Final Report

City of Vaughan

January 2019

Amended in response to public comments August 2019

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1 Introduction

The North Vaughan and New Communities Transportation Master Plan (NVNCTMP) is a long-range plan that supports policies, programs and infrastructure required to meet existing and future mobility needs and provide context for transportation decisions within North Vaughan. The objective of this plan is to look at both internal and external factors that contribute to achieving sustainable transportation for residents and businesses while ensuring recommendations of the plan address the transportation network needs from immediate to future growth. It is to be noted the NVNCTMP does not develop any policies but provide input to potential policies based on recommendations and findings.

The study is being conducted in parallel and in close coordination with secondary plan studies for the New Community Areas of Block 27 and 41, and will address the following goals:

1. Review and provide input to the planning policies and infrastructure master plans covering the study area.
2. Reflect and supports the principles and objectives of the Vaughan Official Plan 2010 (VOP 2010), the city-wide Transportation Master Plan 2013, and the 2007 Pedestrian and Bicycle Master Plan (currently being updated)
3. Identify and address the opportunities and constraints imposed by current transportation infrastructure and emerging influences, including the review of the roadway functions and identify jurisdictional transfer opportunities.
4. Identify a preferred transportation network, which addresses the transportation requirements for the Block 27 and 41 Secondary Plan areas considering the development of the internal transportation networks in these blocks and their connectivity to the external transportation networks. The preferred transportation networks for Block 27 and Block 41 forms the technical basis of amendments to the VOP 2010 for these two Secondary Plan areas.
5. Establish the need and justification for proposed collector roads in compliance with Phases 1 and 2 of the Class EA.
6. Identify potential additional projects in the North Vaughan area that may be required to accommodate the development of the Block 27 and Block 41 Secondary Plan areas.
7. Identify a group of Schedule “C” projects that will be required for construction in the New Community Block Areas in stages to support development and the new Kirby GO Station

1.1 Study Area and Background

The NVNCTMP study area considers both a “Primary Study Area” and an “Overall Study Area”. The primary study area for North Vaughan and New Communities Transportation Master Plan is bounded by King-Vaughan Road to the north, Highway 27 to the west, Teston Road to the south and Bathurst Street to the east. An overall study area extending the southern limit to Major Mackenzie Drive is also included for transportation network connectivity considerations. The two study areas are illustrated in **Exhibit 1-1**.

The primary study area is approximately 6,575 ha with half of the area designated as Greenbelt or Oak Ridges Moraine. There are three future development areas within the study area as identified in the VOP 2010:

- Blocks 27 and 41, New Community Area,
- Blocks 34 and 35, Highway 400 North Employment Lands, and
- Block 55 East, Kleinburg-Nashville Focused Area.

Blocks 40/47 Block Plan area, bordering the southern limit of the primary study area, is included in the analysis due to its impact on the road network system for the primary study area.

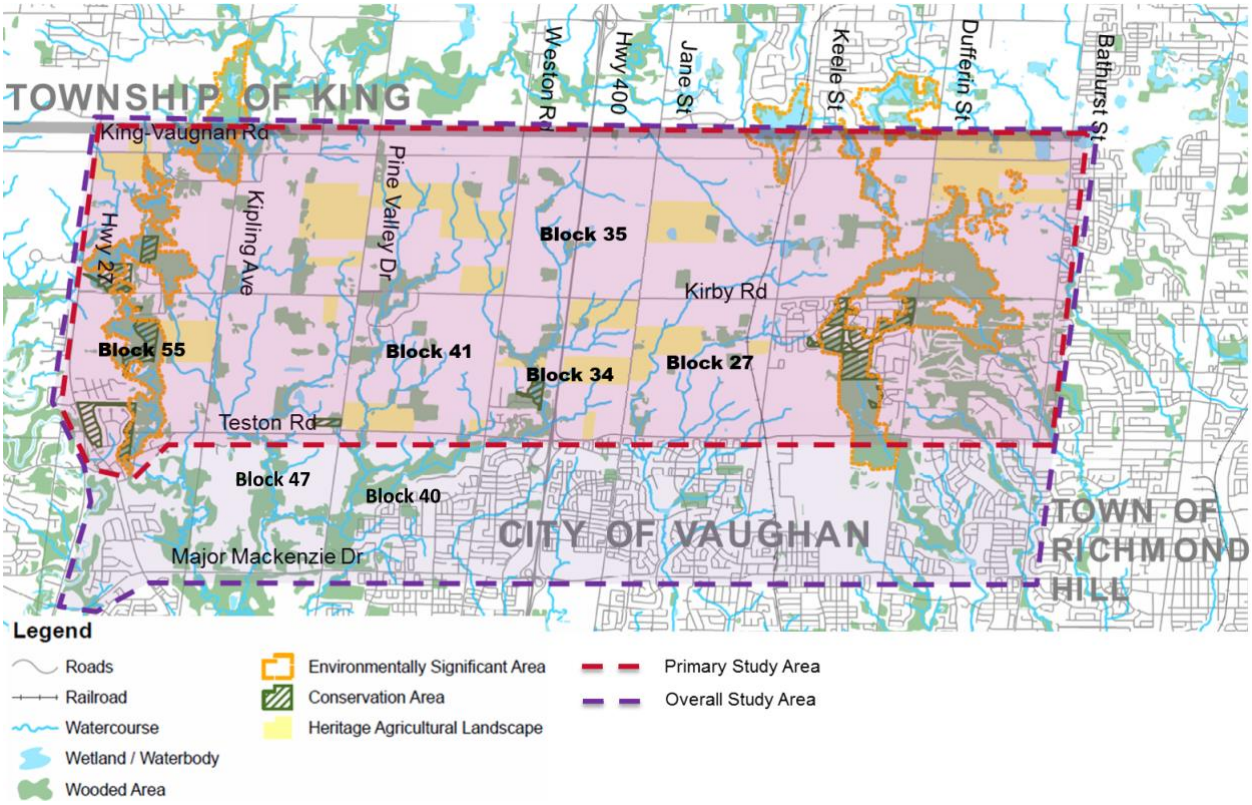


Exhibit 1-1: Primary and Overall Study Area

References to the "study area" later in the report refer to the Primary Study Area unless otherwise noted.

1.2 Relation to Block 27 and Block 41 Secondary Plans

The City of Vaughan has embarked on the preparation of Secondary Plans in accordance with the York Region Official Plan and VOP 2010, to provide for the development of the City's New Community Areas to the year 2031 and beyond. The lands were previously approved for urban development by York Region. The Secondary Plans for the New Communities will set the policy framework for the development of complete communities with a unique sense of place and high-quality design.

The Plan development process will be comprehensive, taking into consideration provincial, regional and municipal policy frameworks. It will also look at locational environmental features, transportation analyses, community facilities and services, the future Kirby GO station in Block 27, infrastructure needs and urban design. The New Community Areas of Vaughan will be primarily residential and be designed to be compact, vibrant, inclusive, healthy, sustainable and diverse. They will include retail stores, restaurants, offices, parks and community facilities, schools, and a variety of residential housing types and densities.

The Block 27 and 41 Secondary Plans are being developed in coordination with this NVNCTMP to provide a broader context and consideration for transportation network needs to support the development of Block 27 and Block 41. This process is discussed throughout this report, with detailed analysis and documentation provided in **Appendix A** for Block 27 and **Appendix B** for Block 41**.**

1.3 TMP Purpose and EA Process

The purpose of the North Vaughan and New Communities Transportation Master plan (NVNCTMP) identifies the transportation requirements for the New Community Areas, Block 27 and Block 41, ensuring the transportation networks for these communities are integrated and connected to the North Vaughan area.

This study follows the Approach #1 of the Transportation Master Plan (TMP) process, an open public process following Municipal Class Environmental Assessment (MCEA) Guidelines (October 2000, as amended in 2007, 2011 and 2015) so that the study results can properly serve as direct input to any subsequent Environmental Assessment (EA) studies for Schedule B and C infrastructure projects. The study addresses at a broad level Phases 1 and 2 of the five-phase MCEA process. Phase 1 intends to identify problems and/or opportunities whereas Phase 2 aims to evaluate alternative planning solutions, consider environmental implications, consult with the public and affected agencies, and identify the preferred planning solution. Phases 3 through 5 will be carried out through subsequent EA studies focusing on design alternatives and detail design elements of a project. **Exhibit 1-2** illustrates the TMP process.

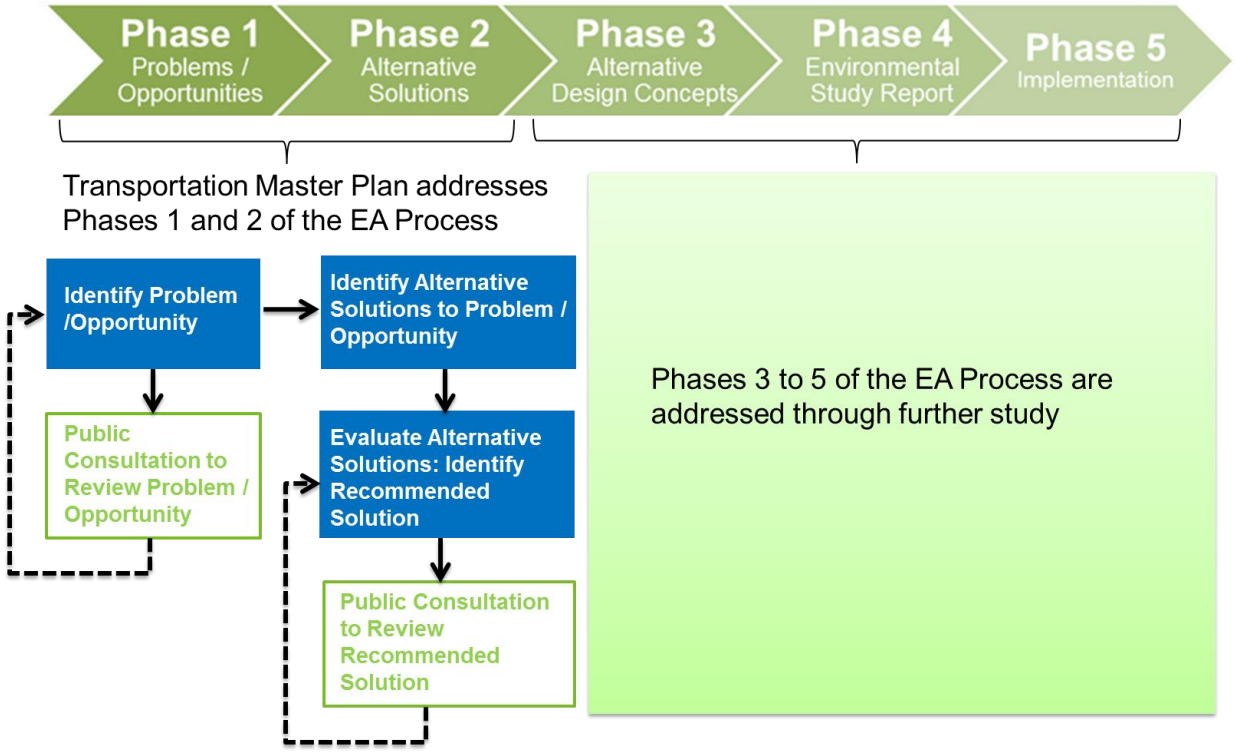


Exhibit 1-2: Transportation Master Plan Process
Source: Municipal Class Environmental Assessment (October 2000, as amended in 2007, 2011, and 2015)

2 Background Planning Policies and Guidance

This section provides context for the study in relation to planning policies and guidance at the provincial and municipal level.

2.1 Provincial Planning Context

A number of provincial policy documents provide the basis and guidance for the transportation vision for NVNCTMP. Provincial plans and their impact to the NVNCTMP are identified and summarized in **Table 2-1**.

Table 2-1: Provincial Planning Policies

Provincial Planning Document	Directions	Impact to NVNCTMP & Input to Block 27 Secondary Plan
Provincial Policy Statement, Ontario, 2014	Description: Provides direction on land use planning and development, and the transportation system. Directions: The most relevant land use and transportation policies) include: • **1.6.7.1** Safe, energy efficient, transportation systems that move people and goods and address projected needs • **1.6.7.2** Use of travel demand management (TDM) strategies to maximize efficiency • **1.6.7.3** A multimodal transportation system that provides connections within and among transportation systems and modes including across jurisdictional boundaries • **1.6.7.4** Land use patterns that minimize length and number of vehicle trips to support transit and active transportation • **1.6.7.5** Integrate transportation and land use considerations at all stages of planning • **1.6.8.2** Protect for major goods movement facilities and corridors • **1.6.8.3** New development should be compatible with the long-term purposes of the corridor	The NVNCTMP will consider projected needs for both people and goods, encourage travel demand management, consider all travel modes, and closely coordinate with the City of Vaughan Block 27 and Block 41 Secondary Plans to integrate land use and transportation planning.

Provincial Planning Document	Directions	Impact to NVNCTMP & Input to Block 27 Secondary Plan
Growth Plan for the Greater Golden Horseshoe (GGH), Ministry of Municipal Affairs, 2006, 2013, 2017 Update	Description: The Growth Plan for the GGH was released on June 16, 2006, and is a long-term plan that aims to: • Revitalize downtowns • Create complete communities • Provide housing options to meet the needs of people at any age • Curb urban sprawl and protect farmland and green spaces • Reduce traffic gridlock by improving access to a greater range of transportation options The June 2013 amendment extended the growth planning horizon to 2041 while the 2016 update identified new intensification targets. Directions: The Growth Plan defines specific policies for where and how to grow, including the identification of defined urbanized areas versus a protected Greenbelt Area. The plan also identifies Urban Growth Centres across the Greater Toronto Area (GTA), Major Transit Station Areas and Intensification Corridors. There has been a 2017 update to the Growth Plan.	The study area is at the northern boundary of the urbanized area. The Vaughan Metropolitan Centre is a designated Urban Growth Centre south of the study area, through which transit connections to the greater regional rapid transit network can be made.
2041 Regional Transportation Plan updated in 2018 from The Big Move, Metrolinx, 2008	Description: The Big Move is the Greater Toronto and Hamilton Area's (GTHA's) multi-modal long-range regional transportation plan. Since 2008 this plan has been providing strategic direction for planning, designing and building a regional transportation network that enhances quality of life, environment, and prosperity. Directions: The Big Move sets the context for Regional Express Rail (RER), a frequent all-day, two-way express rail service on existing GO Rail lines with 15 minute frequencies using future electrification infrastructure. In order to support the expanded services, improvement to infrastructure is needed: • Track expansion, including upgrade of existing structures within corridor such as culverts, bridges • Grade separations • Maintenance and storage facilities • Electrification infrastructure • Station Expansion (parking, building, pedestrian access, etc) • New station(s) along corridor that will optimize ridership and minimize delay As of 2018, the 2008 Big Move has been updated to the 2041 Regional Transportation Plan (RTP)	The Kirby GO Station, located within Block 27, is included as a new station along the Barrie GO Corridor as part of the RER project. The City will work with Metrolinx to implement transit supportive planning around the station, develop sustainable station access solutions, and support the works required for RER, including planning for grade separation of rail crossings.

Provincial Planning Document	Directions	Impact to NVNCTMP & Input to Block 27 Secondary Plan
Transit-Supportive Guidelines, Ministry of Transportation, 2012	Description: Identifies best practices in Ontario, North America and abroad for transit-friendly land-use planning, urban design, and operations. Directions: Key directions relevant to the NVNCTMP include layout and spacing of arterial and collector streets: • Street networks are fine-grained and interconnected 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 400 m 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 200 m apart. Key directions for planning around major transit station areas include: • A rational progression of facilities from passenger pick up and drop off / bus transfer / parking areas to ticketing and wayfinding, safe and comfortable waiting areas, and finally to transit loading areas • Organize surface parking areas into smaller modules to facilitate defined walking and cycling paths to the stations and also establish future development parcels over time • Prioritize pedestrian access • Limit free surface parking where frequent feeder transit service is available	The new communities in Blocks 27 and 41 and the conceptual plans for the Kirby GO Station shall be planned in accordance with the Transit Supportive Guidelines.
#CycleON: Ontario's Cycling Strategy, Ministry of Transportation, 2013	Description: Identifies a vision for cycling in the province over the next 20 years where cycling is valued as a core mode of transportation. Directions: Key directions relevant to the NVNCTMP include: • Partner with municipalities to implement Complete Streets policies and develop active transportation plans • Partner with municipalities / transit agencies to integrate cycling and transit • Develop a funding partnership to build provincial and municipal cycling routes, including pilot program funding to gather data and test new ideas • Create comminities that have a built form that supports and promotes cycling for all trips under 5 km	The NVNCTMP strives to plan for cycling infrastructure and complete communities in accordance with this plan.

Provincial Planning Document	Directions	Impact to NVNCTMP & Input to Block 27 Secondary Plan

Ontario's Climate Change Action Plan	Description: Identifies a five-year plan to fight climate change, reduce greenhouse gas pollution, and transition to a low-carbon economy.
	
	Directions: Specific action areas are identified to meet specific greenhouse gas emission reduction targets:
	• Transportation: Becoming a North American leader in low-carbon and zero-emission transportation
	  ○ Increase the use of electric vehicles
	  ○ Support cycling and walking
	  ○ Support the accelerated construction of GO Regional Express Rail
	• Land use planning: Support low-carbon communities
	  ○ Strengthen climate change policies in the municipal land use planning process
	  ○ Eliminate minimum parking requirements
		Sections 9.3 and 9.4 of The NVNCTMP made recommendations regarding the implementation of Active Transportation and Travel Demand Management (TDM) to promote sustainable mode of transportation to increase the number of active transportation trips and reduce the number of single-occupancy vehicles. NVNCTMP project team also worked collaboratively with planning staff on the development of Block 27 Secondary Plan, which outlines policies that are supportive of active and sustainable mode of transportations.
		Policies 2.2 b.ii) and ix) of the Secondary Plan, support balanced mobility mix, including the use of electric vehicles and prioritize parking for cyclists, carpool users, electric/fuel efficient and compact vehicles and emerging shared mobility

Provincial Planning Document	Directions	Impact to NVNCTMP & Input to Block 27 Secondary Plan
Greenbelt Plan (2017)	Description: In concert with the Growth Plan, Niagara Escarpment Plan (NEP) and Oak Ridges Moraine Conservation Plan (ORCMP), and further to the PPS, the Greenbelt Plan establishes land use planning framework for the GGH to support a clean and healthy environment, a thriving economy and social equity. Directions: Identifies areas where urbanization should not occur in order to protect the ecological, agricultural, and hydrological land use. Lands identified in the NEP and ORCMP are also included in the Greenbelt Plan.	Within Block 27, lands along some hydrological features are part of the Protected Countryside of the Greenbelt Area and part of the Natural Heritage System. Within Block 41 approximately 40% of lands are designated under the Greenbelt Plan. However, the Natural Heritage Network for Block 41 is still under review and will be confirmed through ongoing study. As a result, land use boundaries in the Block may change. The NVNCTMP strives to support the achievement of complete communities and community hubs that are conveniently accessible by active transportation and transit. Infrastructure will integrate with land use planning while minimizing environmental impacts in the Protected Countryside of the Greenbelt Area.
Oak Ridges Moraine Conservation Plan (2002), Updated in May 2017	Description: Identifies policy and plans to provide land use and resource management direction for the 190,000 hectares of land and water within the Moraine. The subject area is also accounted for in the Greenbelt Plan. Directions: Protect the ecological and hydrological integrity of the Oak Ridges Moraine Area and provide land and resource uses and development that are compatible with other objectives of the Plan. Transportation infrastructure development is permitted in key natural heritage features and hydrological sensitive features if it will not adversely affect these features.	The Oak Ridges Moraine Area is part of the lands designated under the Greenbelt Plan and is a significant portion of the overall study area between Keele Street and Bathurst Street. Similar to the Greenbelt Plan, the NVNCTMP will strive to minimize disturbance and respect the land and its key natural heritage features.

