedule (July 2019)

3.7 Vehicles Traffic

This section is a summary of the traffic analysis that has been completed for the Existing conditions.

A detailed analysis memo, with performance results for all intersection movements is included in **Appendix E**. This appendix also includes signal timing sheets, drawings for the planned changes on Centre and Bathurst Streets due to the Viva Orange BRT route that is under construction, and detailed Synchro print out results for both horizons and all peak hours.

3.7.1 Data Sources

Existing traffic operations were assessed using turning movement count (TMC) data and existing signal timing plans provided to HDR by the City of Vaughan, and from counts conducted by HDR. Some of the traffic counts were conducted during of the vivaNEXT construction, specifically on Centre Street west of Bathurst Street and Bathurst Street north of Centre Street. These counts were adjusted and balanced to match the counts that were conducted during the time period prior to the construction.

A summary of the study area intersections and the traffic count dates is provided in **Table 3-14**. All of these intersections were analyzed in the traffic analysis.

Table 3-14: Turning Movement Count Dates

| Intersection | Weekday AM / PM Count Date | Weekend Peak Hour Count Date |
|--|------------------------------|------------------------------|
| New Westminster Drive & Bathurst Street | Tuesday, May 28, 2019 | Saturday, September 14, 2019 |
| Atkinson Avenue & Highcliffe Drive | Tuesday, May 28, 2019 | |
| Beverly Glen Boulevard & New Westminster Drive | Tuesday, May 28, 2019 | |
| Beverly Glen Boulevard & Bathurst Street | Wednesday, June 26, 2019 | |
| New West Minster & No Frills East Access | Thursday, September 12, 2019 | |
| Smart Centres Access & Disera Drive | Thursday, September 12, 2019 | |
| Bathurst & SmartCentres East Access | Thursday, September 12, 2019 | |
| Edmond Seager Drive & Atkinson Avenue | Tuesday, May 28, 2019 | |
| Centre Street & Vaughan Boulevard | Wednesday, May 29, 2019 | |
| Centre Street & Taiga Drive | Thursday, September 12, 2019 | |
| Centre Street & New Westminster Drive | Wednesday, May 29, 2019 | |
| Centre Street & York Region Transit Access | Thursday, January 25, 2018 | |
| Centre Street & North Promenade | Thursday, June 13, 2019 | |
| Centre & Promenade Village Access | Thursday, January 25, 2018 | |

| Intersection | Weekday AM / PM Count Date | Weekend Peak Hour Count Date |
|---|----------------------------|------------------------------|
| Centre Street & Bathurst Street | Wednesday, June 26, 2019 | |
| Centre Street & Atkinson Avenue | Tuesday, May 28, 2019 | |
| West Promenade & New Westminster Drive | Wednesday, May 29, 2019 | |
| Bathurst Street & Promenade Circle | Thursday, June 13, 2019 | |
| East Promenade & Bathurst Street | Wednesday, May 29, 2019 | |
| Bathurst Street & SE Apartment Access | Thursday, January 25, 2018 | |
| Campbell Avenue & Atkinson Avenue | Thursday, May 30, 2019 | |
| Arnold Avenue & Atkinson Avenue | Thursday, May 30, 2019 | |
| Spring Gate Boulevard & Atkinson Avenue | Tuesday, May 28, 2019 | |
| Clark Avenue & New Westminster Drive | Thursday, January 25, 2018 | |
| Clark Avenue & South Promenade | Thursday, January 25, 2018 | Saturday, September 14, 2019 |
| Clark & SE Apartment Access | Thursday, January 25, 2018 | |
| Clark Avenue & Bathurst Street | Wednesday, May 29, 2019 | |
| Clark Avenue & York Hill Boulevard | Tuesday, June 6, 2017 | |
| Clark Avenue & Atkinson Avenue | Tuesday, June 6, 2017 | |
| N Promenade and Promenade Circle | Friday, November 20, 2015 | |
| W Promenade and Promenade Circle | Friday, November 20, 2015 | |
| E Promenade and Promenade Circle | Friday, November 20, 2015 | |
| S Promenade and Promenade Circle | Friday, November 20, 2015 | |
| Promenade Circle and Promenade Circle | Thursday, January 25, 2018 | |

3.7.2 Intersection Analysis Methodology

The analysis was conducted using Synchro 9, and considered three separate measures of performance:

- The volume to capacity (v/c) ratio for each movement. This ratio reflects peak hour traffic demand measured against roadway capacity;
- The level of service (LOS) for each for each movement and overall intersection. LOS is based on the average control delay per vehicle; and
- The 50th and 95th percentile queue length (measured in 7.2m vehicle lengths) of each movement/lane group.

LOS definitions are shown in **Table 3-15** and are based on the Highway Capacity Manual (HCM) 2010. The HCM defines LOS for signalized and unsignalized

intersections as a function of the average vehicle control delay. LOS may be calculated per movement or per approach for any intersection configuration, but LOS for the intersection as a whole is only defined for signalized and all-way stop configurations.

Table 3-15: Highway Capacity Manual Level of Service Definitions for Intersections

| LOS | Signalized Intersection Average Vehicle Control Delay | Unsignalized Intersection Average Vehicle Control Delay | LOS Recommendation |
|-----|---|---|--|
| A | ≤10 sec | ≤10 sec | Acceptable |
| B | 10-20 sec | 10-15 sec | |
| C | 20-35 sec | 15-25 sec | |
| D | 35-55 sec | 25-35 sec | Delays are more perceptible |
| E | 55-80 sec | 35-50 sec | Notable delays but may be acceptable in urban contexts |
| F | ≥80 sec | ≥50 sec | |

It is noted that the analysis may indicate that certain movements at an intersection operate with volume-capacity ratios greater than 1.00. Theoretically, a maximum volume-capacity ratio for existing conditions cannot be greater than 1.00, since the observed volumes used in the analysis represent volumes that were actually processed at the intersection. Thus, a volume-capacity ratio exceeding 1.00 under existing conditions is a result of conservative parameters used in the Synchro analysis. For future conditions, v/c ratios exceeding 1.00 may either be a result of these conservative parameters, but may also indicate a likelihood that traffic will divert to other routes. Volume inputs in Synchro are static and any diversion would have to be manually accounted for and assigned to different intersections.

On the other hand, LOS F indicates average delays in excess of 80 seconds for signalized intersections. While this is generally characterized as “poor” operation, it does not necessarily imply that the movement, approach, or intersection is experiencing demand in excess of capacity. When cycle lengths are in the range of 120 seconds (or longer), it is possible to have delays in the range of 80 seconds even in low-demand situations.

In addition to v/c ratio and LOS, 50th and 95th percentile queue lengths (presented in vehicle lengths, based on 7.2m per vehicle [HCM 2010 default]) are also reported to identify any storage length deficiencies.

3.7.3 Existing Traffic Operations

Existing traffic volumes were assembled and balanced to represent “typical” existing conditions. Traffic volumes at adjacent intersections were balanced if the volumes were different by more than 10% (except if there were significant accesses / driveways in between), and intersections that were counted during construction periods were balanced up to match typical conditions.

Existing laning and signal timing were used at all intersections, except for the portion of Centre Street west of Bathurst Street, and the portion of Bathurst Street north of Centre. For these street segments, and the intersection of both streets, future laning and signal timing were used to take into consideration the imminent implementation of the Viva Orange BRT. The primary differences in laning and signal timing include median BRT lanes, the replacement of dedicated right turn lanes with shared through/rights, and a dedicated BRT phase at the intersection of Centre and Bathurst Street.

The parameters that exceed the performance thresholds (i.e., critical turning movements) have been highlighted, based on the metrics shown in the **Table 3-16** below.

Table 3-16: Performance Thresholds for Critical Turning Movements*

| Metric | Threshold |
|--|--|
| LOS | E or F |
| v/c | > 0.90 |
| 50 th / 95 th Percentile Queue | Queue greater than available storage length (presented in # number of vehicle lengths) |

* The performance thresholds for Critical Turning Movements are based on City of Vaughan TIS Guidelines (April 2018)

As noted earlier, the reported results are based on HCM 2010 methodology. However this methodology cannot be applied to certain intersection types (such as those that have exclusive hold phases or non-NEMA phasing) and the results for the following intersections is based on Synchro methodology (which is similar to HCM 2000):

- Bathurst Street & Centre Street (Signalized)
- Bathurst Street & East Promenade (Signalized)
- Promenade Circle & East Promenade (Un-signalized)
- Promenade Circle & South Promenade (Un-signalized)

Traffic volumes used to assess existing traffic conditions can be seen in **Figure 3-37**. Critical turning movement and intersection LOS are also illustrated in **Figure 3-38** through **Figure 3-40**. The complete intersection results are included in **Appendix E**.