2.1.1 GTA West Corridor Environmental Assessment Study

The Ontario Ministry of Transportation (MTO) initiated a study to review transportation infrastructure needs to address long-term projected growth identified in the Provincial Growth Plan for the GGH and inter-regional transportation problems and opportunities. The project, referred to as the Greater Toronto Area West (GTA West) Corridor Study, identified a preliminary study area which spanned parts of York Region (along the northern boundary of the City of Vaughan), Peel Region, Halton Region, County of Wellington and the City of Guelph. The study is being undertaken as an Individual EA in accordance with the *Ontario Environmental Assessment Act* (OEAA).

In December 2015 the study was put on hold and subsequently in February 2018 the province announced that it will not proceed with an EA for a proposed highway in the corridor. However, the announcement also identified the corridor is still being protected for future infrastructure needs, such as utilities, transit, or other transportation options through the ongoing Greater Golden Horseshoe Transportation Plan. The Northwest GTA Corridor Identification Study Area identified in February 2018 is illustrated in **Exhibit 2-1**.

Ontario 2018 Fall Economic Statement released in November 2018, stated the province would initiate the work necessary to resume the Environmental Assessment for the GTA West Highway Corridor, which was suspended in 2015.

The City of Vaughan should continue to plan and protect for this corridor and engage with the MTO on the planning work for this corridor to gain clarity on its potential impacts to the NVNCTMP study area.

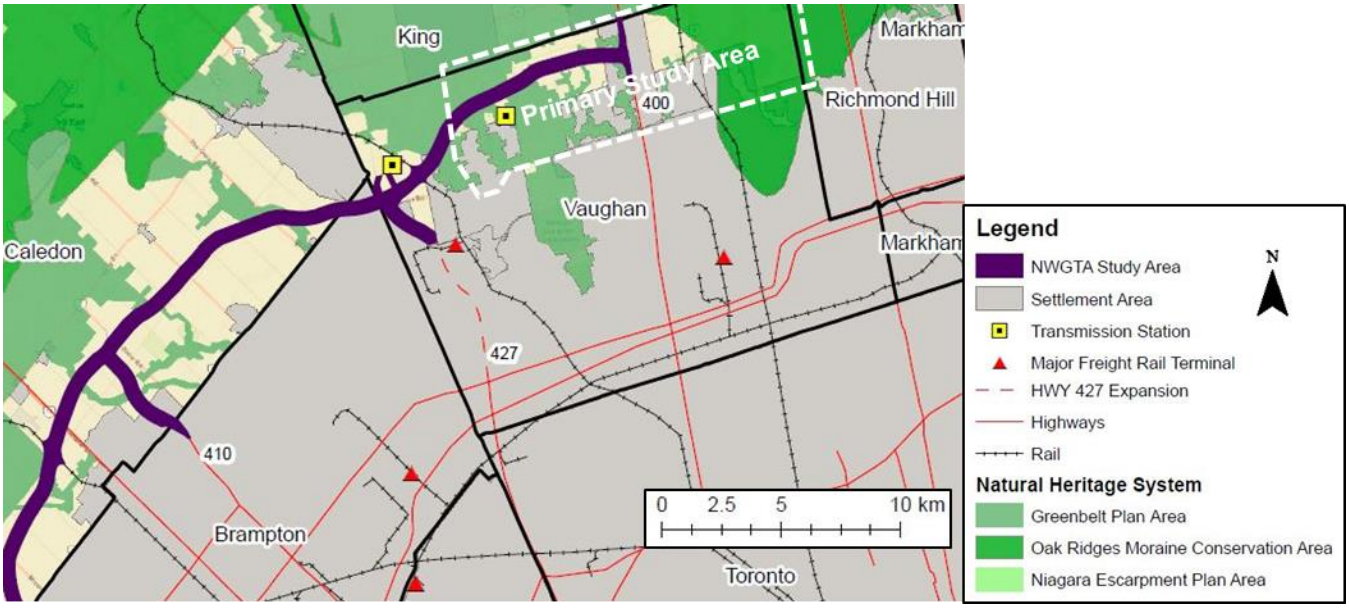


Exhibit 2-1: Northwest GTA Corridor Identification Study Area
Source: Ministry of Transportation Ontario, February 2018

2.1.2 Highway 400 Widening

The Ministry of Transportation is also planning the widening of Highway 400 from Major Mackenzie Drive to King Road from 6 lanes to 8 lanes, including new high occupancy vehicle (HOV) lanes. This widening is identified in MTO's 2017-2021 Southern Highways Program for construction completion in 2020.

2.2 Regional Context

2.2.1 Regional Transportation Master Plan (November 2016)

York Region's Transportation Master Plan (YRTMP) addresses the Region's mobility needs to 2041. 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 YRTMP 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
5. Make the last mile work

Key policies are identified under each of the YRTMP's objectives, which provide guidance to the NVNCTMP, and are summarized in **Table 2-2**.

Table 2-2: YRTMP Key Policy Directions and Impact to the NVNCTMP

Objective	Key Recommended Policies	Impact / Benefit to North Vaughan
Creating a world class transit system	**P2**: Provide opportunities for residents to park their vehicles on the fringes of urban areas and access different methods of travel for part of their trips, including transit or car sharing **P7**: Continue to advocate for increased GO bus services on Highways 404 and 400 in combination with the implementation of High Occupancy Vehicle (HOV) or High Occupancy Toll (HOT) lanes on these highways **P8**: Continue to work with GO Transit to inform and promote the use of integrated regional transit services	With the NVNCTMP study area on the fringe of the urban area, it can act as a gateway for more efficient methods of travel into the urban area. Improved and new connections with Hwy 400 GO bus services to Kirby GO Station or to carpool lots.
Develop a road network fit for the future	**P14:** Continue to require that when widening a road from four-lanes to six-lanes the additional lanes must be designated for HOV/Transit use **P17:** Provide financial assistance and support to local municipalities for mitigating/bridging barriers (watercourses, railways, etc.) in the major collector road network for new and existing development areas	The NVNCTMP should encourage higher occupancy travel in both transit and private autos to support the Region's development of an HOV/Transit network. Regional support for the development of the major collector road network.

Objective	Key Recommended Policies	Impact / Benefit to North Vaughan
Integrate active transportation in Urban Areas	**P24**: Collaborate with local municipalities as they develop and implement their own plans to improve active transportation **P25**: Regional trails should be designed and developed to a high standard, consistent across York Region, forming a network of safe and comfortable trails for multiple active transportation users **P26**: The Region will assume responsibility for planning, design, construction, operation and ownership of boulevard elements within Regional rights-of-way, including sidewalks, cycling facilities, illumination and streetscape design **P27**: Prepare a strategy to allocate development charges levied for constructing in boulevard infrastructure along Regional roads to the level of government responsible for the construction	Trail system planning should integrate with Regional plans. With Regional responsibility on Regional roads, NVNCTMP should build on York TMP recommendations for active facilities on Regional Roads, and plan for connectivity to the Regional network.
Maximize the potential of employment areas	**P35**: Identify and protect a Regional Strategic Goods Movement Network on Regional Roads, especially near intermodal facilities where feasible **P36**: Continue to recognize the importance of efficient movement of goods to the economic prosperity of the Region	NVNCTMP recognizes the importance of the Regional Goods Movement Network, and ensure the efficient movement of goods through the Study Area.
Make the last mile work	**P45**: Collaborate with one or more local municipalities and Metrolinx to refine and demonstrate the concept of "mobility hubs" or community spaces where intensive land uses are combined with the widest range of mobility options **P46**: Work with local municipalities to proactively review ways to make existing communities more complete through interventions addressing both land use and transportation systems **P47**: Support implementation of requirement for new community areas to have a development mix, density and design that supports short trips, offers attractive environments for walking, cycling and transit users and minimizes surface parking **P48**: Support implementation of mobility plans required for new community areas to ensure connected, accessible, multimodal transportation networks that prioritize access and circulation for walking, cycling and transit users.	Metrolinx's identification of the Kirby GO Station is an opportunity to demonstrate the concept of mobility hubs in accordance with these policies, addressing land use, built form, and emphasis on leveraging emerging technology-based mobility options.

Based upon the objectives and policies described previously, the YRTMP recommends an ultimate 2041 transportation network along with 2021, 2026, and 2031 phasing plans for transit, roads, active transportation and goods movement networks. Each of these networks is summarized in relation to the NVNCTMP study area in the exhibits in the respective sub-section of this report.

2.2.1.1 ROAD NETWORK RECOMMENDATIONS

The 2016 York Region TMP update has identified a number of road improvements within and surrounding the NVNCTMP Study Area and these are summarized in **Exhibit 2-2**. One of the primary recommendations impacting the NVNCTMP identified by the YRTMP is the Regional significance of Kirby Road (currently under jurisdiction of the City of Vaughan) as a frequent transit, vehicular traffic, cycling, and strategic goods movement corridor.

The NVNCTMP study will identify transportation network improvements building upon the Region's plans, particularly the collector road networks within Blocks 27 and 41 New Community Areas and the Highway 400 Employment Lands, and any potential refinements to the Regional network based on more detailed planning from the City's Secondary Planning process.

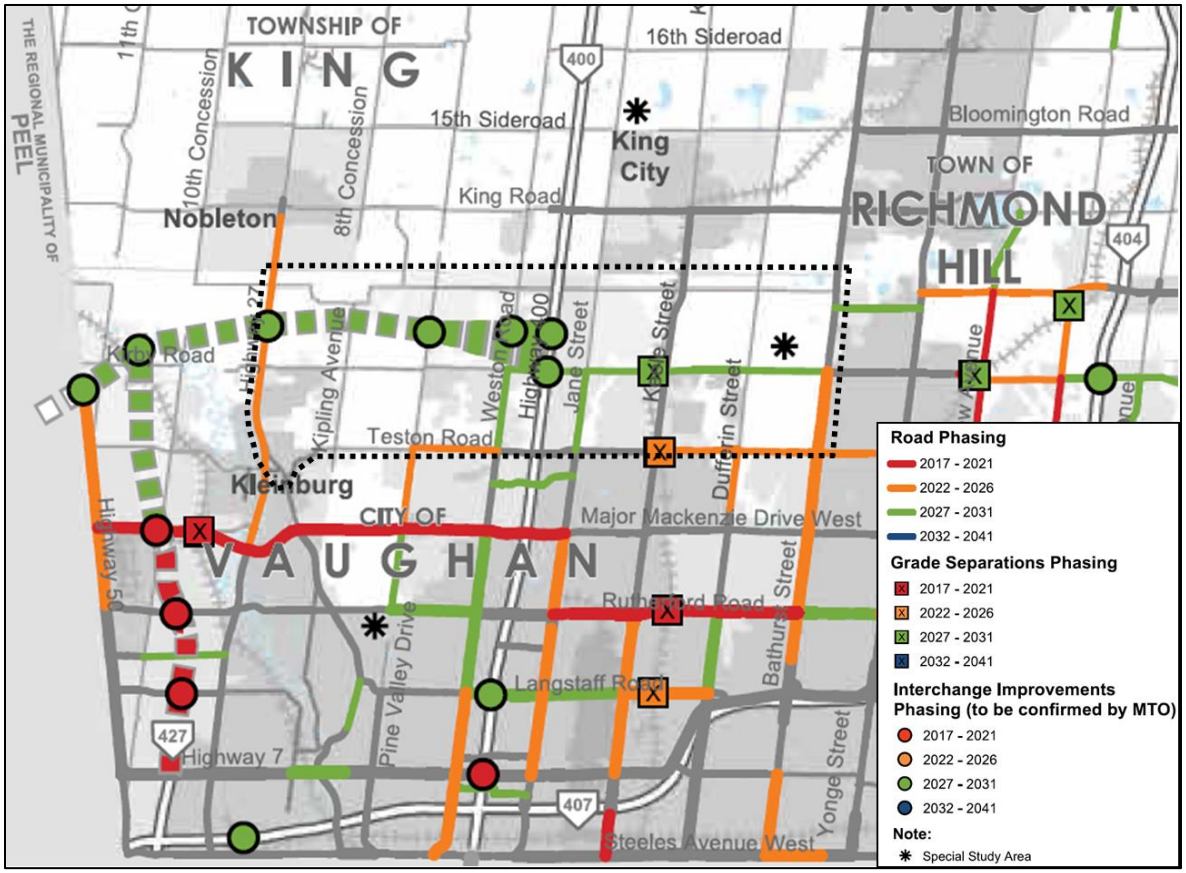


Exhibit 2-2: 2031 YRTMP Road Network
Source: York Region Transportation Master Plan 2016

2.2.1.2 TRANSIT NETWORK RECOMMENDATIONS

As identified in **Exhibit 2-3**, York Region is planning for frequent transit service on:

- Teston Road east of Pine Valley Drive
- Kirby Road east of Weston Road
- Along Pine Valley Drive south of Teston Road
- Weston Road, Jane Street, Keele Street, and Dufferin Street south of Kirby
- Bathurst Street from Newmarket all the way to Toronto through the eastern boundary of study area

This frequent transit service will connect the development of the New Communities and Highway 400 Employment lanes to the proposed Kirby GO Station, Vaughan Metropolitan Centre, the rest of Vaughan and the City of Toronto. The Viva Rapid Transit network including Yonge Street and the proposed Jane Street and Major Mackenzie Viva route will also be accessible to North Vaughan commuters through the frequent transit services. Frequent Transit Network service is defined as bus service every 15 minutes or less between 6AM and 10PM, seven days a week.

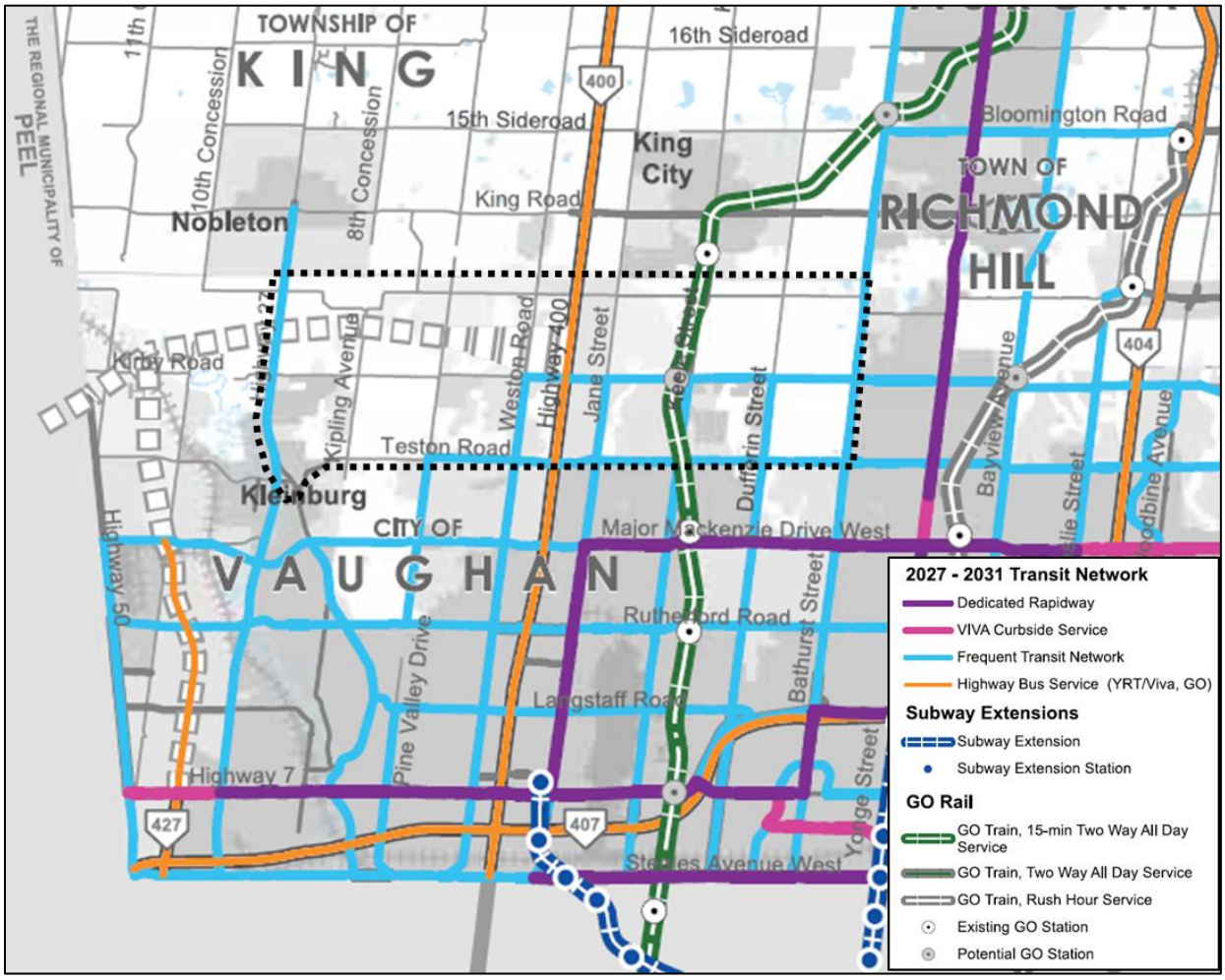


Exhibit 2-3: 2031 YRTMP Transit Network
Source: York Region Transportation Master Plan 2016

2.2.1.3 CYCLING NETWORK RECOMMENDATIONS

The York Region TMP 2016 recommends cycling infrastructure for a 10-year horizon and for a 25-year horizon. Within the NVNCTMP study area and for the 10-year horizon the TMP recommends dedicated infrastructure along Teston Road between Pine Valley Drive and Weston Road, as well as connections to fill the gaps along Keele Street and Bathurst Street. However, the 25-year plan proposes connections along all east-west regional roads within the study area, and along most of the north-south roads as shown in **Exhibit 2-4**.

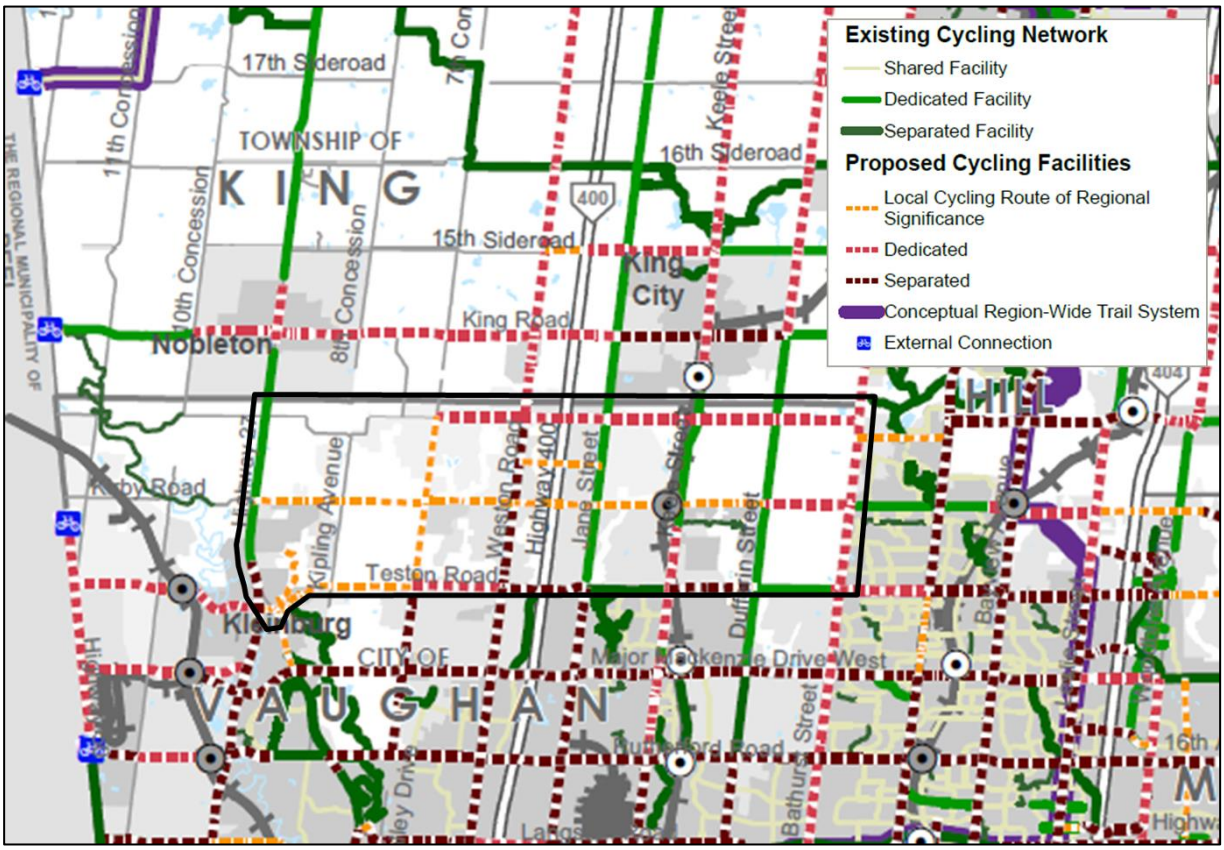


Exhibit 2-4: Proposed 2041 YRTMP Cycling Network
Source: York Region Transportation Master Plan 2016

2.2.1.4 GOODS MOVEMENT NETWORK RECOMMENDATIONS

York Region's Strategic Goods Movement Network provides a framework for future goods movement through the NVNCTMP Study Area. It consists of a hierarchy of corridors, identifying all freeways as Tier 1 corridors, strategic arterial roads as Tier 2 corridors (Highway 27 and Kirby Road through the NVNCTMP Study Area), and all other roadways as secondary goods movement corridors. The Region's Proposed Strategic Goods Movement Network is illustrated for the Study Area in **Exhibit 2-5**.

Specific implications for the NVNCTMP Study Area include the future design of Kirby Road which should accommodate heavy vehicles.

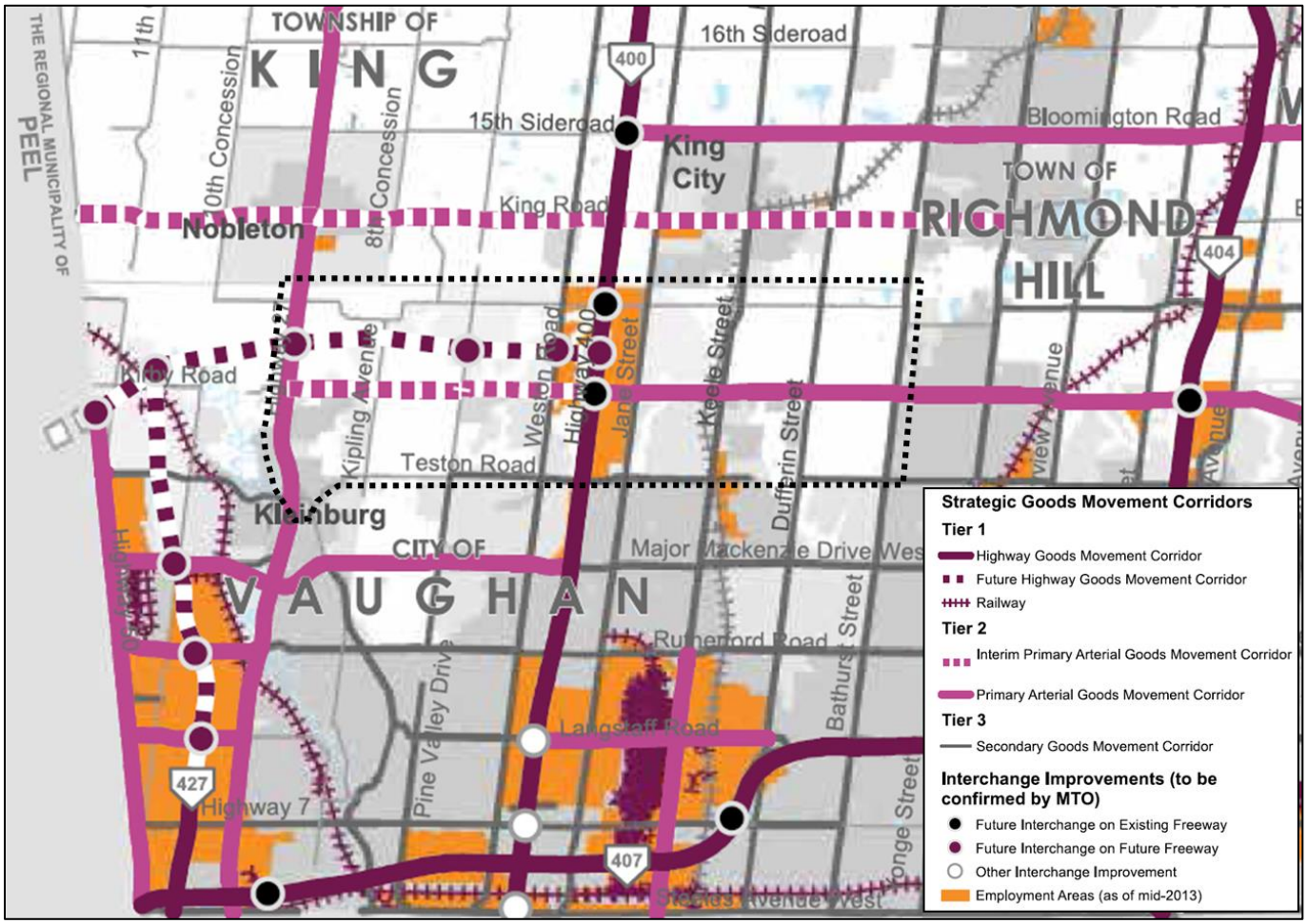


Exhibit 2-5: YRTMP Strategic Goods Movement Network
Source: York Region Transportation Master Plan 2016

2.2.2 2018 10 year Capital Roads and Transit Construction Program

York Region maintains a 10-year capital roads and transit construction program which identifies the timing of funded road construction, bridge replacements, intersection/interchange improvements, and VIVA network expansion projects by 2027. The 2018 10-year roads program for the study area is shown in **Exhibit 2-6**.

It is noted that some key Regional improvements that would be required to support the development of the New Communities, which are identified as 2022-2026 projects in the Regional TMP (**Exhibit 2-2**) are not included in the 10-year Regional Capital Program. These include improvements to Teston Road east of Keele Street including grade separation with the Barrie GO Rail line, construction of the Teston missing link, and widening to Bathurst Street.

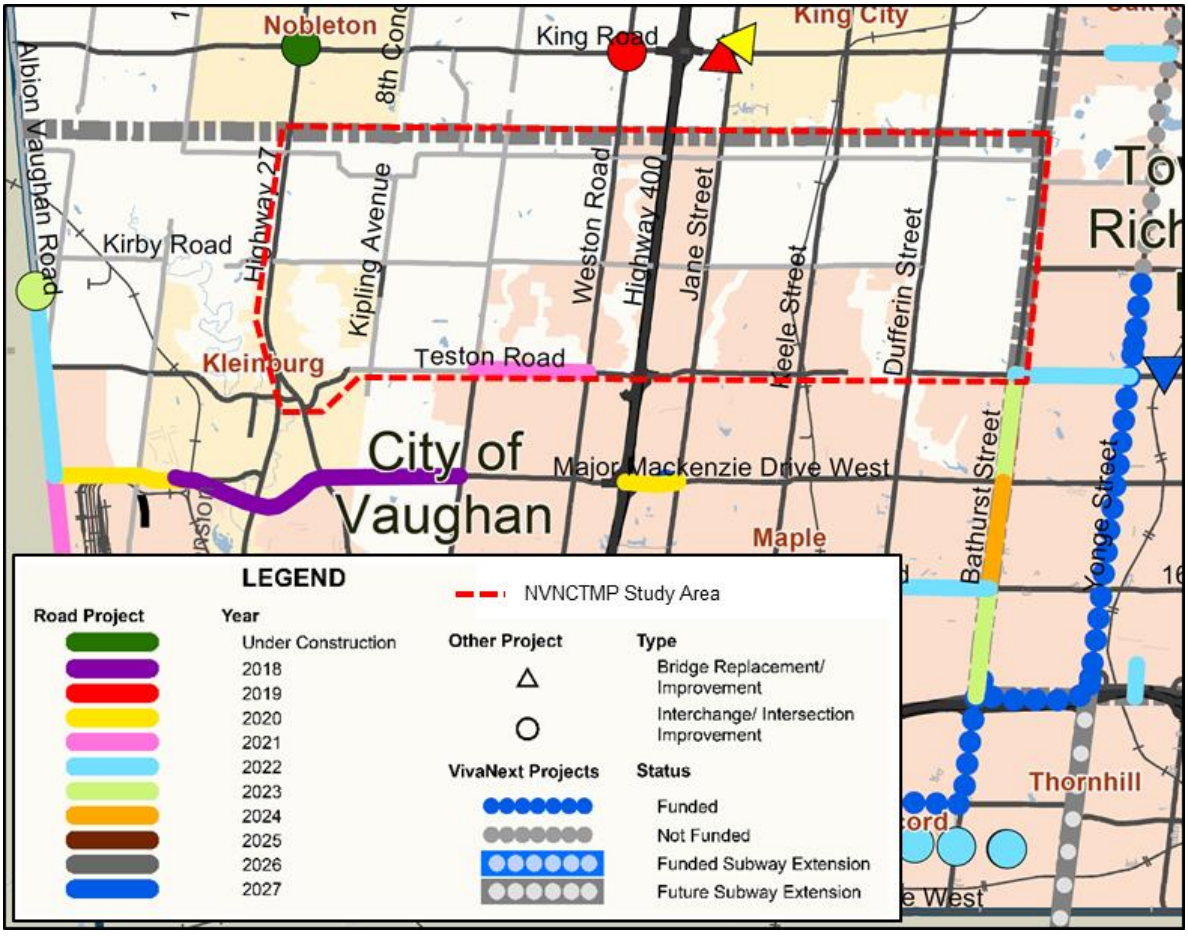


Exhibit 2-6: York Region 10 Year Roads and Transit Capital Construction Program
Source: York Region, 2018

2.2.3 York Region 2017 Development Charge Background Study

In March 2017, York Region released their 2017 Development Charge Background Study which identifies the anticipated development in York Region. It calculates the capital forecasts and development charge recoverable costs for water, wastewater, roads, transit, and general services.

York Region's 10-year Capital Plan and Transportation Master Plan were used to identify the 2017 to 2031 Capital program for the road projects. Projects included in the roads service component include grade separation, mid-block crossings, Highway 400-series interchanges and ramp extensions, road widening, road reconstruction, jog eliminations / intersection improvements, programs and studies, new arterial road links, and current projects.

The 2017 Development Charge Bylaw did not include 82 road projects (Region-wide) from the 2016 Transportation Master Plan which were placed on a contingent project list. The removal of these projects will be analyzed as part of a sensitivity analysis to inform the NVNCTMP in **Section 7.2.2**.

2.3 City of Vaughan Policy Framework

2.3.1 City of Vaughan Official Plan

The City of Vaughan Official Plan 2010 (VOP 2010) was approved by Council on September 7, 2010. The Plan was endorsed by Regional Council on June 28, 2012. VOP 2010 is part of a Growth Management Strategy "that will shape the future of the City and guide its continued transformation into a vibrant, beautiful and sustainable City."

The following policies, with VOP 2010 references in brackets, are of relevance to the study area:

- To establish a comprehensive transportation network that allows a full range of mobility options, including walking, cycling and transit (4.1.1.1).
- 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; and to facilitate walking and cycling and to promote convenience and connectivity (4.1.1.6).
- 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).
- To provide a minimum of 2 north / south and 2 east / west collector streets in new development where feasible, including grade-separated crossings of 400-series highways and rail corridors. The purpose of these streets will be to provide for local

travel between and within concession blocks without the necessity of traveling on arterial streets and to provide effective routing for transit vehicles. (4.2.1.23)

Schedule 9 and Schedule 10 in the VOP 2010 identify the City's Future Transportation Network and Major Transportation Network, respectively. 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. The NVNCTMP will recommend updating these Schedules for consistency with the latest Regional and provincial plans. Schedule 9 and 10 with reference to the NVNCTMP Study Area are illustrated in **Exhibit 2-7** and **Exhibit 2-8**. Some of the key transportation improvements include:

- Future Transportation Corridor (GTA West Corridor, renamed "Northwest GTA Corridor" in February 2018 but reverted back to "GTA West Corridor" in November 2018)
- Proposed collector road system in Highway 400 Employment Area (Refer to Highway 400 North Employment Lands Secondary Plan)
- Highway 400 road crossing north of Kirby Road (subject to the outcome of the Northwest GTA Corridor Identification Study and other future studies)
- Completion of the Kirby Road missing link between Dufferin Street and Bathurst Street.
- Planned Regional completion of the Teston Road missing link between Keele Street and Dufferin Street
- Jog eliminations at Jane Street and Kirby Road, Pine Valley Drive and Kirby Road, and Pine Valley Drive and Teston Road
- Grade separations along the GO Rail Barrie Corridor at Teston, Kirby and King-Vaughan Road subject to coordinated studies by Metrolinx, York Region and the City
- New highway interchange at Highway 400 and King-Vaughan Road subject to the outcome of the Northwest GTA Corridor Identification Study and a future Mid-York corridor study
- Regional Rapid Transit Corridor on Major Mackenzie Drive between Weston Road and continuing east into Richmond Hill (the latest York Region TMP identifies rapid transit only east of Jane Street)
- Kirby GO Station

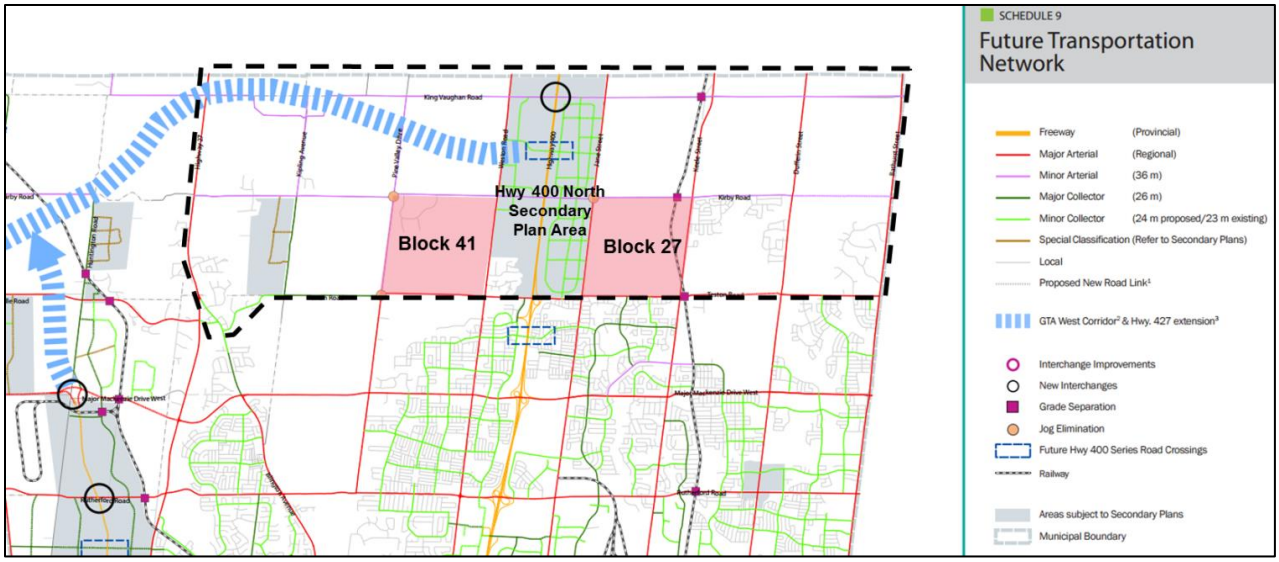


Exhibit 2-7: City of Vaughan Official Plan Schedule 9 – Future Transportation Network
Source: Vaughan Official Plan, October 2014 Consolidation

It is noted that the City's Official Plan reflects the previous potential alignment of the GTA West Corridor prior to the February 2018 announcement which has identified a narrower corridor protection area.