Figure 3-37. Existing Traffic Volumes Diagram

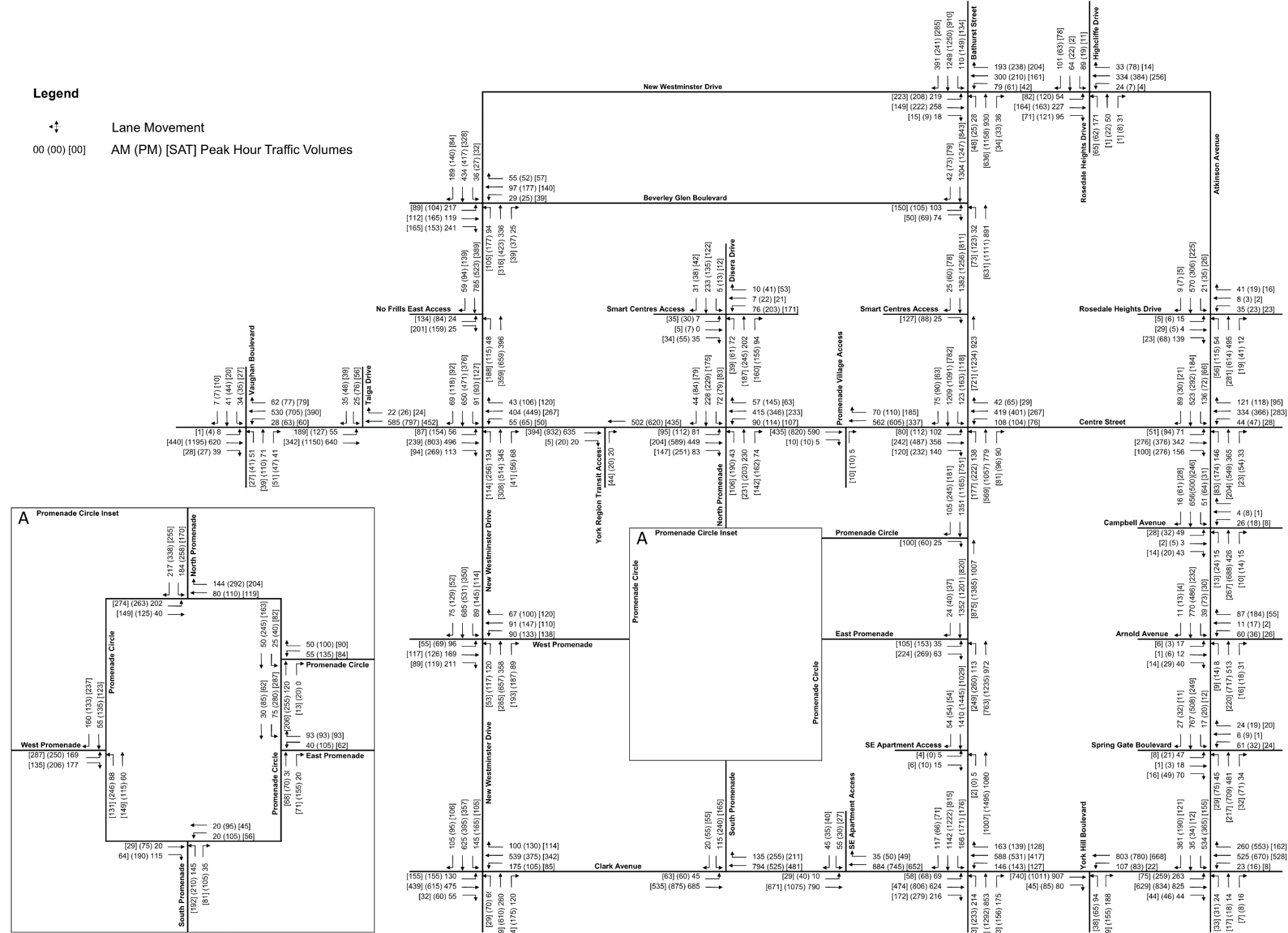


Figure 3-38: Existing AM Peak Hour - Intersection and Critical Movement LOS



Figure 3-39: Existing PM Peak Hour - Intersection and Critical Movement LOS



Figure 3-40: Existing Weekend Peak Hour - Intersection and Critical Movement LOS



Existing Traffic Operations Summary

There are a number of movements and intersections that exceed the performance thresholds. Intersections with movements that exceed the v/c and LOS thresholds are listed below:

- New Westminster Drive & Bathurst Street
- Bathurst Street & Beverly Glen Boulevard
- Carl Tennen Street / Vaughan Boulevard & Centre Street
- Centre Street & No Frills Access
- New Westminster Drive & Centre Street
- North Promenade / Disera Drive & Centre Street
- Bathurst Street & Centre Street
- Atkinson Avenue & Centre Street
- Bathurst Street & East Promenade

- Bathurst Street & Clark Avenue
- Clark Avenue & Atkinson Avenue
- New Westminster Drive & No Frills Est Access
- Clark Avenue & SE Apartment Access

The following intersections operate within the v/c and LOS thresholds, but have queues that exceed the available storage during one of the peak hours:

- Atkinson Avenue & Highcliffe Drive / Rosedale Heights
- New Westminster Drive & Beverley Glen Boulevard
- Disera Drive & Smart Centres Access
- New Westminster Drive & Brownridge Drive / West Promenade
- New Westminster Drive & Clark Avenue
- Clark Avenue & York Hill Boulevard

Existing SimTraffic Analysis Summary

SimTraffic is a micro-simulation add-on to Synchro, and select corridor performance was analyzed in SimTraffic to better understand coordination and progression dynamics between intersections along the major corridors. A total of five, 60 minute runs were completed for each peak period, with a 10 minute seeding time. SimTraffic analysis was conducted for Centre Street and Bathurst Street. Based on the results, and a visual inspection of the SimTraffic analysis, the following is a summary of the existing horizon corridor review:

Overall

- The varied cycle length and operation (due to future BRT preemption) at Centre Street and Bathurst Street is inconsistent with the signal timing regimes on the Centre Street (130s cycle lengths) and Bathurst Street corridors (140s cycle lengths), and limits the opportunity for consistent coordination

Centre Street

- Eastbound travel speeds are hampered by less than optimal coordination between Vaughan Boulevard and New Westminster Drive.
- Westbound progression generally operates well on the segment west of Bathurst Street

Bathurst Street

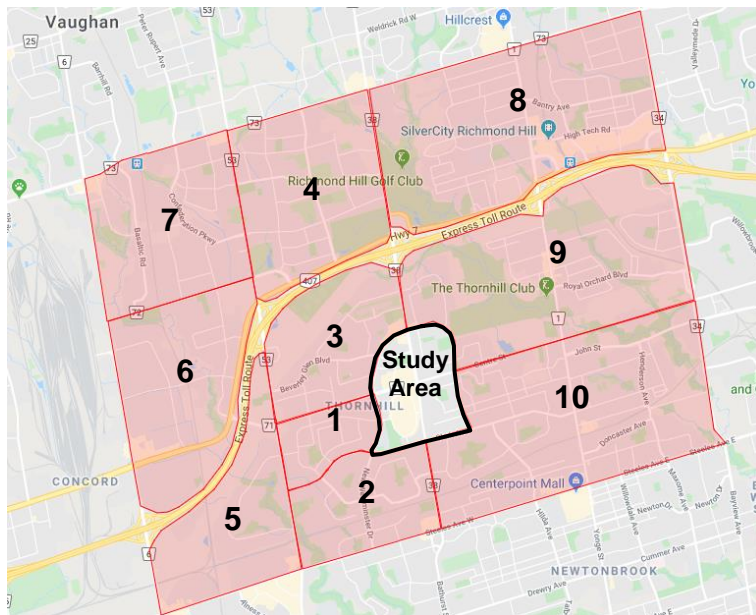
- Southbound travel is inhibited at Centre Street due to a lack of southbound through capacity (AM), and this is clearly shown by the low travel speeds at the intersection
- Progression north of Centre Street is generally good (both directions), while progression south of Centre Street could be improved

3.8 Traffic Infiltration

Traffic infiltration on local streets is usually caused by heavy traffic and congestion on nearby arterial or collector roads which pushes traffic to find alternative routes. The prevalent use of real-time traffic navigation applications such as Google Maps and Waze⁷ can also play a role in diverting drivers from the main road to side streets in order to avoid traffic. Traffic infiltration leads to high traffic volumes on local streets and can raise safety concerns due to the high speed from vehicles cutting through local neighbourhoods.

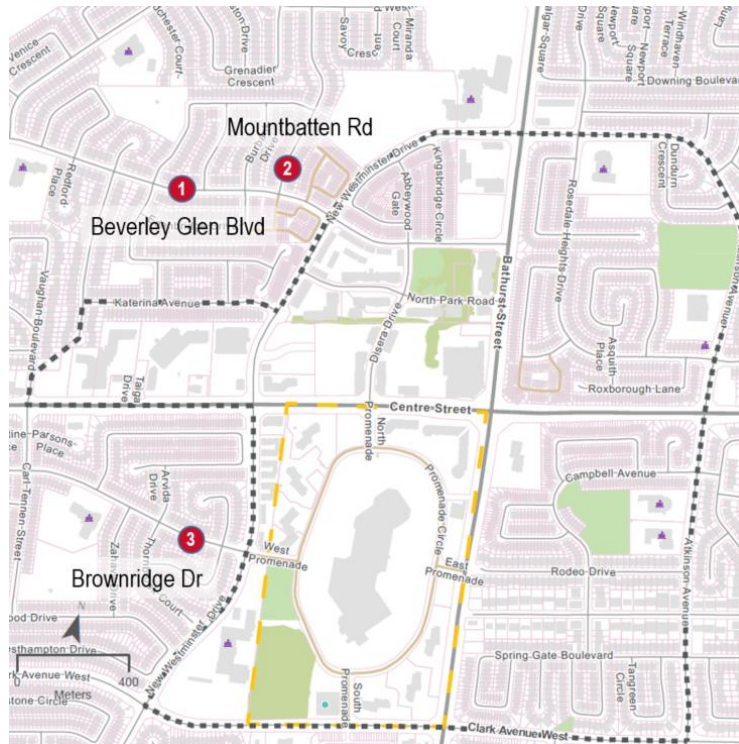
To understand the current levels of traffic which cuts through the residential neighbourhoods (i.e. traffic infiltration) adjacent to the Promenade Centre Secondary Plan study area, a traffic infiltration analysis was conducted using Streetlight Origin-Destination (OD) data. **Figure 3-41** illustrate the ten (10) residential areas considered, and **Figure 3-42** illustrates the cut-through streets considered, which includes Beverley Glen Boulevard, Mountbatten Road, and Brownridge Drive. The reasons for the selection of these locations and the use of the ten zones are discussed in the next section.