Exhibit 2-8: City of Vaughan Official Plan Schedule 10 – Future Transit Network
Source: Vaughan Official Plan, October 2014 Consolidation

2.3.2 Green Directions Vaughan

Green Directions Vaughan is the City's community sustainability and environmental master plan. It identifies actions to ensure the health, well-being and vitality of the community. In relation to the NVNCTMP, this plan provides direction to ensure that getting around Vaughan is easy and has a low environmental impact. The NVNCTMP will look to promote sustainable and active transportation in accordance with Green Directions Vaughan.

2.3.3 City of Vaughan Transportation Master Plan 2013: A New Path

The Vaughan Transportation Master Plan (VTMP) identifies City-wide transportation needs to the year 2031, including local improvements, strong Regional investments in transit service, and arterial road improvements, sidewalks, on-street and off-street bicycle facilities, and a mix of land uses. Within the NVNCTMP study area the timing of recommended improvements identified in the VTMP varies from the YRTMP recommendations given more up-to-date information on timing of development. Some of the key differences as they impact the overall study area are summarized in **Table 2-3**.

Table 2-3: VTMP Comparison to YRTMP Road Recommendations

Improvement	Extents	2012 VTMP Timing	2016 YRTMP Timing
King-Vaughan Road widening 2-4 lanes	Keele Street to Bathurst Street	2021	2041
Kirby Road widening 2-4 lanes and missing link	Keele Street to Bathurst Street	2021	2031
Teston Road widening 2-4 lanes and missing link	Keele Street to Bathurst Street	2021	2026
Major Mackenzie Drive widening 2-6 lanes	Highway 50 to Weston Road	2021	2021
Major Mackenzie Drive widening 4-6 lanes	Weston Road to Jane Street	2021	2021
Major Mackenzie Drive widening 4-6 lanes	Jane Street to Bathurst Street	2021	N/A
Highway 27 widening 2-4 lanes	King-Vaughan Road to Major Mackenzie Drive	2021	2026
Weston Road widening 2-4 lanes	Teston Road to Major Mackenzie Drive	2021	Complete
Dufferin Street widening 2- 4 lanes	King-Vaughan Road to Teston Road	2021	N/A
Dufferin Street widening 2-4 lanes	Teston Road to Major Mackenzie Drive	2021	2026
Block 33 Highway 400 midblock crossing	Weston Road to Jane Street	2021	2031
King-Vaughan Road widening 2-4 lanes	Highway 400 to Keele Street	2031	2041
Teston Road widening 2-4 lanes	Pine Valley Drive to Weston Road	2031	2026
Weston Road widening 2-4 lanes	King-Vaughan Road to Kirby Road	2031	2041
Weston Road widening 2-4 lanes	Kirby Road to Teston Road	2031	2031
Jane Street widening 2-4 lanes	King-Vaughan Road to Kirby Road	2031	2041
Jane Street widening 2-4 lanes	Kirby Road to Teston Road	2031	2031

The updated timing of improvements identified in the YRTMP will be confirmed through this study and discussed in **Section 9**. Additional City improvements identified in the VTMP will also be reviewed and confirmed and this includes the collector road networks in Blocks 34 and 35 and the potential Block 35 midblock crossing of Highway 400.

2.3.4 City of Vaughan Pedestrian and Bicycle Master Plan

The City of Vaughan adopted the Pedestrian and Cycling Master Plan in January 2007 and is currently being updated. The Plan has a 20-year horizon. The central intent is to guide

improvements to existing and proposed pedestrian and cycling infrastructure in order to create a friendlier environment for residents. The two central goals of the plan are:

- To create new environments and enhance existing ones for both pedestrians and cyclists in the City of Vaughan. These environments should be supported by developing a visible and connected pedestrian and cycling network in Vaughan that integrates, enhances and expands the existing on- and off-road pedestrian and cycling facilities.
- To facilitate an increase in walking and cycling for leisure and utilitarian purposes.

Cycling facilities in the study area were initially identified in the City's Pedestrian and Bicycling Master Plan and more recently updated for the City-wide TMP. Facilities in the study area include**:**

- East-west community multi-use recreational pathway (along the TransCanada Pipeline, further described below).
- Community paved shoulder bikeways (signed as Bike Route) along all major arterials.
- Community multi-use boulevard pathway along Teston Road from Pine Valley Drive to Bathurst Street.

These facilities are illustrated in **Exhibit 2-9** along with the Provincial Greenbelt Cycling Route York Loop, which passes through the study area.

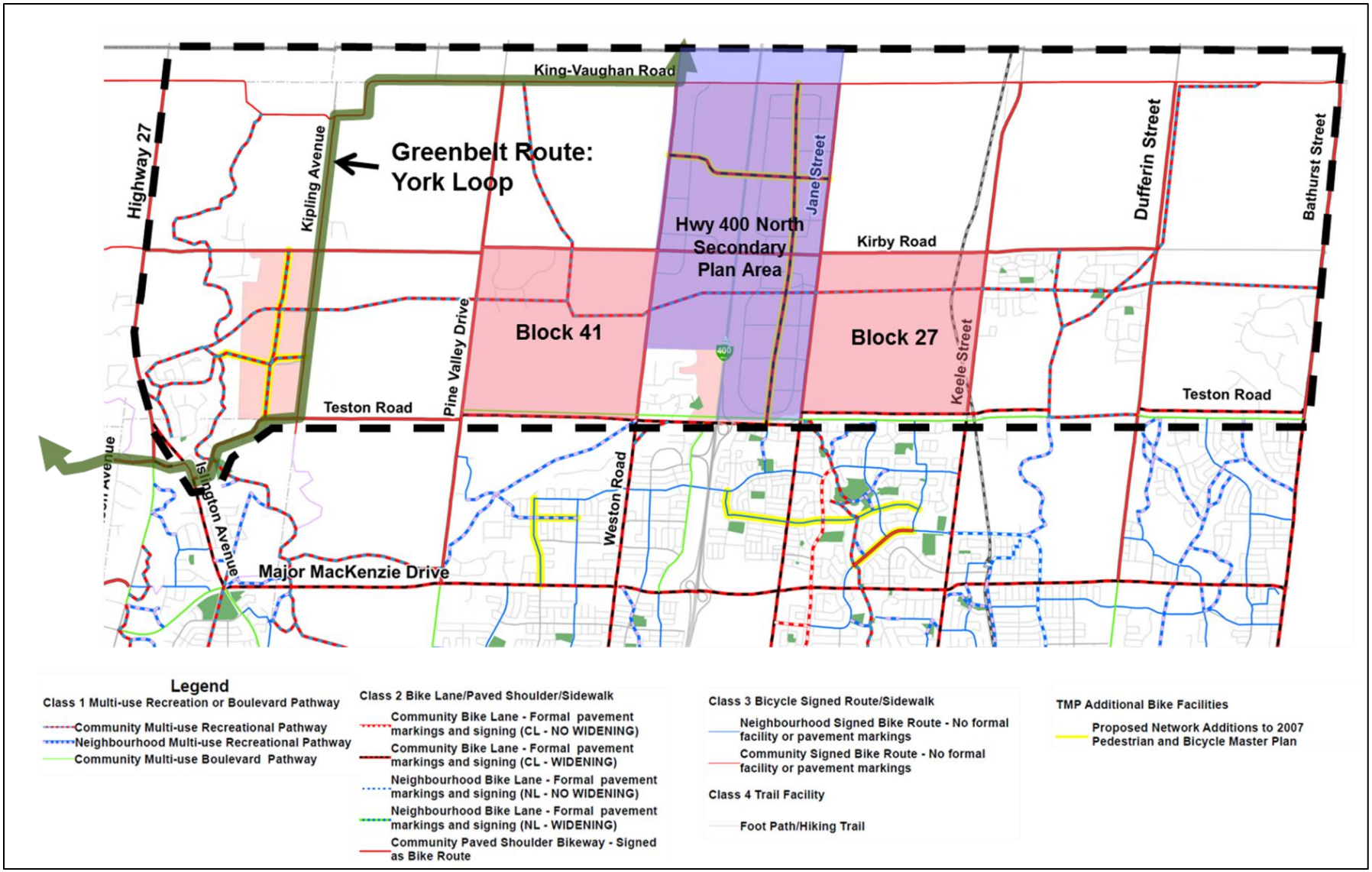


Exhibit 2-9: Planned Cycling Facilities in the Study Area
Source: City of Vaughan TMP 2012

In addition, the ongoing 2018 Pedestrian and Bicycle Master Plan update endorses the Vaughan Super Trail, a signature active transportation facility that links communities to one another, and increases accessibility for residents and visitors alike to important cultural, natural, heritage, and public space destinations

The following segments are proposed to be part of the Vaughan Super Trail and are within the study area:

- A trail running parallel to the TransCanada Pipline ("TCPL trail"), spanning between Highway 27 and just east of Keele Street;
- Extension of the Bartley Smith Greenway to the TCPL trail; and
- A segment from McNaughton northbound through the Keele Valley Lands and North Maple Regional Park, to the TCPL trail.

The overall proposed Vaughan Super Trail is illustrated in **Exhibit 2-10**, along with the trails that pass through the study area.

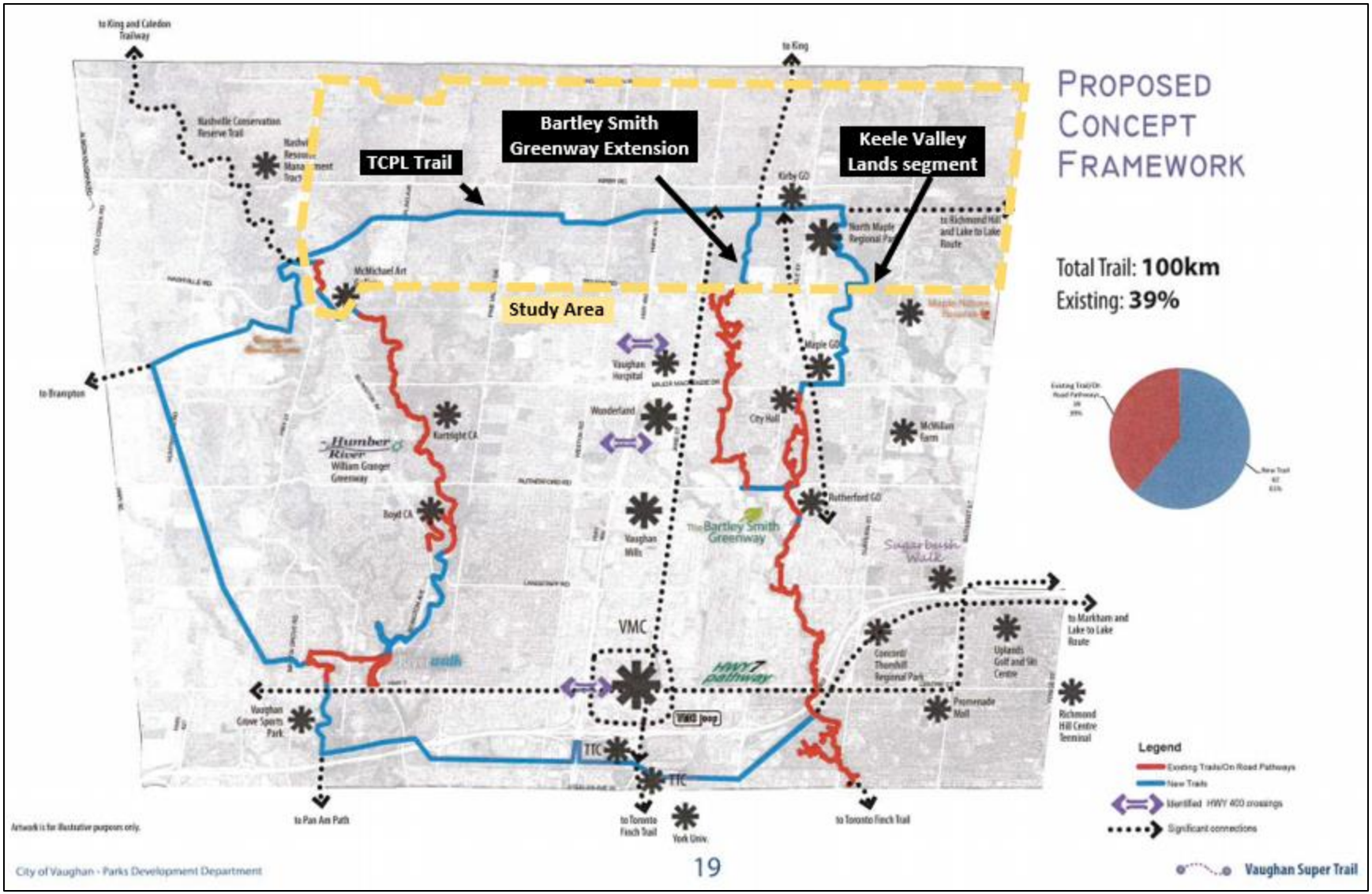


Exhibit 2-10. Proposed Vaughan Super Trail
Source: Connecting the Dots: The Vaughan Super Trail 2017

2.3.5 City Block Plans and Secondary Plans

The City of Vaughan has advanced the planning for specific growth areas through its block planning and Secondary Plan processes. The key plans influencing the NVNCTMP study area include Block 55 East, Block 40/47, and the Highway 400 North Employment Lands Secondary Plan. These plans are summarized in the following sections.

2.3.5.1 VAUGHAN BLOCK 55 EAST

Block 55 is located in the western part of the Study Area and directly east of the Kleinburg community (**Exhibit 2-11**). Block 55 is primarily composed of single-family detached residential and townhouse residential land uses. The preliminary transportation network for Block 55 includes:

- One north-south collector road connecting Kirby Road and Teston Road adjacent to the Hydro Corridor.
- Two new access points from Block 55 to Kipling Avenue.
- A mix of low and medium residential.

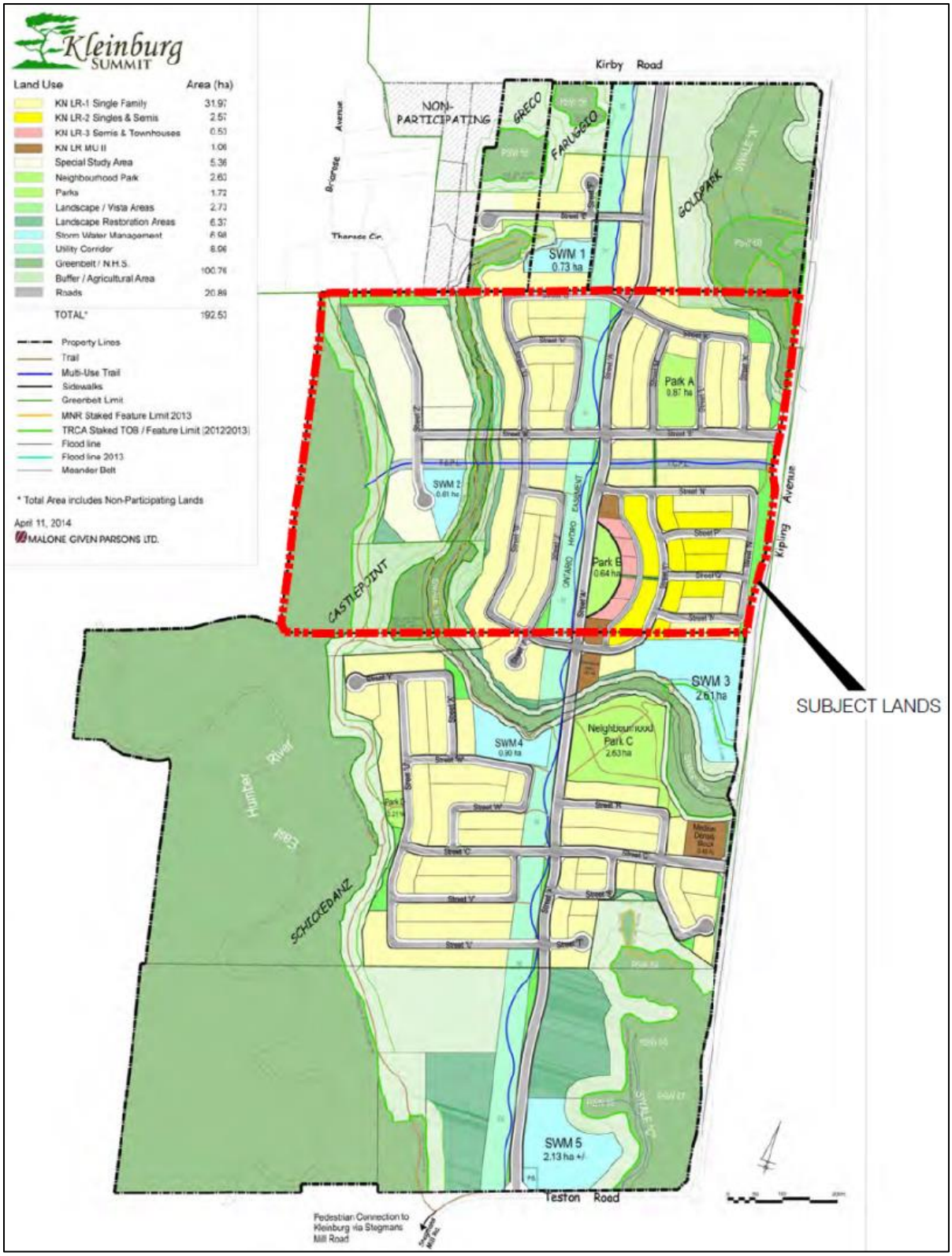


Exhibit 2-11: City of Vaughan Approved Block 55 Plan
Source: Approved Block 55 Plan September 2014

2.3.5.2 VAUGHAN BLOCK 40/47

The combined Blocks 40 and 47 are located south of the Primary Study Area, on the south side of Teston Road adjacent to the New Community of Block 41. **Exhibit 2-12** illustrates the planned land use which is comprised of low and medium density residential land uses. The transportation network supporting Block 40/47 includes:

- Three road connections between Block 40 and Teston Road. As per the guidance of the 2016 York Region TMP, connectivity across the Regional Road between Blocks is encouraged.
- A dense, grid street network supportive of active transportation and transit.
- The preferred alternative alignment for jog elimination of Teston Road at Pine Valley Drive as presented at Public Information Centre #2 of the Teston Road Environmental Assessment (Pine Valley Drive to Weston Road).

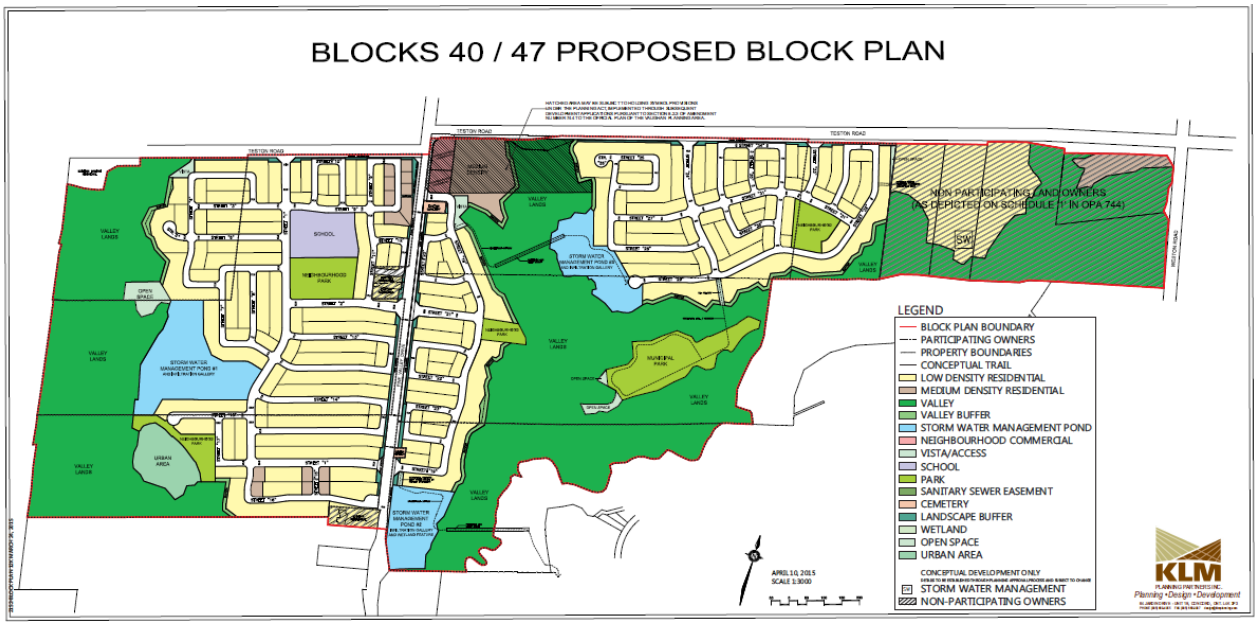


Exhibit 2-12: Block 40/47 Plan and Potential Connections to Block 41
Source: Proposed Block 40/47 Plan, April 10, 2015

2.3.5.3 HIGHWAY 400 NORTH EMPLOYMENT LANDS SECONDARY PLAN

The Highway 400 North Employment Lands (Block 34 and 35) are designated as future employment and are situated along Highway 400, encompassing the lands between Weston Road and Jane Street, and between Major Mackenzie Drive and the northern boundary of the City of Vaughan. The existing residential lands including the Rimwood community within Block 34 is excluded from the Secondary Plan area. The Land Use Plan for the Highway 400 North Secondary Plan is illustrated in **Exhibit 2-13**. The plan identifies lands primarily for prestige areas, prestige office and business campuses and general employment areas, with some lands designated as low rise residential and Employment / Commercial mixed use areas.

The Secondary Plan land use plan is supported by a transportation network consisting of:

- Four collector road connections at Jane Street in Block 34 which can provide direct connections to Block 27.
- A collector road connection at Weston Road in Block 34 which can provide a direct connection to Block 41. This road also extends northward through Block 35 up to King-Vaughan Road, with the potential for a collector road connection into King Township.
- A continuous north-south collector road, spanning the entirety of Block 34 and 35, meeting Teston Road at Mosque Gate, and extending north to King-Vaughan Road with the potential to extend further north into King Township.
- A continuous east-west connection across Highway 400 in Block 35. Due to significant environmental features west of Highway 400 in Block 34, the Secondary Plan did not identify a new east-west connection across Highway 400 in Block 34. Further, the lands in the west part of Block 35 including the potential midblock crossing are subject to the GTA West Corridor EA.

As per the Highway 400 North Employment Lands Secondary Plan, the limits of the Natural Heritage Network is to be confirmed through Block Plan. All attempts to avoid, mitigate, and compensate impact the NHN is to occur.

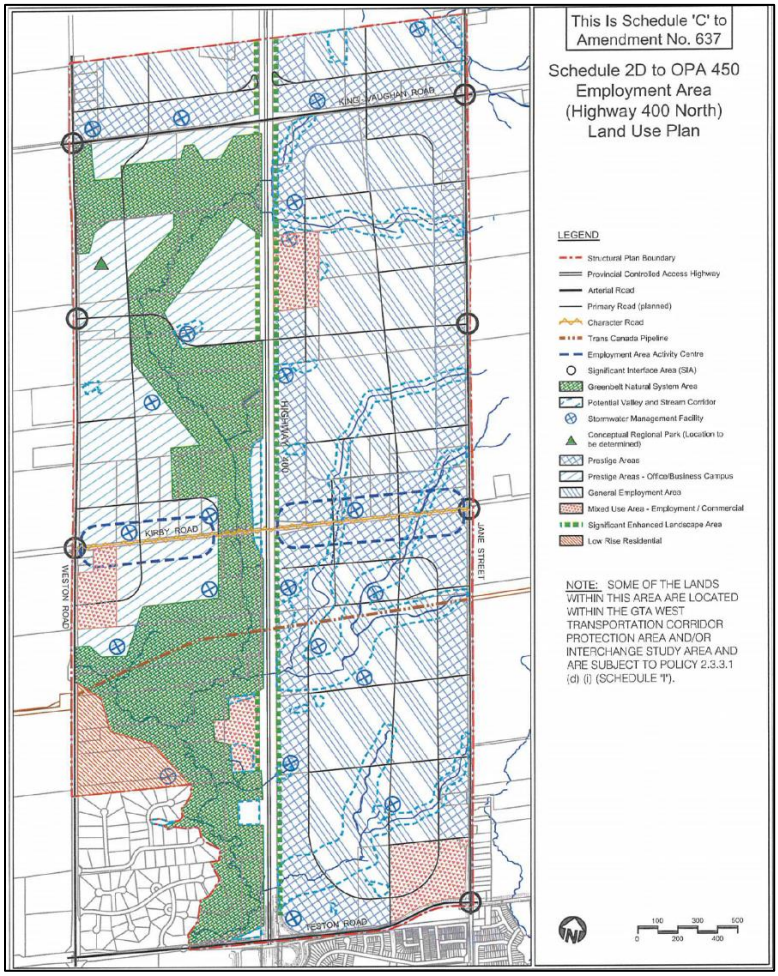


Exhibit 2-13: Block 34 and 35 Plan (Schedule 2D to OPA 450)
Source: Vaughan OPA 637, November 2011

2.4 North Maple Regional Park

The North Maple Regional Park was opened in September 2018 and is located adjacent to the Block 27 Secondary Plan area on the east side of Keele Street north of Teston Road. The park currently features 200 acres of open green space, two soccer fields with lighting and spectator seating, 5km of walking trails and a park pavilion with washroom and change room facilities. A future expansion will bring the park to 900 acres in total. Multimodal transportation connections between Block 27 and other surrounding areas are important to connect communities to this key destination in the study area.

2.5 Adjacent Municipalities

The NVNCTMP Study Area borders on King Township to the north and the Town of Richmond Hill to the east. The NVNCTMP study is coordinating closely with both King and Richmond Hill's transportation plans, and both municipalities are involved in the NVNCTMP's Technical Advisory Committee. Through a review of current plans, there do not appear to be any existing plans for municipal connections between these municipalities beyond the latest Regional improvements identified in the 2016 York Region TMP, which has already consolidated the recommendations of these municipalities along Regional Roads.

3 Public Consultation

Public consultation was carried out throughout the study, following Phases 1 and 2 of the Municipal Class EA process. Engagement with key stakeholders included landowners, community associations, governmental agencies, and indigenous peoples. Consultation activities included public notices, outreach at different community events, Stakeholder Workshops, technical advisory committee meetings, two Public Information Centres, and a project website. Public notices were sent out at appropriate times during the study. The following notices and their date of posting are summarized in **Table 3-1**.

Table 3-1: NVNCTMP Study Notifications

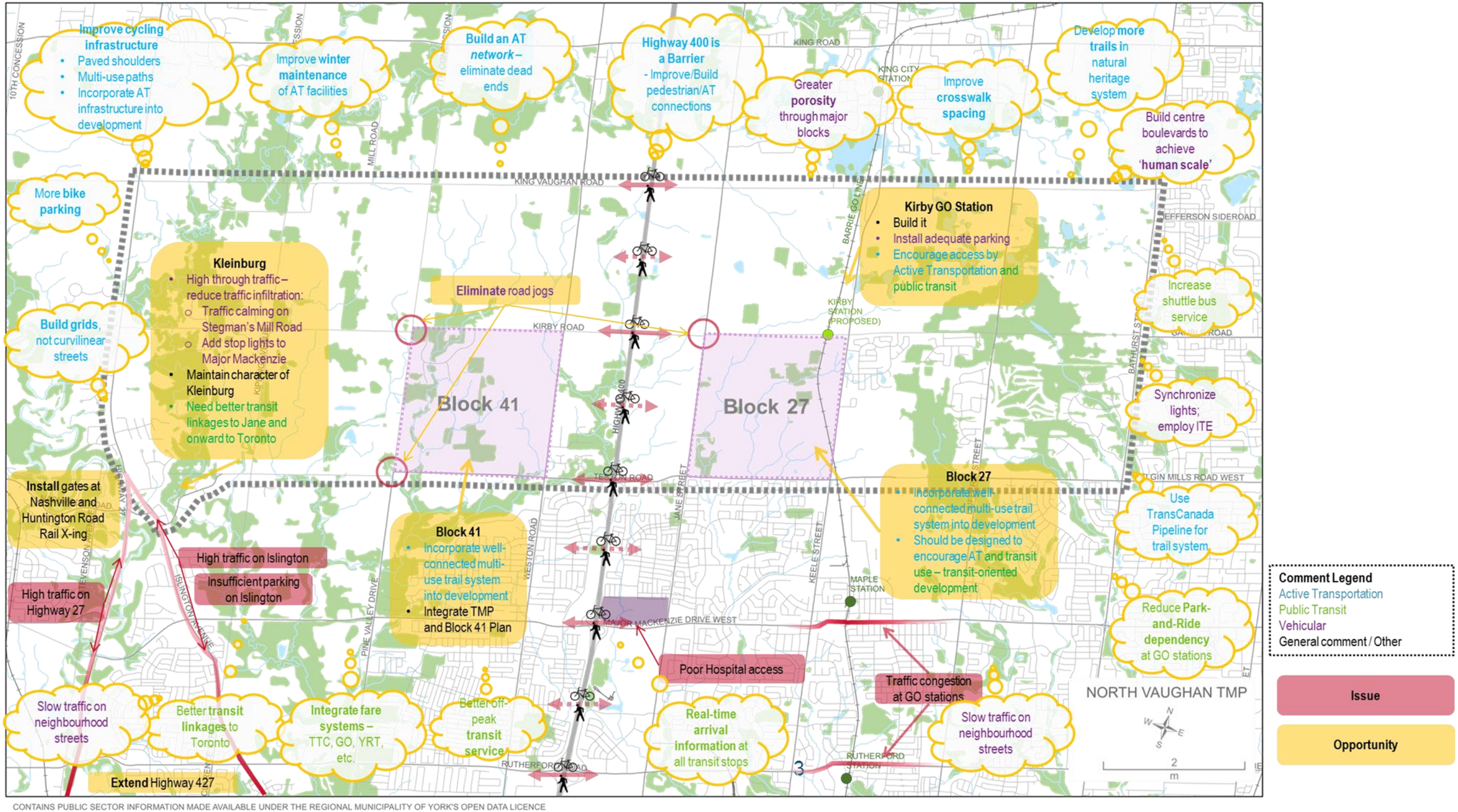
Notice	Notification Details
Notice of Commencement	• Issued in the Vaughan Citizen Newspaper on July 23, 2015 • Posted on project website www.nvnctmp.ca/
Notice of Public Information Centre #1	• Issued in the Vaughan Citizen Newspaper on October 1 and October 8, 2015 • Posted on project website www.nvnctmp.ca/
Notice of Public Information Centre #2	• Issued in the Vaughan Citizen Newspaper on March 23, 2017 and March 30, 2017 • Posted on project website www.nvnctmp.ca/
Notice of Completion	• Anticipated to be posted Winter 2019

A project website was developed for the study and was accessible at www.nvnctmp.ca. The website was updated at key points throughout the study. It provided members of the public and those interested in the study with information on the study background, project updates, interactive comment forms, public information centre display materials and the ability to contact the project team directly. An independent facilitator from Cumming and Company Limited supported the stakeholder workshop and Public Information Centre #1.

Feedback received during Phase 1 of the study was truly multimodal, reflecting the goals of the study. Stakeholders and residents alike expressed concern for traffic congestion and supported improving access to transit, improved active transportation linkages, and expressed a desire for the Kirby GO Station. A summary map documenting feedback provided in Phase 1 of the study is provided in **Exhibit 3-1**.

During Phase 2 of the study, a joint Public Information Centre was held with the Block 27 Secondary Plan. No comments specific to the TMP were received other than to express support for the Block 27 plans and the Kirby GO station.

Additional details on stakeholders and consultation events are provided as **Appendix C** to this report.



CONTAINS PUBLIC SECTOR INFORMATION MADE AVAILABLE UNDER THE REGIONAL MUNICIPALITY OF YORK'S OPEN DATA LICENCE

Exhibit 3-1: Public Consultation Feedback - Summary Map

4 Existing Conditions

This section provides an overview of existing conditions within the NVNCTMP Study Area. Data was obtained from various sources including Transportation Tomorrow Survey (TTS), York Region, MTO, Google Maps, and the City's own GIS and travel data.

4.1 Existing Transportation System

4.1.1 Road Network Context

The City of Vaughan is served by a grid-based road network. The majority of existing roadways within the Study Area are two-lane rural roads with minimal shoulder widths. **Exhibit 4-1** shows the existing road network, including the number of lanes, location of jogged intersections, missing links, freeway interchanges, environmental features, and planned developments within the study area.

Within the overall study area, Kirby Road and Teston Road are the two discontinuous east-west arterial roads with gaps between Dufferin Street and Bathurst Street, and Keele Street and Dufferin Street, respectively. King-Vaughan Road and Major Mackenzie Drive are the only two continuous east-west arterial roads between Highway 400 and the eastern limit of Vaughan. The distance between these two arterial roads is approximately 6.3 km. Commuters from the Town of Richmond Hill or eastern limit of the city need to travel along north-south arterial roads such as Bathurst Street and Dufferin Street to access either of these roads, causing significant peak hour congestion on these north-south arterials, as well as overloading traffic on King-Vaughan Road and Major Mackenzie Drive with long distance trips. Therefore, eliminating these gaps in the road network is critical to addressing traffic congestion in the study area.

Exhibit 4-2 highlights some of the critical street network gaps which include missing links and jogged intersections. In addition to the identified jogs and missing links, it is also noted that connectivity from the NVNCTMP Study Area to Peel Region is very limited due to the Nashville Conservation Reserve. Opportunities and impacts of eliminating some of the network gaps will be analyzed in this study.

As shown in **Exhibit 4-2**, not a single east-west arterial road traverses the northern part of the City of Vaughan through the NVNCTMP study area, which significantly limits connectivity west of Highway 27 with Peel Region and east of Bathurst Street with the Town of Richmond Hill. Notable network gaps include:

- King Road, north of the Study Area, ends at Yonge Street,
- King-Vaughan Road ends at 10th Concession and is jogged at Bathurst Street,
- Kirby Road ends at Highway 27, is jogged at Jane Street, and has a missing link between Dufferin Street and Bathurst Street,
- Teston Road is jogged through Kleinburg at Islington Avenue, is jogged at Pine Valley Drive, and has a missing link between Keele Street and Dufferin Street, and
- Major Mackenzie Drive is jogged at Highway 27, although York Region is currently eliminating the jog there.