Figure 3-41: Cut-Through Study on Residential Area



⁷ It has been reported that Google Maps or Waze can direct drivers from main roads to quieter side streets to avoid traffic, raising concerns from local residents. <https://trnto.com/is-the-waze-map-directing-an-unsafe-number-of-cars-onto-quiet-neighbourhood-streets/>

Figure 3-42: Traffic Infiltration Analysis Locations



3.8.1 Methodology

StreetLight Data was used to conduct an analyses to determine if select residential streets are being used as cut-through routes. StreetLight Data is based on Big Data that is created by mobile phones, GPS devices, connected cars, commercial trucks, fitness trackers, among other location tracking devices. It allows users to create custom data extractions by identifying origin/destination zones and pass-through zones (middle filters) to identify the amount of infiltration that occurs through the residential streets. Data extracted was based on daily averages from June 2016 to May 2017, from Monday to Thursday during the AM and PM peak hours (8 to 9 AM and 4 to 5 PM), and Saturday from 1 to 2 PM. Data from 2016/2017 was utilized as this time frame represent normal traffic conditions (pre-construction of Centre and Bathurst Street).

A review of the transportation network was undertaken and three (3) streets within the residential neighbourhoods adjacent to the study area were selected for analysis. Beverley Glen Boulevard and Brownridge Drive are Minor Collectors and were selected as proxy cut-through streets due to their proximity and direct connectivity to the study area. Mountbatten Road is a Local Road and was selected as a proxy cut-through street to capture potential infiltration from trips originating/destined to the residential neighbourhoods to the north of the study area. It was assumed that all three streets may be used to as a cut-through option to avoid congestion along the major arterials and intersections.

Both Beverley Glen Boulevard and Brownridge Drive are considered Minor Collector streets. City of Vaughan's Official Plan, Policy 4.2.1.20, indicates collector streets are for

short to medium distance trips within the City in order to support and augment the capacity of arterial street network. Access to collector streets from abutting properties is permitted and controlled. Further, Policy 4.2.1.21 indicates Minor Collector streets shall generally have a maximum of two travel lanes and projected traffic volumes shall be less than 500 vehicles in the peak hour. Traffic data indicates that these roads have greater than 500 vehicles during the peak hours as summarized in **Table 3-17**. It is likely that traffic from outside these residential areas are using these streets as cut-through routes. It is noted that traffic data was not available for Mountbatten Road.

Table 3-17: Traffic Count Data (May 2019)

| Intersection | Count Date | Period | Peak Hour | Westbound | Eastbound | total |
|--|------------|--------|-----------|-----------|-----------|------------|
| Beverly Glen Boulevard at New Westminster | 5/28/2019 | AM | 8-9 AM | 181 | 577 | 758 |
| | | PM | 4-5 PM | 211 | 385 | 596 |
| | | SAT | 1-2 PM | 218 | 385 | 603 |
| New Westminster at Brownridge/West Promenade | 5/29/2019 | AM | 8-9 AM | 248 | 476 | 724 |
| | | PM | 4-5 PM | 343 | 262 | 605 |
| | | SAT | 1-2 PM | 368 | 261 | 629 |

Ten (10) residential zones were selected based on proximity to the study area and likelihood to use the 3 selected streets as cut-through routes. Since the selected cut-through streets are all located west of Bathurst Street, the analysis first looked at trips originating in the west (Zones 1 – 7), cutting through one of the 3 identified cut-through streets, and destined to the east (zones 8 – 10 and the study area). Then the reverse was analyzed where trips originating in the east (zones 8 – 10 and the study area) cut-through and are destined to the west (zones 1- 7).

Trips that originated in or were destined to Zone 3 were not considered cut-through trips along Beverley Glen Boulevard and Mountbatten Road as they are within the same zone. Similarly, trips that originated in or were destined to Zone 1 were not considered cut-through along Brownridge Drive as it is located within the same zone.

3.8.2 Traffic Infiltration Analysis and Results

The traffic infiltration analysis in this section uses a StreetLight Index value⁸, which represents a relative volume of trip activity, rather than an actual representation of the amount of traffic on a particular street.

Trips from West to East

The first set of analyses conducted looked at traffic that originated in the west (Zones 1 – 7), passed through the gates (shown in **Figure 3-42**), and were destined to the east (Zones 8 – 10 and the Study Area). The cut-through percentages are relatively low for most roads, with Brownridge Drive experiencing relatively more cut-through traffic (32%

⁸ For more information on StreetLight Index, please see <https://support.streetlightdata.com/hc/en-us/articles/360029642992>

in the AM) compared to Beverley Glen Boulevard and Mountbatten Road. The results are summarized in **Table 3-18**.

Table 3-18: Average Cut-Through West to East (Trip Destinations: East Residential Areas and Study Area)

| Trip Origins | Beverley Glen Blvd | | | Mountbatten Rd | | | Brownridge Dr | | |
|------------------------------|--------------------|-----|-----|----------------|----|-----|---------------|-----|-----|
| | AM | PM | SAT | AM | PM | SAT | AM | PM | SAT |
| Within same concession block | 66 | 59 | 76 | 27 | 16 | 23 | 50 | 49 | 66 |
| West Residential Area | 4 | 21 | 9 | 0 | 1 | 0 | 24 | 32 | 49 |
| Total | 70 | 80 | 85 | 27 | 17 | 23 | 74 | 81 | 115 |
| % Pass-through | 6% | 26% | 11% | 0% | 6% | 0% | 32% | 40% | 43% |

Note: % Cut-through exceeding 30% highlighted with RED font.
Due to the nature of the Streetlight OD data, numbers presented in this table are “Streetlight Index Value”, which represents a relative volume of trip activity, rather than an actual representation of the amount of traffic on a particular street.

Trips from East to West

The second set of analyses conducted looked at traffic that originated in the east (Zones 8-10 and the study area), passed through the gates (shown **Figure 3-42**), and were destined to the west (Zones 1-7). The results are similar to the analysis in the opposite direction, although Brownridge appears to have an even higher proportion of cut-through trips. The results are summarized in **Table 3-19**.

Table 3-19: Average Cut-Through East to West (Trip Origin: East Residential Areas and Study Area)

| Trip Destination | Beverley Glen Blvd | | | Mountbatten Rd | | | Brownridge Dr | | |
|------------------------------|--------------------|-----|-----|----------------|----|-----|---------------|-----|-----|
| | AM | PM | SAT | AM | PM | SAT | AM | PM | SAT |
| Within same concession block | 30 | 57 | 88 | 4 | 23 | 34 | 8 | 56 | 82 |
| West Residential Area | 5 | 7 | 16 | 0 | 1 | 0 | 20 | 25 | 43 |
| Total | 35 | 64 | 104 | 4 | 24 | 34 | 28 | 81 | 125 |
| % Pass-through | 14% | 11% | 15% | 0% | 4% | 0% | 71% | 31% | 34% |

Note: % Cut-through exceeding 30% highlighted with RED font.
Due to the nature of the Streetlight OD data, numbers presented in this table are “Streetlight Index Value”, which represents a relative volume of trip activity, rather than an actual representation of the amount of traffic on a particular street.

Total Cut-through Trips

Table 3-20 summarizes the total east-west cut-through trips through Beverley Glen Boulevard, Mountbatten Road, and Brownridge Drive.

Table 3-20: Total Average Cut-through Trips

| Origin / Destination | Beverley Glen Blvd | | | Mountbatten Rd | | | Brownridge Dr | | |
|-------------------------------|--------------------|-----|-----|----------------|----|-----|---------------|-----|-----|
| | AM | PM | SAT | AM | PM | SAT | AM | PM | SAT |
| Within same concession block | 96 | 116 | 164 | 31 | 39 | 57 | 58 | 105 | 148 |
| West or East Residential Area | 9 | 28 | 25 | 0 | 2 | 0 | 44 | 57 | 92 |
| Total | 105 | 144 | 189 | 31 | 41 | 57 | 102 | 162 | 240 |
| % Pass-through | 9% | 19% | 13% | 0% | 5% | 0% | 43% | 35% | 38% |

Note: % Cut-through exceeding 30% highlighted with RED font.

Due to the nature of the Streetlight OD data, numbers presented in this table are "Streetlight Index Value", which represents a relative volume of trip activity, rather than an actual representation of the amount of traffic on a particular street.

The analysis shows that Beverley Glen Boulevard experiences relatively low rates of cut-through traffic, during the AM, PM, and Saturday peak hours. The highest average cut-through rate of 19% is experienced during the PM peak hour. Of the 28 trips cutting through Beverly Glen Boulevard in the PM peak hour, 21 trips (75%) originated in/were destined to the Study Area.

All traffic using Mountbatten Road originated within the same zone as the road during the AM and Saturday peak hour, resulting in very little cut-through traffic. Only 5% of traffic during the PM peak hour used Mountbatten Road as a cut-through route. Mountbatten Road does not directly lead into the Promenade area, which likely deters drivers from using it as a cut-through road.

Brownridge Drive exhibits high rates of cut-through traffic, greater than 30 percent, during all peak hours, with PM peak hour experiencing 71%. This road provides a direct connection into Promenade Centre. It is well connected to the surrounding residential areas, which provides an alternate route to the Mall without having to use busier arterial roads such as Centre Street. An average 71% of the cut-through trips originated in/were destined to the Study Area.

Based on the results of the traffic infiltration analysis, vehicle drivers primarily use Brownridge Drive or Beverley Glen Boulevard as cut-through roads, mainly for trips originating in or destined to the Study Area.