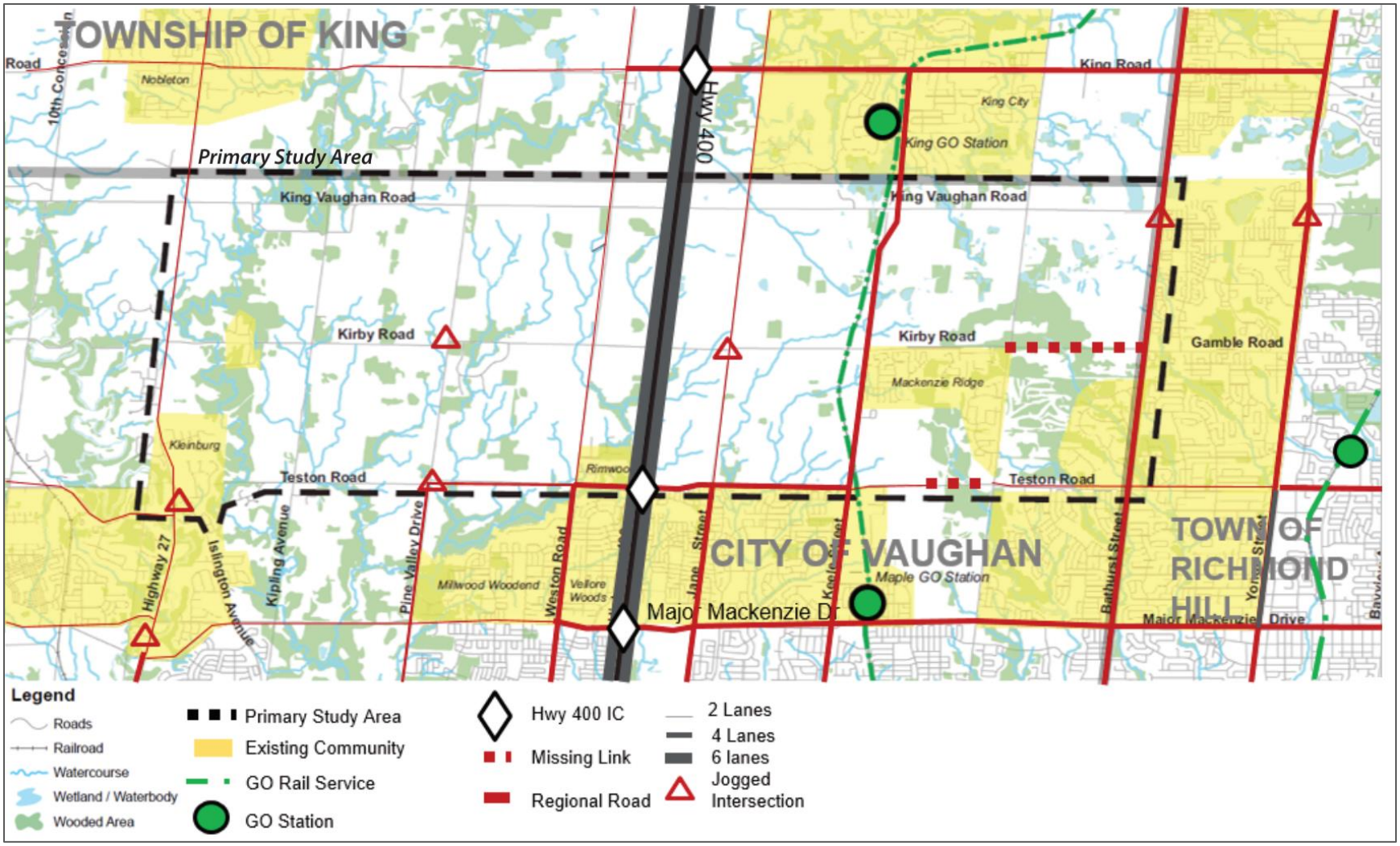


Exhibit 4-1: Existing Road Network

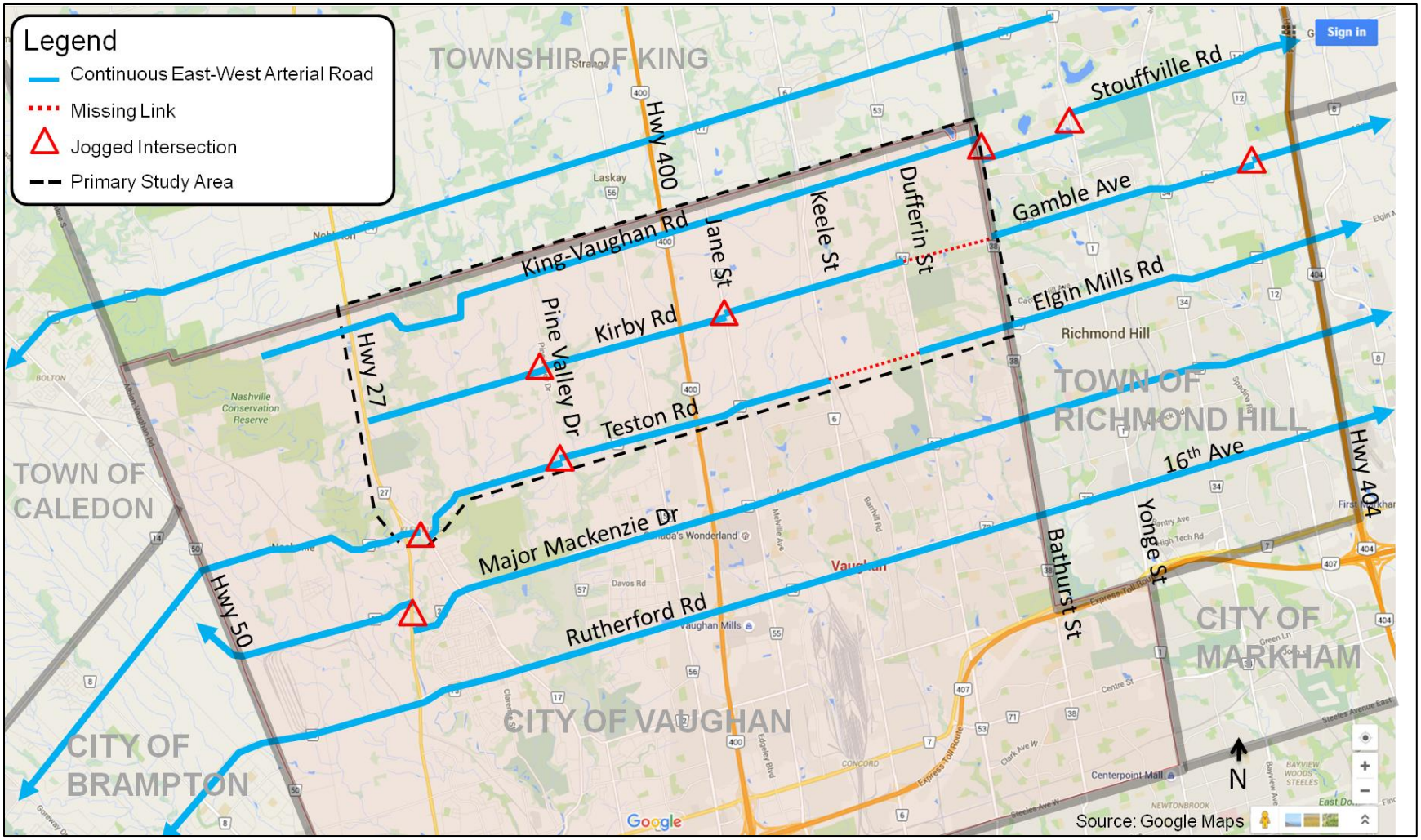


Exhibit 4-2: Transportation Network Gaps
Source: Google Maps

Improving east-west connectivity has been identified in previous studies by the City of Vaughan in the City-wide TMP study and York Region's 2016 TMP

Another issue identified with the road network is that the majority of the roadways within the Study Area are two lane rural roads with cross-section widths and vertical grades which do not meet the standard design criteria for their class of roadway. The existing road cross-sections lack shoulders and can have steep inclines. Two examples of such deficiencies are present at King Vaughan Road over Highway 400 (**Exhibit 4-3**) and Kirby Road under Highway 400 (**Exhibit 4-4**).

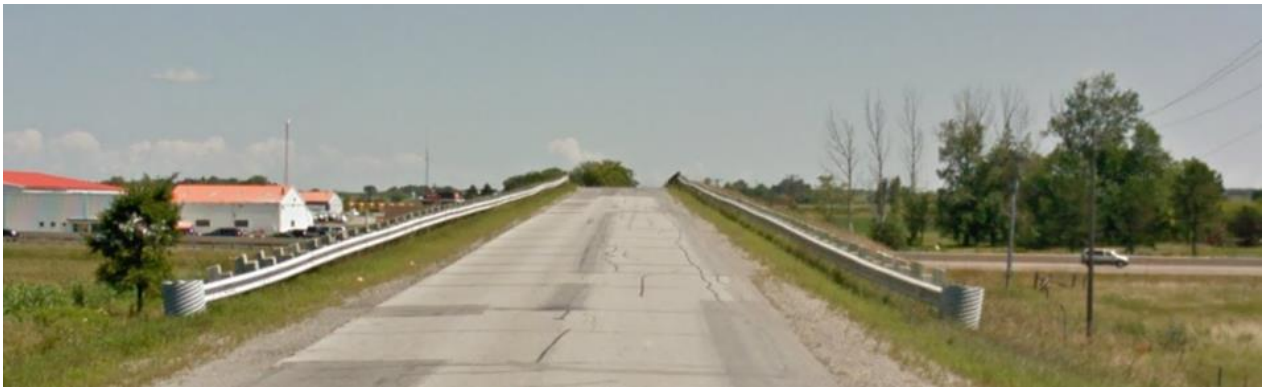


Exhibit 4-3: King Vaughan Road over Highway 400
Source: Google Maps

Exhibit 4-4: Kirby Road under Highway 400
Source: Google Maps

As identified by the public, there is a lack of space for pedestrians and cyclists for these crossings of Highway 400, particularly given the vertical grades which reduce sight distance. Future improvements to each of these roadways should consider widening the structure to allow for active transportation facilities in addition to vehicular capacity. According to the York Region TMP, both King-Vaughan Road and King Road are identified for improvements, by 2041, and by 2031, respectively.

4.1.2 Transit

The existing transit network (as of October 2018) that serves the study area and surrounding areas is presented in **Exhibit 4-5**. Some routes have been restructured as part of the Toronto-York Spadina Subway Extension, which includes transferring of operations between transit operators. The following bus routes operated by York Region Transit (YRT) serves the Primary Study Area:

- 13 Islington,
- 20 Jane,
- 22 King City,
- 96 Keele-Yonge (previously Route 22A King City),
- 107 Keele (previously 107D/F, operated by the TTC), and
- 88 Bathurst

A number of other YRT routes serve the existing neighbourhoods south of Teston Road within the Overall Study Area, and include:

- 4 Major Mackenzie,
- 21 Vellore Local,
- 26 Maple, and
- 165 F Weston (previously operated by the TTC).

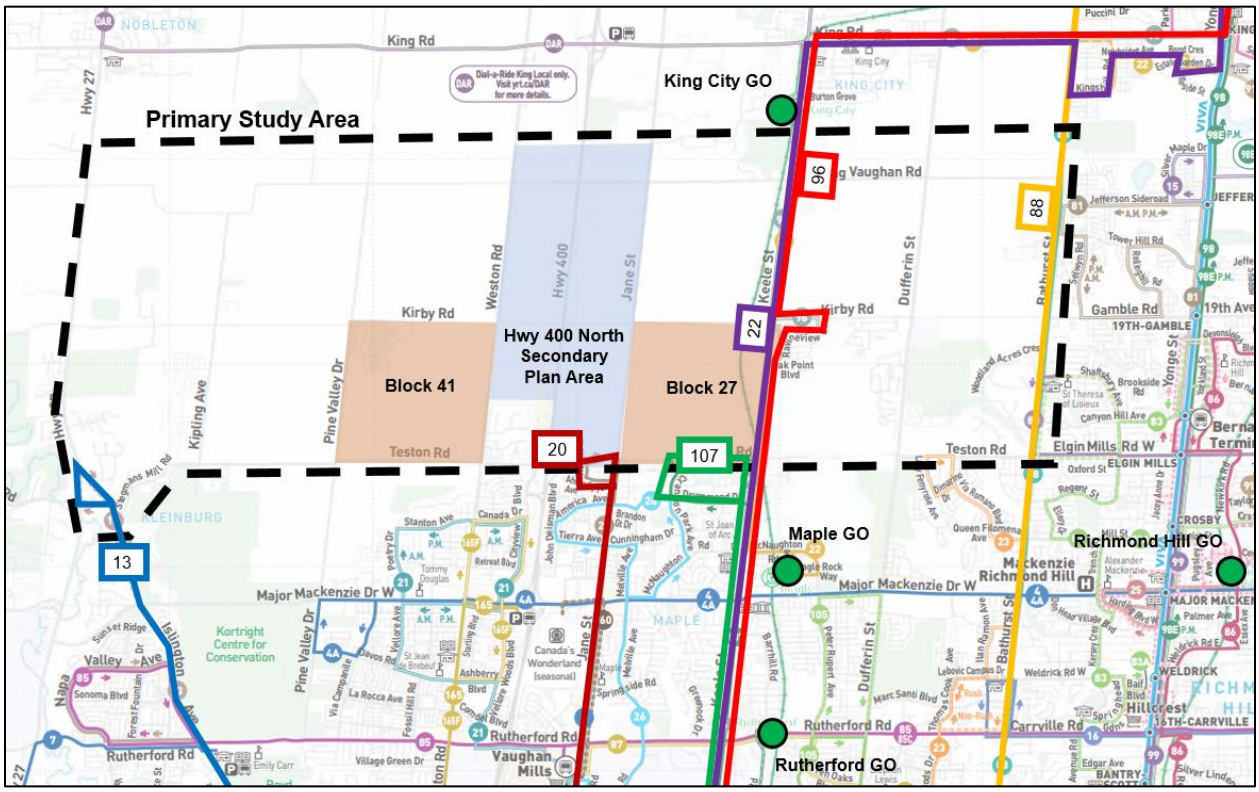


Exhibit 4-5: Existing Transit Service
Map Source: York Region Transit, September 2016.

In addition to bus transit service provided by YRT and TTC, the Barrie GO Corridor provides commuter rail service to the study area. Maple GO Station is located within the overall study area just north of Major Mackenzie Drive at Keele Street, King City GO Station is located just north of the study area, and Rutherford GO Station is located south of the study area. The Barrie GO line offers two-way commuter rail service to and from Toronto all week with approximately 30 minute service peak period peak direction and hourly service off-peak (December 2017). Hourly train service is provided throughout the day on weekends. GO Bus Route 63 supplements the train service during early morning and late evening hours. The bus service runs along Keele Street and Highway 400 and connects Rutherford, Maple and King City GO Stations to Union Station in the City of Toronto as shown in **Exhibit 4-6**.

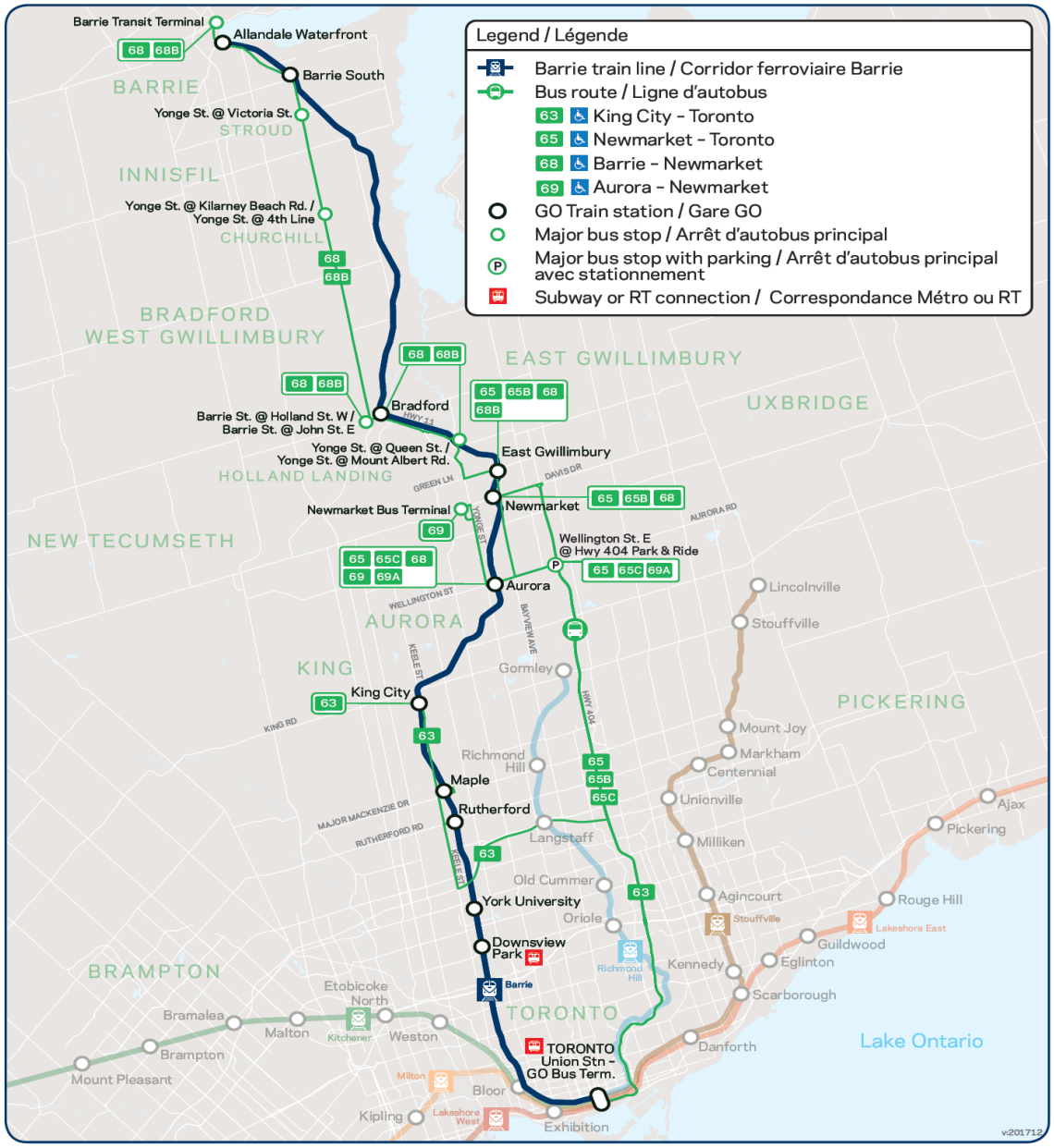


Exhibit 4-6: GO Bus (Green Line No. 63) and GO Rail Service (Blue Line) in the Study Area
Source: GO Transit Timetables, December 2017

4.1.3 Active Transportation

Due to the current rural nature of the study area and its location in the greenbelt, there are a limited number of active transportation facilities. The majority of infrastructure is provided through paved shoulders on Regional Roads or off-road cycling trails.

Exhibit 4-7 presents the current Regional cycling infrastructure, which is limited to paved shoulders suitable for biking on York Region's roads. In general, the roads in the study area, both those with and without paved shoulders, are primarily used at this time by experienced recreational cyclists.

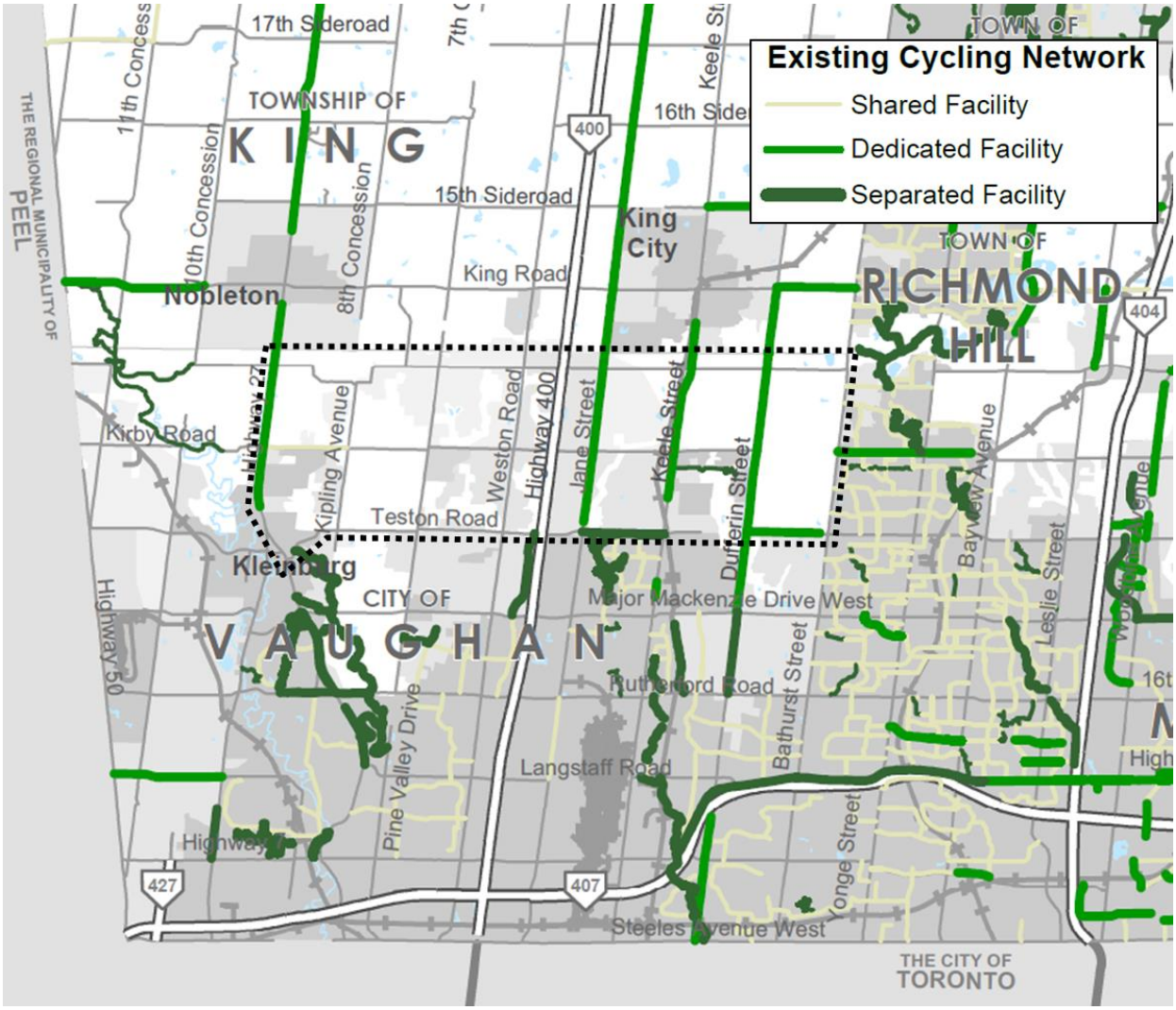


Exhibit 4-7: Existing Cycling Network
Source: York Region Transportation Master Plan 2016

It is also notable that the study area has access to the Greenbelt Route – a provincial recreational cycling trail that runs between Niagara and Northumberland. While the main spine of the Route runs through King Township to the north, an off-shoot of the Greenbelt Route, called the "York Loop," runs through the study area along Weston Road, across King-Vaughan Road, down Kipling Avenue, and through the Village of Kleinburg.

Pedestrian facilities are limited to the few residential enclaves that already exist in the study area. Of those, several lack both internal and external connectivity due to cul-de-sac street design, which increases trip distances. A disconnected street network affects all road users, but encumbers pedestrians and cyclists disproportionally due to their low travel speeds. Pedestrians and cyclists in general require more direct connections between origin and destination to make them viable travel modes. **Exhibit 4-8** shows the existing sidewalk facilities along the regional roads of the study area and highlights the existing gaps in the network.

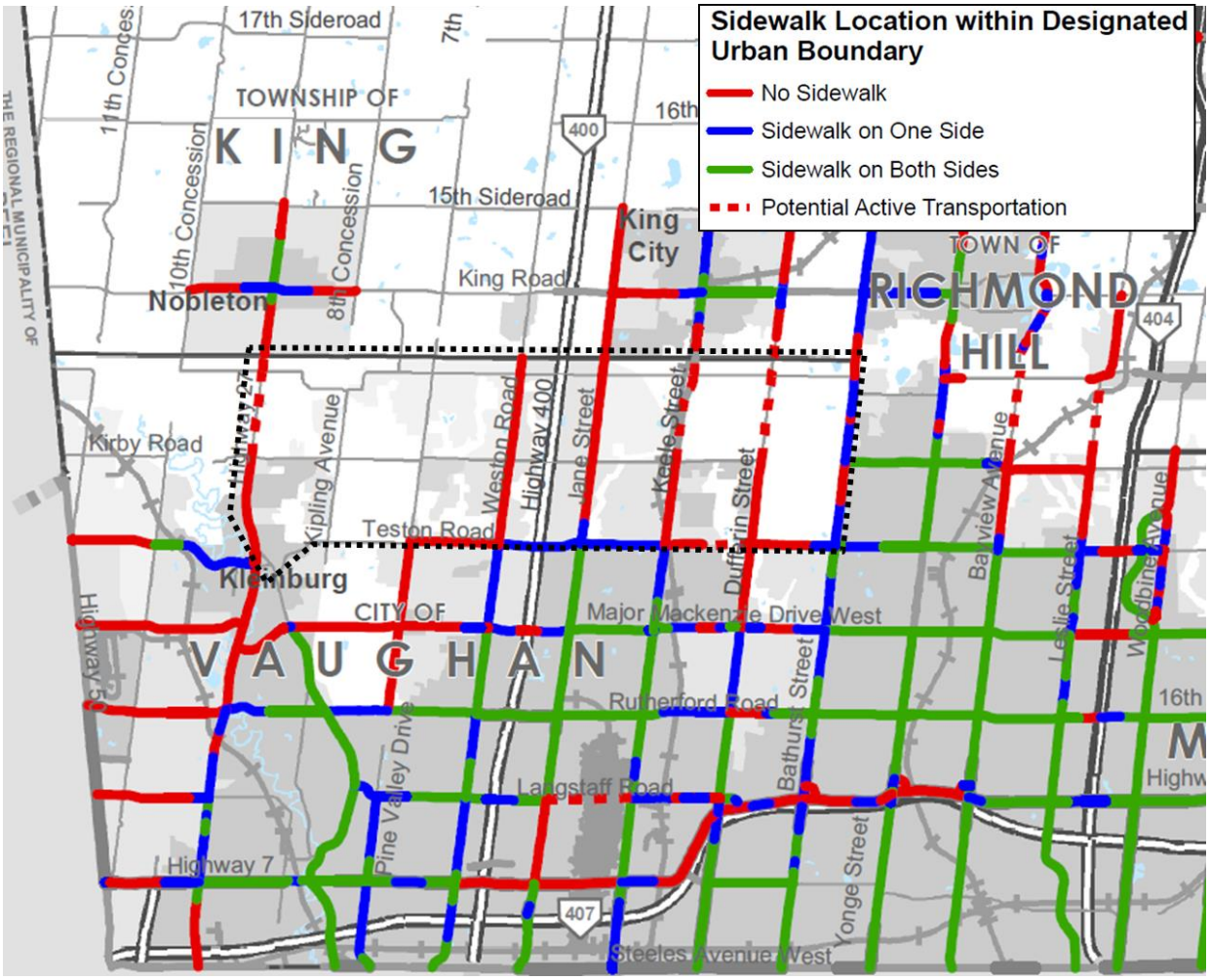


Exhibit 4-8: Existing Sidewalks and Gaps
Source: York Region Transportation Master Plan 2016

It is clear that through the development of the New Communities, there is an opportunity to eliminate the noted gaps alongside road improvements. In addition, the City of Vaughan has been increasing investment in pedestrian and bicycle facilities guided by its 2007 Pedestrian and Bicycle Master Plan and the on-going update.

4.1.4 Travel Demand Management (TDM)

The City of Vaughan requires that all new office and residential development applications include a Travel Demand Management (TDM) plan in order to obtain site plan approval. In addition, City Council and staff encourage local, city-wide and regional TDM programs. TDM

policies and programs include school travel planning and support for infrastructure measures, such as park-and-ride lots to facilitate the use of public transit and carpooling, and the incorporation of HOV and separated cycling facilities on 6-lane arterials.

Along with the City of Toronto, York Region, and Metrolinx, the City of Vaughan is a partner in Smart Commute-North Toronto, Vaughan; an award-winning Transportation Management Association. To achieve its goals of reducing traffic congestion and related air pollution and greenhouse gas emissions, Smart Commute promotes sustainable transportation options.

These include car- and vanpooling, public transit, cycling and walking, and telework. Individual commuters benefit from commuting assistance, trip planning and ride-matching tools, as well as promotional and educational events. Smart Commute also assists public and private organizations with the implementation of commute programs and campaigns.

4.2 Existing Travel Demand

As the majority of the Primary Study Area is currently rural, existing traffic volumes are generally low with peaks in the AM and PM peak hours carrying the commuter or “home-based work” trips. Major Mackenzie Drive, which is the southern boundary of the Overall Study Area, carries significant regional traffic to and from Highway 400 and is congested today, particularly due to the discontinuous east-west Kirby Road and Teston Road within the Study Area.

Vehicular traffic demand is summarized within this section, including traffic congestion based on screenline traffic to available capacity (v/c) ratios, intersection operations, local and GO transit demand, and commercial vehicles. A screenline is an imaginary line on a map that crosses numerous roads of interest. The rationale behind using this analysis for traffic capacity purposes lies in the fact that traffic often has the flexibility to divert to other parallel routes, so considering an entire screenline is beneficial in understanding broader, network wide traffic issues.

4.2.1 Land Use and Trip Generation

As of 2011, the NVNCTMP Study Area had a population of about 8,700 and employment of 1,900. This includes the communities of Kleinburg, Rimwood, and Mackenzie Ridge which are the primary trip generators within the study area. There are several major trip generators just outside of the study area including Vaughan Mills, Canada’s Wonderland, and the King, Maple, and Richmond Hill GO stations. These destinations result in “through” traffic passing through the study area that does not originate from or is destined to the area.

The following trip analysis presented is based on Transportation Tomorrow Survey (TTS) 2011 data. The TTS is a household travel survey conducted by phone across the Greater Golden Horseshoe area with a 5% sample size. It is conducted every 5 years to coincide with the Canadian Census by a research group (Data Management Group) at the University of Toronto.

The breakdown of trip purposes by time of day for the study area is provided in **Exhibit 4-9**. The majority of trips (45%) in the AM peak period are home-based work trips. A home-based work trip describes a trip that either starts or ends at home. The rest of the AM peak period trips are school trips (26%) and home-based discretionary trips (23%). Discretionary trips include all trips other than home-based work and home-based school trips (e.g. shopping, entertainment,

facilitating a passenger). Discretionary trips are also all the in-between stops that people make after work and before returning home, such as grocery shopping, going to the gym, picking up children from school, etc. During the PM peak period the share of work trips is substantially lower (24%) than in the AM peak period (45%). This share describes people that either work within the study area or are returning home, or it accounts for people who do not work typical business hours and are commuting to work in the PM peak period. The majority of trips (54%) in the PM peak period are discretionary.

Overall, throughout the day the majority of trips are home-based discretionary (44%) , followed by home-based work trips (31%) and school trips (14%), while non-home-based trips account for the least amount of travel (11%) from the study area.

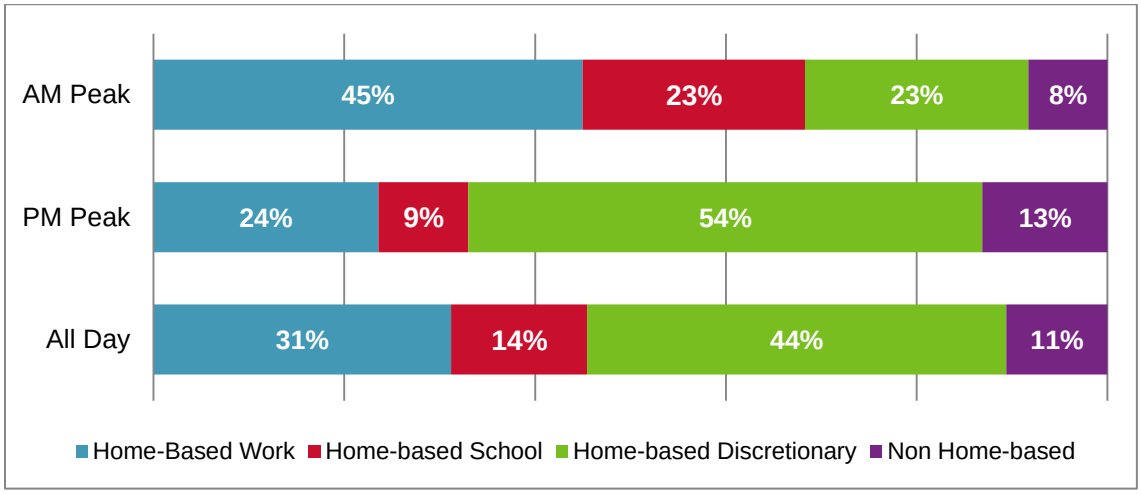


Exhibit 4-9: Trip Purpose with Origin from Study Area*
Source: Transportation Tomorrow Survey 2011
*(AM: 6AM to 8:29AM, PM: 3:30PM to 6:29PM)

As shown in **Exhibit 4-10**, during the AM peak period an equal share (31%) of study area commuter trips are destined to Vaughan and Toronto (excluding Downtown Toronto).

For all other trip purposes, the majority of trips stay within Vaughan (80% for discretionary trips, and 75% for school trips). The third most popular destination for any type of trips is the rest of York Region (excluding Vaughan).

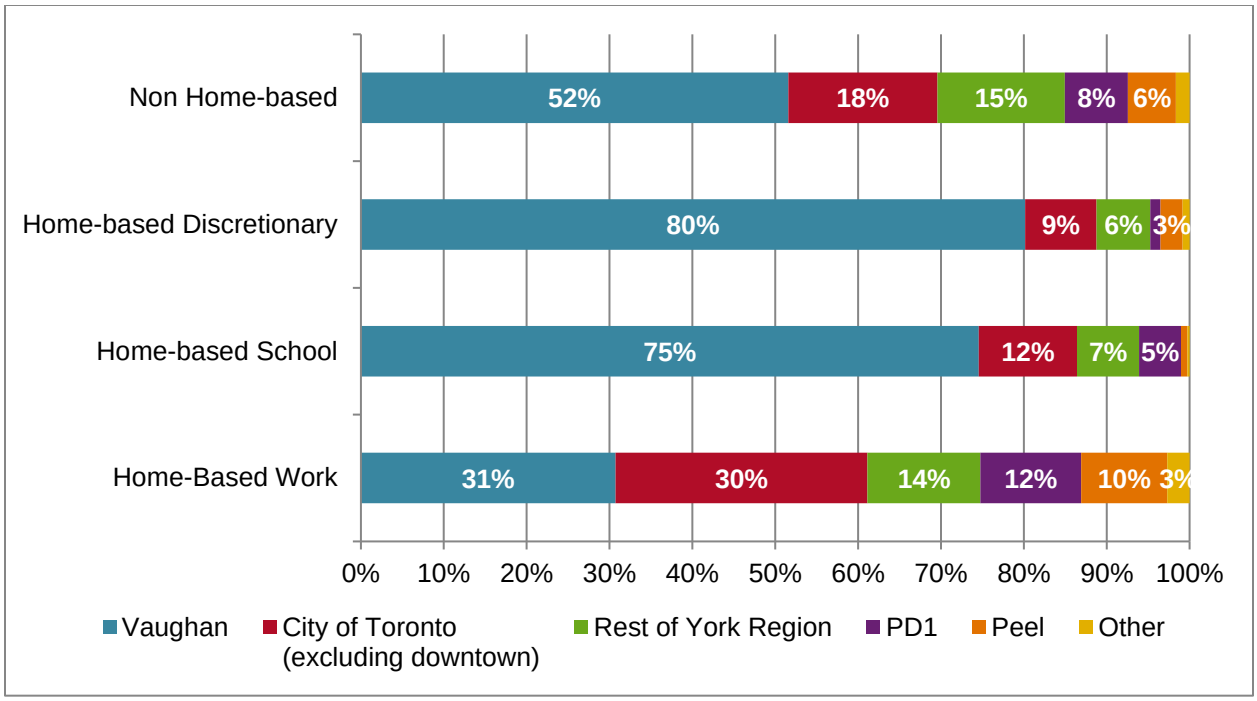


Exhibit 4-10: AM Trips (Origin from Study Area)
Source: Transportation Tomorrow Survey 2011

Exhibit 4-11 illustrates the breakdown of trip purposes and destination for the PM peak period. In the PM peak period, a large share of home-based work trips (25%) is destined to the rest of York Region which possibly captures York residents that work in Vaughan and are returning home. There is also a high rate of PM peak period home-based school trips that are destined to the City of Toronto, which captures York University students that either have afternoon classes or students that are returning home after their morning classes.

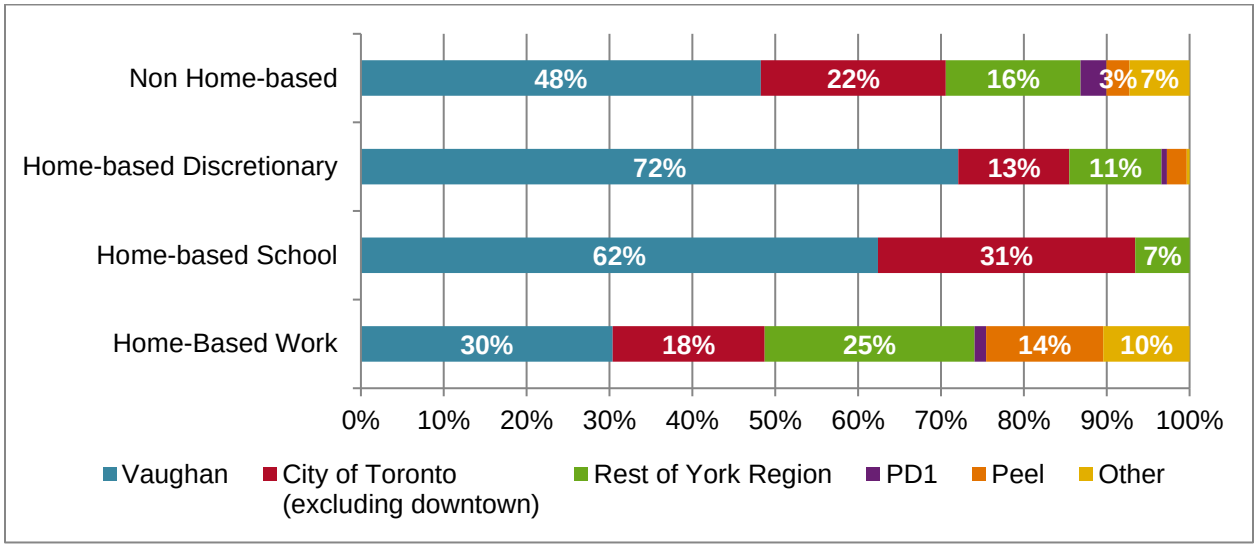


Exhibit 4-11: PM Trips (Origin from Study Area)
Source: Transportation Tomorrow Survey 2011

The location of the residential communities and other land uses within the study area in relation to the existing transportation network can be seen in **Exhibit 4-1**.