Traffic infiltration on residential streets can be mitigated by traffic control and traffic calming measures. This includes having unsignalized intersection connections (as opposed to signalized intersections) with major roads, and/or adding turn restrictions, although this measure should only be implemented with detailed analysis considering factors such as traffic operation efficiency and safety. Safety on residential streets can be improved through lowering speed limits and designing streets to enforce the vehicle operating speed. Traffic calming measures such as real-time speed signs, speed bumps, and traffic calming signage can also be implemented to reduce speed and improve safety on residential streets. Lastly, providing better vehicle, transit, walk, and cycle connections can encourage other modes of travel and help relieve congestion and reduce traffic infiltration on local streets. Measures to mitigate traffic infiltration will be further explored in the next phases of this study.

4 Subarea Model Development

A subarea model was developed for the Secondary Plan study area using the EMME platform, using the York Region EMME model as a base. The purpose of this model is to provide detailed traffic and turning movement forecasts for roads that would otherwise not be included in the Regional EMME model, including minor collector and local streets. Volumes produced from this model are used as inputs to provide growth rates to the existing turning movement volumes for the future year Synchro model intersection analysis.

A subarea was extracted from the York Region EMME model and further refined with a disaggregated zone system and detailed road network. Based on the disaggregated zone system, trip generation was conducted for the weekday AM, PM, and Saturday peak hour using the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition). Trips generated were then calibrated against observed traffic counts, and any adjustments are carried forward to the future year (2041) alternative analysis to provide more accurate results.

Recognizing that York Region's EMME model is based on the weekday AM peak hour, the AM travel demand matrix was transposed to develop the PM model to provide background traffic flows to the subarea model. In addition, Streetlight Origin-Destination data was obtained to provide additional OD data as well as the seed to the Saturday peak model.

This section documents the network and calibrated traffic volumes in the subarea model. Details can be found in **Appendix D Subarea Model Development and Calibration Memorandum**.

4.1 Subarea Model Zone System and Existing Network

The subarea model zone boundary is shown in **Figure 4-1**. The road network in the existing subarea model includes all arterials and collectors and is shown in **Figure 4-2**. Centroid connectors were specifically modified in order to reflect access to local and arterial roads accurately. Network assumptions such as free-flow speed and lane capacity were consistent with the York Region Model standards.

Figure 4-1: Subarea Model Zone Boundary

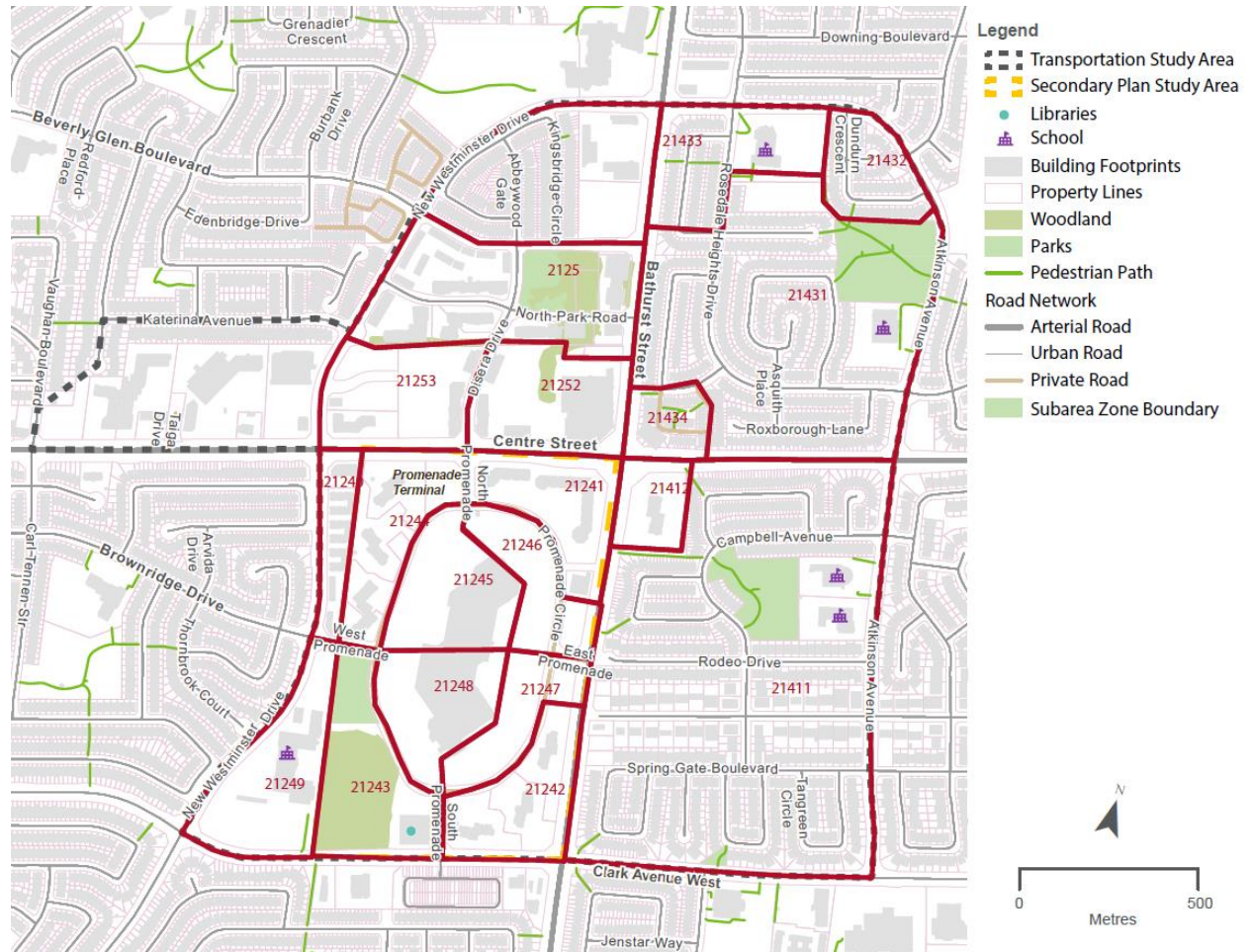
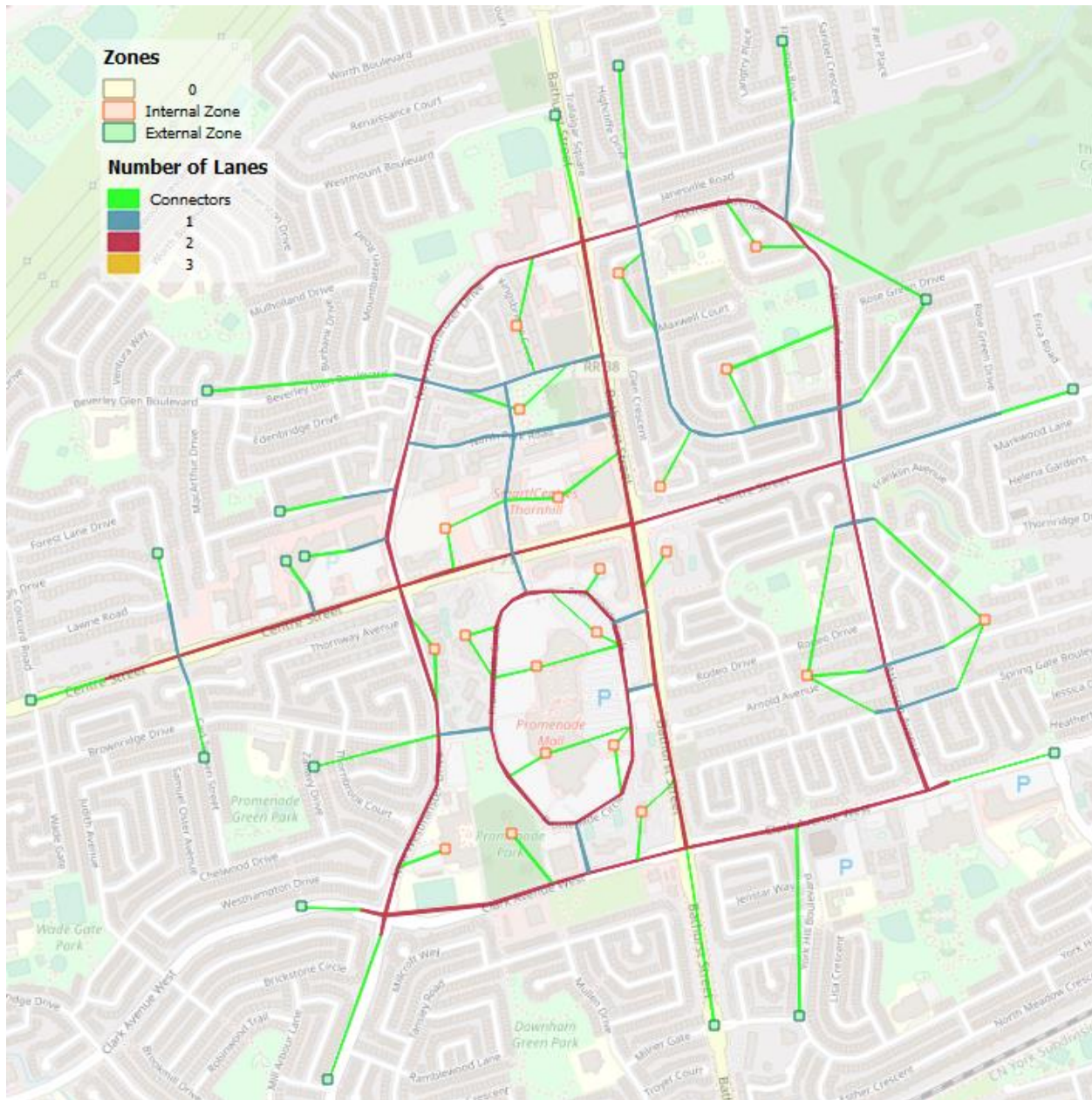


Figure 4-2: Subarea Model Network (Existing)



4.2 Calibration Summary

The GEH statistic was used to determine how well the base year modelled volumes match the observed volumes. The GEH statistic is able to address both absolute and relative difference between the modelled and observed volume. It avoids some pitfalls that occur when using only the relative difference, primarily by allowing for greater variance between modelled and observed data at lower values, but requiring lesser variance at higher values.

The GEH statistic is calculated as:

$$GEH = \sqrt{\frac{2(M - C)^2}{M + C}}$$

Where M is the hourly modelled volume and C is the observed volume (count).

A GEH value less than 5 is considered a good match between the modelled and observed volume; A value between 5 and 10 is acceptable; and a value higher than 10 usually requires further attention for model calibration. Typically 80% to 85% GEH values that are less than 5 is considered as very close match between the modelled and observed volume.

The base year model's results for all time periods with respect to the GEH statistic are shown in **Table 4-1**. The statistic shows that the modelled results are generally a good match with observed volumes.

Table 4-1: GEH Statistic

| GEH | Adjusted Demand, Capped, AM Peak Hour | | Adjusted Demand, Capped, PM Peak Hour | | Adjusted Demand, Capped, WK Peak Hour | |
|--------------|---------------------------------------|-------------|---------------------------------------|-------------|---------------------------------------|-------------|
| | # of Links | % | # of Links | % | # of Links | % |
| | <=5 | 104 | 70% | 118 | 79% | 123 |
| 5-10 | 35 | 24% | 25 | 17% | 24 | 15% |
| >10 | 9 | 6% | 7 | 5% | 8 | 5% |
| Total | 148 | 100% | 150 | 100% | 155 | 100% |

4.3 Existing Subarea Model Traffic Volumes

The calibrated traffic volumes for the AM, PM and Saturday peak hours are shown in **Figure 4-3**, **Figure 4-4**, and **Figure 4-5** respectively.

Figure 4-3: Subarea Area Model Traffic Volumes, Existing AM Peak Hour

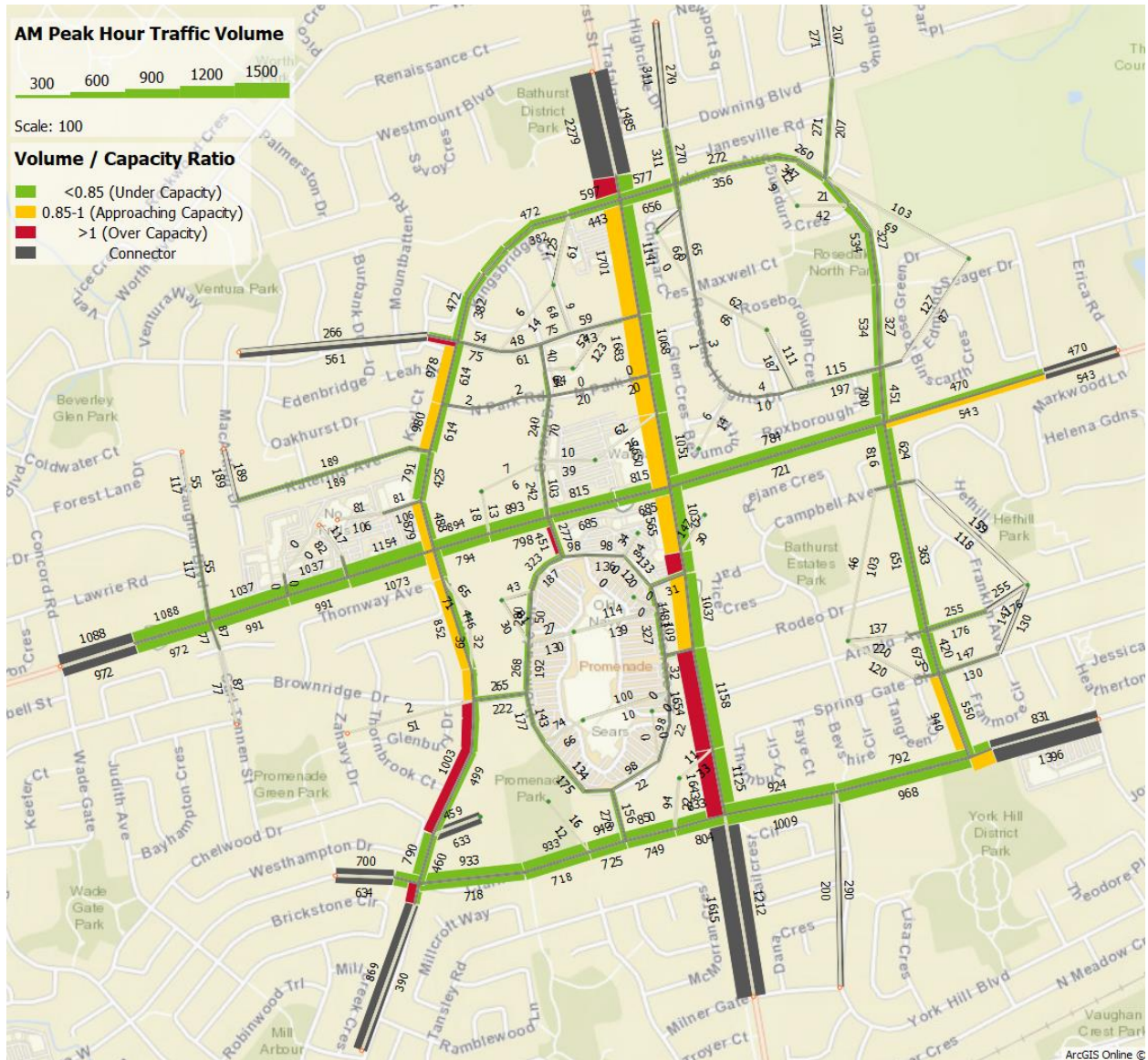


Figure 4-4: Subarea Area Model Traffic Volumes, Existing PM Peak Hour

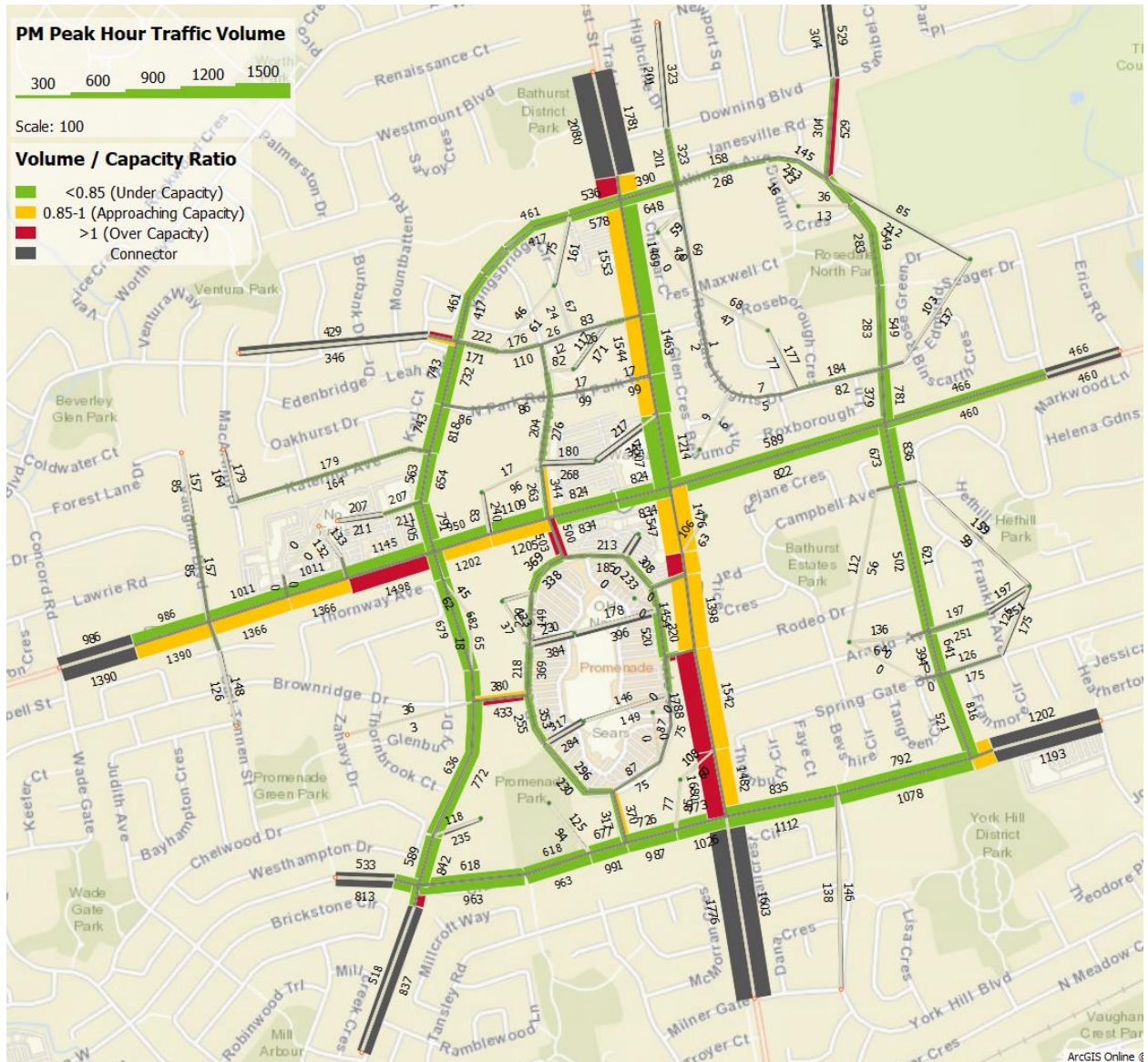


Figure 4-5: Subarea Area Model Traffic Volumes, Existing Saturday Peak Hour



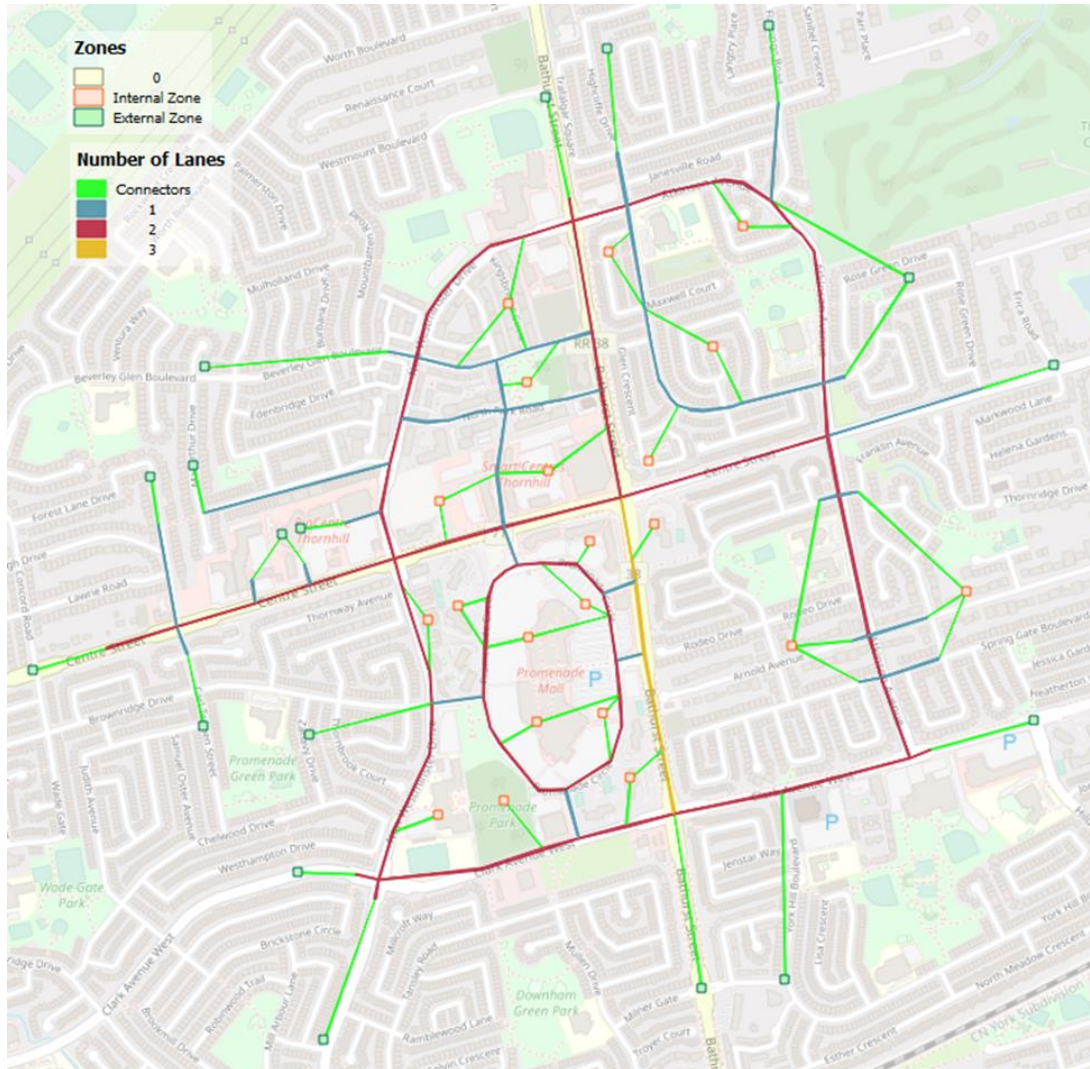
4.4 2041 Base Case Model

The 2041 base case land use assumes the York Region’s 45% intensification scenario for background transversal demand. In addition, developments that are completed or under construction are included in the base case and their associated demand was generated using the ITE Trip Generation Manual, with transit mode share from the York Region Model applied. It is noted that for future testing of land use and transportation scenarios, different transit mode share will be explored based on literature review and proxies from other areas with similar density and transit service.

The 2041 base case scenario assumes planned improvements identified in the York Region TMP. Bathurst Street was widened from 4 to 6 lanes south of Centre Street with HOV lanes.

The 2041 Base Case road network is shown in **Figure 4-6**.

Figure 4-6: 2041 Base Case Network



The 2041 subarea model uses the York Region model demand as a base. After disaggregation, trip generation and distribution, the demand adjustment factors from the base year (existing model) are applied to the 2041 demand.

4.5 2041 Base Case Traffic Volumes

The 2041 AM, PM and weekend peak hour traffic volumes are shown in **Figure 4-7**, **Figure 4-8**, and **Figure 4-9**, respectively. With the projected population and employment growth, the area is expected to be heavily congested in 2041.

Figure 4-7: 2041 Base Case AM Peak Hour Traffic Volume

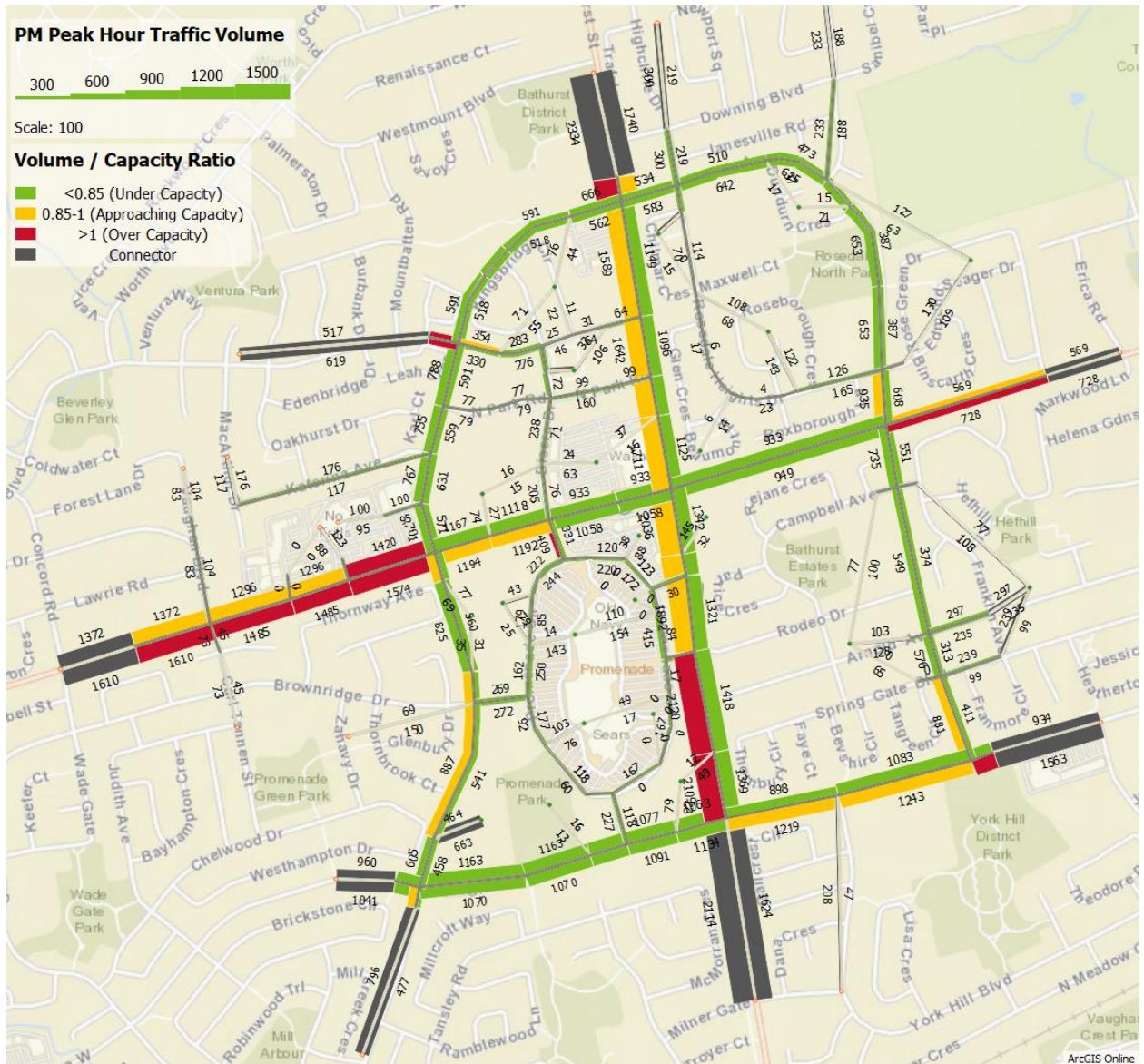


Figure 4-8: 2041 Base Case PM Peak Hour Traffic Volume

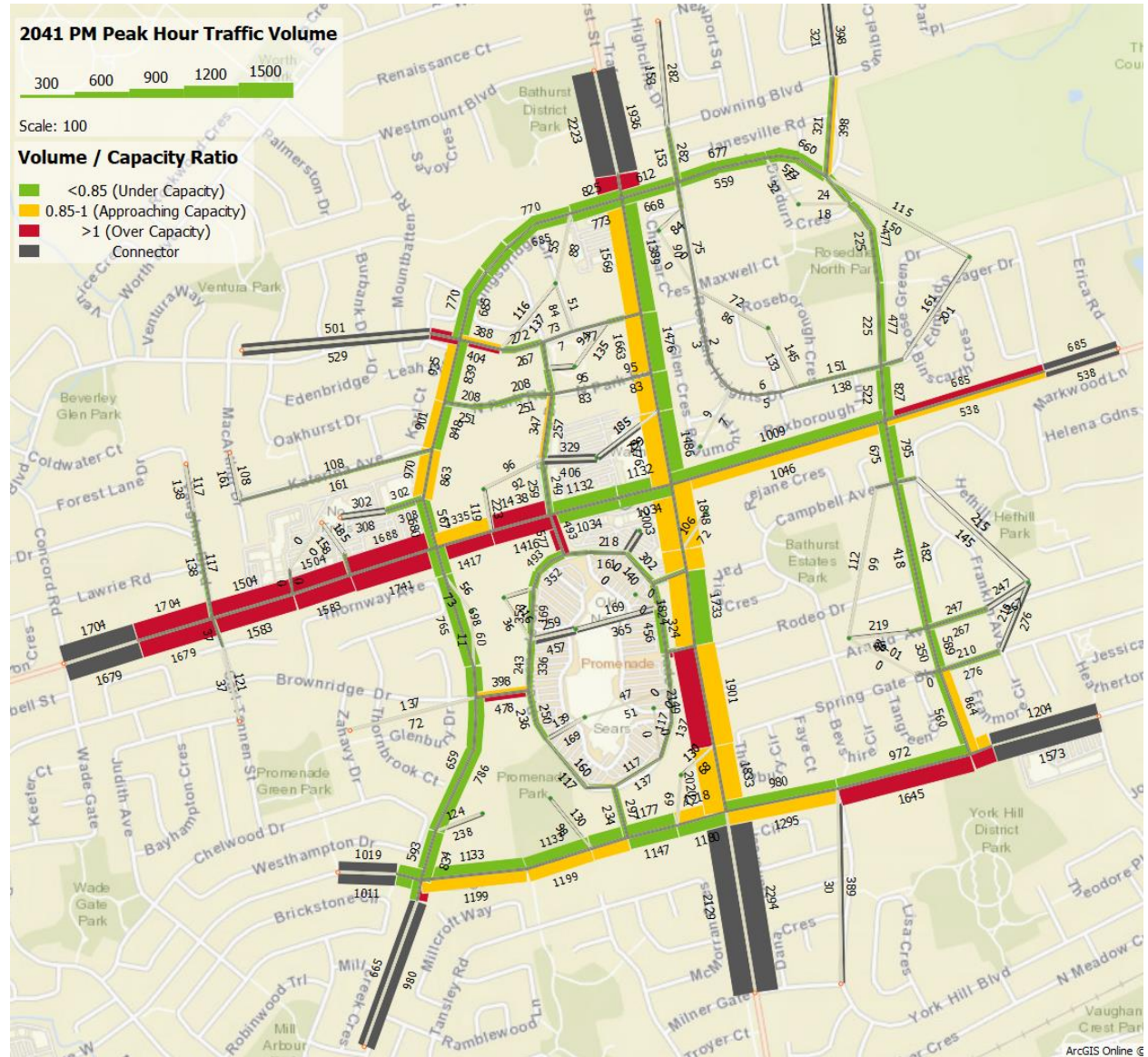


Figure 4-9: 2041 Base Case Saturday Peak Hour Traffic Volume



5 2041 Base Case Traffic Operations

The 2041 future base case traffic volumes were developed by factoring up the existing traffic volumes based on the EMME growth rates between the existing and 2041 base case scenario. Similar to the existing condition analysis (**Section 3.7.3**), if traffic volumes at adjacent intersections were different by more than 10%, they were balanced to within 10% (except if there were significant accesses / driveways in between).

Existing laning and signal timing were used as a base, with the exception of Bathurst Street south of Centre Street, which is planned to be widened to include an HOV through lane in each direction (north-south), for a total of three core through lanes in each direction. To account for the fact that HOV lanes are less utilized than general purpose lanes, a combined lane utilization factor of 0.85 was used for the northbound and southbound through lane groups. The lane utilization factor is based on the lane capacity used in the 2041 York Region model.

Signal timings were optimized at intersections where turning movements were beyond capacity, and the network coordination was optimized.

The intersection of New Westminster Drive and the No Frills Access was signalized due to a non-signalized v/c ratio greater than 1.0 and LOS F in the Weekend peak hour.

Traffic volumes for the 2041 base case scenario can be seen in **Figure 5-1**. Critical turning movement LOS are also illustrated in **Figure 5-2** through **Figure 5-4**. As with the existing horizon, full results can be found in **Appendix E**.



Figure 5-1. 2041 Background Traffic Volumes

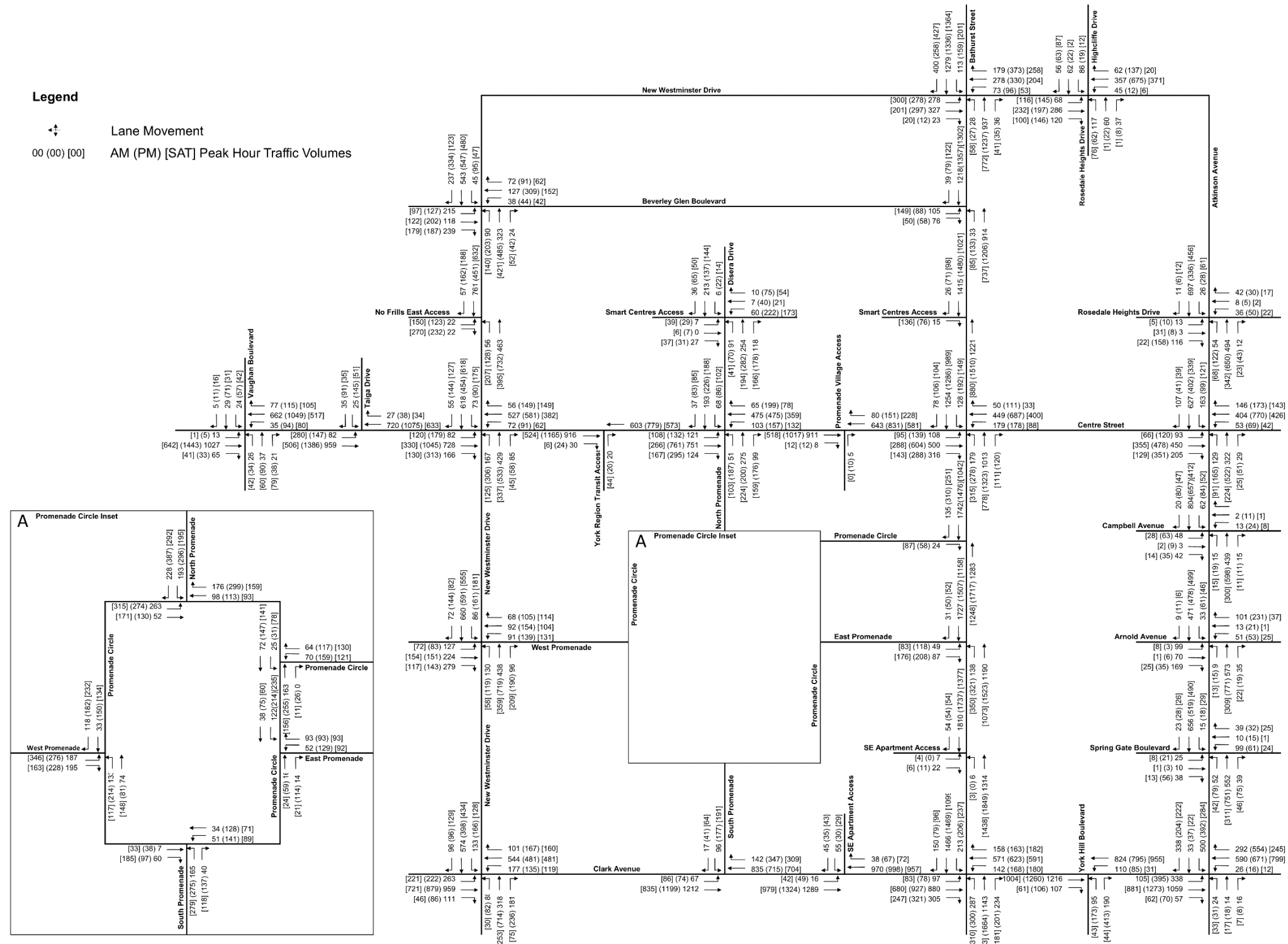


Figure 5-2: 2041 Base Case AM Peak Hour - Intersection and Critical Movement LOS



Figure 5-3: 2041 Base Case PM Peak Hour - Intersection and Critical Movement LOS



Figure 5-4: 2041 Base Case Weekend Peak Hour - Intersection and Critical Movement LOS



5.1 2041 Base Case Traffic Operations Summary

Similar to the existing conditions, a number of movements and intersections continue to exceed the performance thresholds. Intersections with movements that exceed the v/c and LOS thresholds are listed below, with the new intersections added to the list (those that exceed the thresholds only in the 2041 base case scenario) are bolded:

- New Westminster Drive & Bathurst Street
- Bathurst Street & Beverly Glen Boulevard
- Carl Tennen Street / Vaughan Boulevard & Centre Street
- Centre Street & No Frills Access
- New Westminster Drive & Centre Street
- North Promenade / Disera Drive & Centre Street
- Bathurst Street & Centre Street
- Atkinson Avenue & Centre Street
- Bathurst Street & East Promenade
- Bathurst Street & Clark Avenue
- **Clark Avenue & York Hill Boulevard**
- Clark Avenue & Atkinson Avenue
- Clark Avenue & SE Apartment Access

The following intersections operate within the v/c and LOS thresholds, but have queues that exceed the available storage during one of the peak hours. The new additions are bolded:

- Atkinson Avenue & Highcliffe Drive / Rosedale Heights
- New Westminster Drive & Beverley Glen Boulevard
- Disera Drive & Smart Centres Access
- **Atkinson Avenue & Rosedale Heights / Edmond Seager**
- New Westminster Drive & Brownridge Drive / West Promenade
- New Westminster Drive & Clark Avenue
- **New Westminster Drive & No Frills East Access**

5.2 2041 Base Case SimTraffic Analysis

SimTraffic analysis was conducted for Centre Street and Bathurst Street . Based on the analysis results and a visual inspection of the SimTraffic analysis, the following is a summary of the 2041 base case scenario:

Overall

- The varied cycle length and operation (due to future BRT preemption) at Centre Street and Bathurst Street is inconsistent with the signal timing regimes on the Centre Street (130s cycle lengths) and Bathurst Street corridors (140s cycle lengths), and limits the opportunity for consistent coordination
- Delay and travel time did not increase linearly across the network, and have instead increased for select movements and intersection along the corridors
- In some cases, an increase in traffic and congestion at one intersection creates a filtering effect that reduces the number of vehicles passing a certain location, and this then improves the travel time and speeds on the downstream sections of the street
- The PM peak hour operation generally decreased significantly more than the AM and Saturday peak hours

Centre Street

- Eastbound travel time significantly increased due to limited capacity at the intersections with Vaughan Boulevard and New Westminster Drive.
- Westbound travel is restricted at the intersection with Bathurst Street

Bathurst Street

- The introduction of a third through lane at Bathurst Street and Clark Avenue reduced the northbound delay and travel time in the PM peak hour, but had less of an impact during the other peak hours
- The third lane had little to no impact on southbound travel on Bathurst Street
- Southbound travel on Bathurst is restricted based on the capacity of the intersection with New Westminster / Atkinson Avenue

6 Transportation Challenges and Opportunities

Based upon the review of existing conditions, the following major challenges and opportunities are identified:

1. Creation of a fine-grid Complete Street network
2. Build upon the City's Pedestrian and Bicycle Master Plan update
3. Maximize access to transit through first and last mile active transportation connections
4. Leveraging new mobility solutions
5. Establish EcoMobility Hubs
6. Align parking management with TDM
7. A sustainable land use and transportation plan to achieve the goals of Green Directions Vaughan

6.1 Create a fine-grid, Complete Street network

The Promenade Centre today is characterized by a private ring road encircling Promenade Mall, which is designed to provide access to surface parking lots. There are only a few formal walking paths through the site with portions of the ring road lacking sidewalks. The most direct routes for pedestrians are often through parking lots and this current built form encourages the status quo of automobile access to the mall. The redevelopment of the study area should establish a finer-grained street network that provides direct, safe and comfortable connections, in particular for active transportation modes. The road network should build upon the "High Street" concept (**Section 2.6.1**), which is the north-south road to the east of the Promenade Mall in the approved Promenade Mall Phase 1 Redevelopment Proposal (2018). The secondary plan study area should be supported by an additional secondary north-south connection and one or two east-west spine roads to provide fine-grid network to provide all transportation modes with more mobility choice through and connecting to and from the Regional network to the Promenade Centre site.

6.2 Build upon the City's Draft Pedestrian and Bicycle Master Plan Update

The active transportation network should build upon recommendations in the City's Draft Pedestrian and Bicycle Master Plan including providing access to the proposed cycle tracks on Clark Avenue and the bike facilities on Centre Street and Bathurst Street constructed through the vivaNEXT project. Connections should also be provided to existing and proposed trails into adjacent communities and new pedestrian or cyclist crossings should be considered across arterial roadways. One example for this is the missing gap on Clark Avenue west of New Westminster Drive, where a trail crossing

should be implemented connecting Downham Green Park to the south to Pierre Elliot Trudeau Park and St Elizabeth Catholic High School to the north.

6.3 Maximize access to transit through first and last mile active transportation connections

Significant transit improvements are expected for the study area with vivaNext construction to be completed by the end of 2019, which will bring BRT in dedicated ROW. There are three MTSA's in the transportation study area, Taiga, Disera-Promenade, and Atkinson. The future extension of the Yonge Subway to Richmond Hill Centre will also improve transit access to Toronto with viva curbside service planned to be implemented between the Yonge Subway and the Promenade Centre. With all of these investments in transit services, the Promenade Centre study can capitalize on them through redevelopment by creating a fine-grid Complete Street network that promotes safe and convenient access to future transit stops.

6.4 Leveraging new mobility solutions

To complement the fine-grid network, new, sustainable mobility technologies such as micro-mobility (shared electric scooters and bikes) can be leveraged. Given the size of the Secondary Plan area (800m x 500m) and the location of the vivaNext and YRT transit terminal at the north end, micro-mobility solutions can provide a sustainable option for travel within, to and from the Secondary Plan area and key destinations such as the transit terminal.

Shared electric scooters and bikes have not yet been implemented within the City of Vaughan yet. However, the provincial government is implementing a five year pilot program to allow electric scooters on Ontario roadways beginning January 1, 2020, which will like provide the City with implementation examples in similar jurisdictions to build from.

The shared aspect of these bikes and scooters is also attractive to the younger generation who are increasingly willing to adopt share commodities and pay-per-use services, including mobility services. This also applies to existing ride hailing technology (such as Uber / Lyft) and car share programs. The accessibility both physically and economically of these mobility options is allowing people to choose to not own a private automobile in an increasingly transit oriented City of Vaughan.

6.5 Establishing EcoMobility Hubs

The "EcoMobility hub"^{9 10} concept provides single-point nodes for multiple shared mobility services and has been implemented in Europe and other parts of the world while the City of Toronto is also working on implementing these hubs. Designated, comfortable

⁹ Karim D. M., Innovative Mobility Master Plan: Connecting Multimodal Systems with Smart Technologies, Disrupting Mobility Conference, MIT Media Lab, Cambridge, USA, November 11~13, 2015.

¹⁰ Karim D. M., Creating an Innovative Mobility Ecosystem for Urban Planning Areas, Disrupting Mobility - Impacts of Sharing Economy and Innovative Transportation on Cities, Springer Book, Lectures in Mobility, ISBN: 978-3-319-51601-1, pages 21-47, 2017.

waiting areas to find a bike-share rack, car-share vehicle, or wait for a ride-share driver are provided at key gathering locations in an area. This includes at transit stops and in close proximity to them which can address the “first and last mile” problem. An illustration of an EcoMobility hub is provided in **Figure 6-1**, which shows a large scale hub incorporating multiple systems. These hubs may also be smaller scale, such as an on-street car-share station or an integrated bike share and bus stop.

These measures can be implemented at locations such as vivaNEXT BRT stations, Promenade Transit Terminal, and at the Promenade Mall or locations central to the Secondary Plan Area, which will provide convenient access to shared mobility service either as the primary mode of travel or as a first-last mile solution to transit. Implementation of hubs in the surrounding neighbourhoods and development areas along Centre Street are also a key component to providing mobility choice.

These hubs, and the available of mobility options, represent a major opportunity to influence travel behaviour including the up-front decision to own a personal automobile. Influencing the auto-ownership decision will ultimately improve the transit and active transportation mode share in the study area and help achieve the sustainable travel targets indicated in York Region and City of Vaughan OP.

Figure 6-1: EcoMobility Hub Concept



Source: multi mobility, Sophia von Berg, 2014

6.6 Align parking management with TDM

In addition to high rates of auto ownership in the City of Vaughan, the availability of free parking is a major factor in travel choice. Limiting parking and managing it (i.e. paid parking) are critical elements to encouraging sustainable travel. While the Smart Commute travel demand management (TDM) program has demonstrated successful shifts in mobility behaviour away from the single occupant vehicle, aligning these TDM measures with sustainable infrastructure and more aggressive parking policies is needed

to truly affect the aspirational change set forth by the York Region and City of Vaughan Official Plan targets of 40-50% non-auto mode share in the study area.

A major opportunity in the Promenade Centre Secondary Plan study area is to develop a land use and mobility plan which maximizes connectivity to the Major Transit Station Areas within and adjacent to the study area, combined with parking policies which align directly with the provision of TDM measures. An example of such policies is seen in the City of Vancouver and detailed TDM and parking policies may help support the City of Vaughan's aspiration to encourage sustainable travel behaviour in the Promenade Centre Secondary Plan area.

6.7 A sustainable land use and transportation plan to achieve the Goals of Green Directions Vaughan

The City of Vaughan's Community Sustainability Plan, Green Directions provides a framework to achieve a healthy natural environment, vibrant communities, and a strong economy. The Promenade Centre Secondary Plan represents a major opportunity to work towards a sustainable future particularly in the area of transportation, where one of the key actions is to ensure that the City is easy to get around with a low environmental impact.

Transportation infrastructure and policies are a key component of any sustainability plan. More than one third of Ontario's greenhouse gas (GHG) pollution is caused by the transportation sector, with cars and trucks responsible for more than 70% of the total. Most trips (more than 84%) to the study area today are made by auto drive or passenger modes. Among them, a significant amount of trips are short distance trips under 1km (15% of all trips) and 3km (41% of all trips), which has a high potential to be shifted to walking or cycling trips with the safe active transportation facilities and relevant policy directions in place. With Viva Orange service opening by the end of 2019, there is also a high potential for people to shift to transit trips.

Appendix A: Collision Analysis

Appendix B: Multimodal Level of Service (MMLoS) Methodology

Appendix C: Multimodal Level of Service (MMLoS) Results

Appendix D: Subarea Model Development and Calibration Memorandum

Appendix E: Existing & 2041 Base Case Complete Traffic Analysis Memo (Includes Signal Timing, Viva Orange Drawings, and Synchro Print Outs)