4.2.2 Travel Patterns and Mode Share

Currently, work trips originating in the study area during the AM peak period are predominantly destined to the City of Toronto (43% of the total), whereas only 31% remain in Vaughan. The remaining trips are evenly distributed to Peel / Halton (12%), King City and northern communities (4%), and the rest to York and Durham Region (10%). The distribution of travel is illustrated in **Exhibit 4-12**.

Exhibit 4-12: Distribution of Study Area AM Work Trips
Source: Transportation Tomorrow Survey 2011

Currently, the Primary Study Area is comprised of rural communities with 85% of work trips made as an auto driver, which is higher than the City of Vaughan overall auto drive mode share of 78%. As the Primary Study Area develops and is serviced with multimodal infrastructure and sustainable land use patterns, it is expected that the auto driver mode share would decrease closer to the City-wide share. 2011 TTS modal shares are summarized in **Table 4-1**.

Table 4-1: 2011 North Vaughan and the City of Vaughan Mode Share

Work Trip Mode Share	NVNCTMP Primary Study Area	NVNCTMP Overall Study Area	City Wide
Walk	0.0%	0.2%	0.7%
Cycle	0.0%	0.2%	0.2%
YRT/TTC	4.4%	5.8%	9.6%
GO	5.6%	5.8%	4.9%
Auto Passenger	5.3%	6.8%	7.1%
Auto Driver	84.7%	81.3%	77.6%

Source: Transportation Tomorrow Survey 2011

4.2.3 Traffic Screenlines

To assess the current level of traffic congestion on roadways throughout the study area, a link (road segment) and screenline volume-to-capacity analysis was conducted. The link volume describes the number of cars that pass through a certain segment of the network over a period of time and are collected through traffic counts in the field. These link volumes were divided by the capacity of the roadway to develop v/c ratios for each roadway link during the AM and PM peak hours. Road network conditions at the midblock or link level were also assessed using the v/c ratios. The volume-to-capacity ratio reflects peak hour traffic demand measured against roadway capacity. A description of the v/c ratios is provided in **Table 4-2**.

Table 4-2: Link V/C Ratios and Operating Condition

V/C Ratio	Level of Service (LOS)	Operating Condition
Less than 0.85	LOS A-C	Free-flow, very little to moderate delay
Between 0.85 and 0.99	LOS D-E	Approaching or at capacity, users experience delays and queuing
Greater than 1.00	LOS F	Over capacity, severe delays, and queuing

For a particular link, a v/c ratio of less than 0.85 represents free flow conditions in which little delay is experienced. Between 0.86 and 0.99, as the link reaches capacity, a moderate to high amount of delay is experienced. Above 0.99, the link is at capacity, and major delays and queuing are occurring consistently during the peak periods. The capacity of roadways within the study area are based upon the roadway type definitions from the York Region model and are a function of the existing roadway conditions including free-flow speed and density of access points.

Exhibit 4-13 shows the 2011 AM peak traffic flow directions and the screenline volume to capacity ratio of the respective east-west roadways. As shown in the graphic:

- Teston Road is heavily congested between Bathurst and Dufferin Streets in the westbound direction,
- Westbound traffic on Major Mackenzie Drive moves slowly, approaching roadway capacity, between Bathurst Street and Highway 400, and
- Major Mackenzie Drive is congested for both eastbound and westbound traffic between Jane Street and Highway 27.

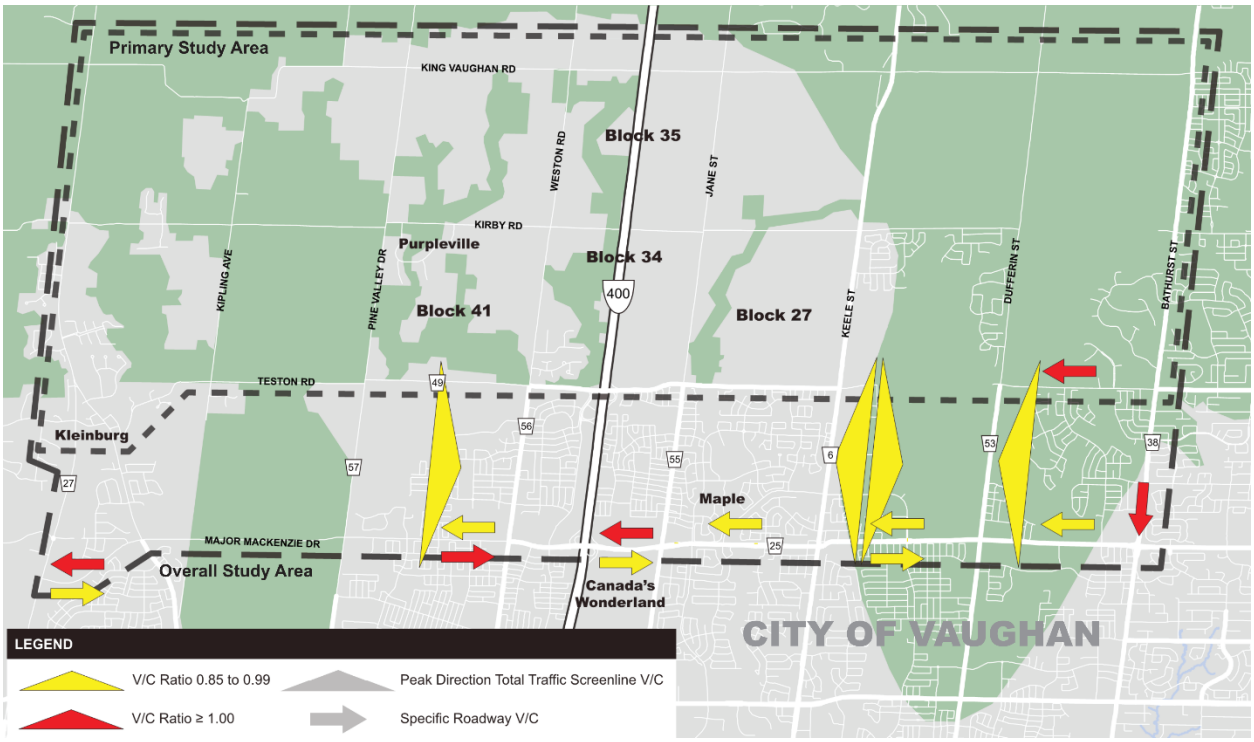


Exhibit 4-13: East-West Traffic Peak Direction AM Screenline V/C Ratios

Exhibit 4-14 summarizes the traffic conditions of the north-south roadways in the AM peak period.

- Southbound traffic is the peak directional flow during morning peak hour and northbound in the afternoon peak hour
- West of Highway 400, traffic volumes are low with the exception of Highway 27
- The Highway 400 corridor, including Weston Road and Jane Street is heavily congested
- Southbound traffic is approaching congestion at Teston Road
- Southbound traffic is very congested at Major Mackenzie Drive

A detailed summary of screenline traffic volumes for both existing and future is provided in **Appendix D - Transportation Analysis and Modelling**, along with a summary of traffic counts collected for the study and used in the Synchro intersection capacity analysis.

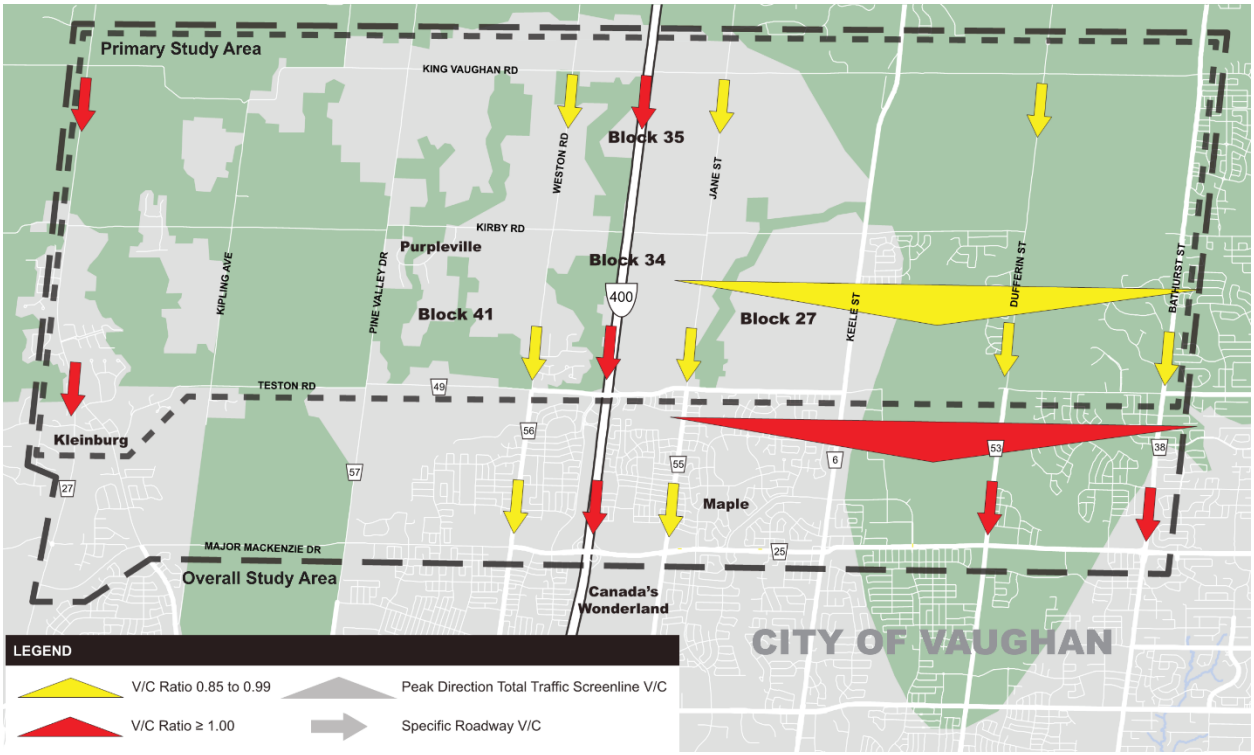


Exhibit 4-14: Existing AM Peak Hour North-South Traffic Screenline V/C Ratios

4.2.4 Link and Intersection Operations

Further to the screenline analysis which confirmed network-wide traffic issues, it remains beneficial to identify the traffic conditions on specific roadways by analyzing each segment of roadway in the study area. In addition to road segment analysis comparing traffic volume along a roadway link to roadway capacity (v/c ratio), intersection capacity analysis was also conducted to understand existing traffic operations at major signalized intersections.

Volume-to-capacity ratios and intersection level of service estimates based on existing conditions are illustrated for the entire study area in **Exhibit 4-15**.

Intersection operation analysis, using the modeling software Synchro, considers two separate measures of performance:

- The overall volume to capacity (v/c) ratio for each intersection. This ratio reflects peak hour traffic demand measured against roadway capacity, and
- The overall level of service (LOS) for each intersection. LOS is based on the average control delay per vehicle.

Detailed Synchro reports are provided in **Appendix D.**

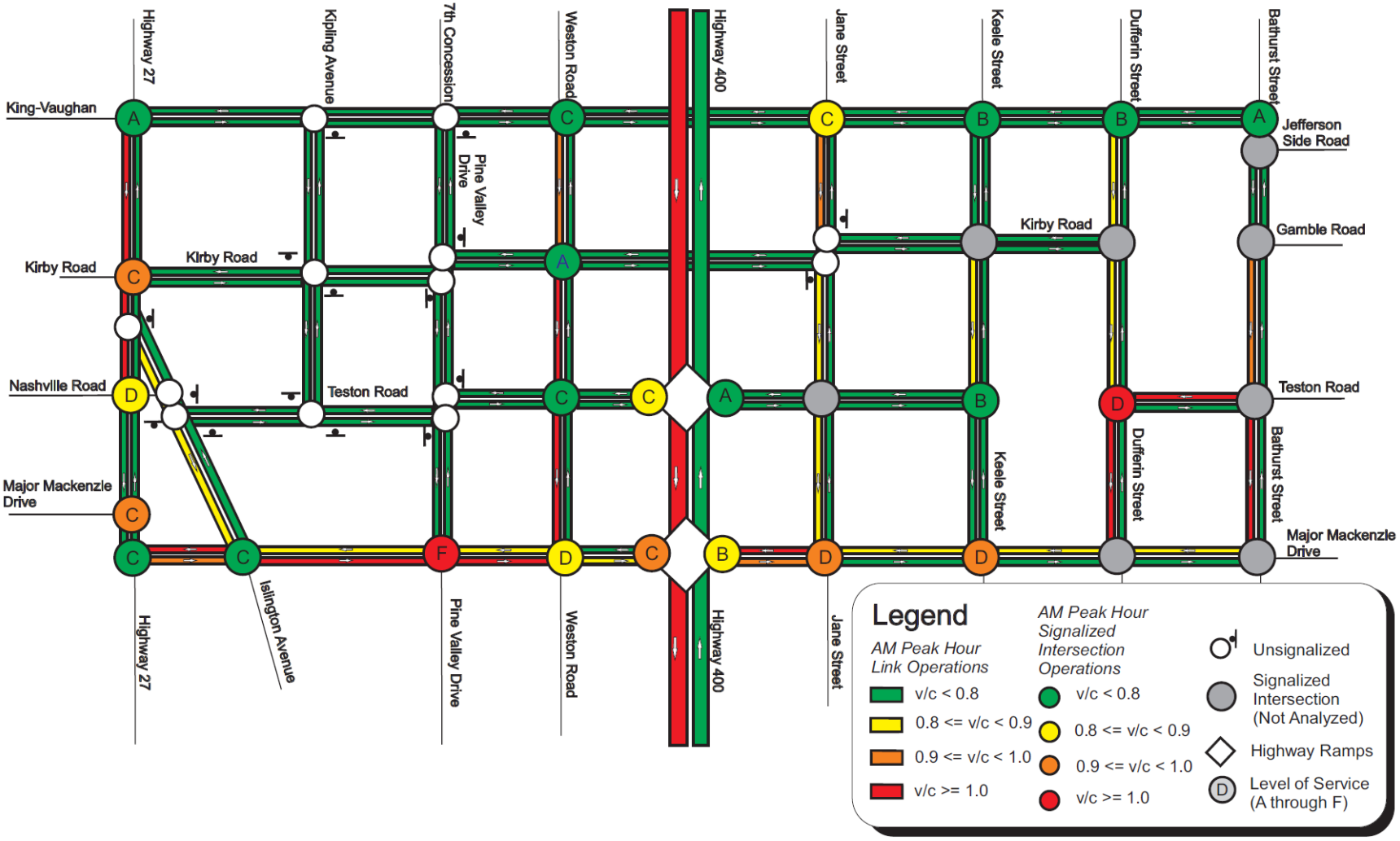


Exhibit 4-15: Existing Link and Intersection Volume to Capacity Ratios

Roadway Level of Service definitions are based on the Highway Capacity Manual and were defined previously in **Table 4-2** in relation to v/c ratio thresholds and operating conditions (amount of delay experienced).

V/C ratio definitions for intersections are similar to those used for links and screenlines as outlined in **Table 4-2**. The Highway Capacity Manual (HCM) further defines Level of Service for signalized and unsignalized intersections as a function of the average vehicle control delay. Existing traffic signal timing and existing traffic turning movement counts are entered into the Synchro software, where LOS may be calculated per movement or per approach for any intersection configuration. However, LOS for the intersection as a whole is only defined for signalized and all-way stop configurations. HCM LOS definitions are summarized in **Table 4-3**.

Table 4-3: 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	Acceptable
C	20-35 sec	15-25 sec	Acceptable
D	35-55 sec	25-35 sec	Somewhat undesirable
E	55-80 sec	35-50 sec	Undesirable
F	≥80 sec	≥50 sec	Unacceptable

It is noted that the analysis may indicate that certain movements at an intersection operate with volume-to-capacity ratios greater than 1.0. Realistically, a maximum volume-to-capacity ratio for existing conditions cannot be greater than 1.0, since the observed traffic volumes cannot be more than the available capacity of the intersection. A volume-to-capacity ratio greater than one (v/c >1) is a result of conservative parameters used in the Synchro analysis for the base conditions at the study area intersections, in addition to the signal timing used, which is only a best-fit representation based on static volumes and timing. The results of the analysis are summarized as follows. In the western part of the study area:

- The southbound direction of Highway 27 through Kleinburg is experiencing congestion in the AM peak hour,
- Highway 27 southbound traffic improves once traffic is able to divert onto Islington Avenue,
- The east-west traffic on Major Mackenzie Drive is congested during the AM peak hour,
- No major capacity issues exist along Kipling Avenue and Pine Valley Drive, and
- Intersections in this area are mostly unsignalized due to little development and thus little traffic.

In the central part of the study area:

- The southbound direction on Weston Road and Highway 400 is very congested with v/c ratios exceeding 1.0,
- The east-west traffic congestion is primarily located on Major Mackenzie Drive, and

- Some east-west congestion is occurring at the Teston Road on-ramp to Highway 400 southbound. This movement is completed by a westbound left-turn at Cityview Boulevard which has a v/c ratio between 0.8 and 0.9 and an intersection level of service of 'C'. Future development of the new communities and employment lands will significantly impact traffic operations at this intersection.

In the eastern part of the study area:

- Bathurst Street serves as a major commuter route for both Vaughan and Richmond Hill traffic,
- Dufferin Street is congested south of Teston Road,
- Major Mackenzie Drive as the only continuous east-west arterial through the study area, and is approaching congestion with a v/c ratio between 0.8 and 0.9, and
- Teston Road between Dufferin and Bathurst is congested with a v/c ratio exceeding 1.0.

4.2.4.1 HIGHWAY 400 INTERSECTION CAPACITY ANALYSIS DETAILS

Intersection capacity and queue length analysis at the Highway 400 ramp terminals was undertaken as traffic issues were identified specifically at these locations. Traffic data was obtained from MTO at each of the ramp terminal intersections with Teston Road and Major Mackenzie Drive. The counts were conducted at all four intersections on May 27, 2015.

Table 4-4 summarizes the intersection capacity analysis and queue lengths at these intersections, while **Exhibit 4-16** and **Exhibit 4-17** illustrate the critical movements. Detailed Synchro reports are provided in **Appendix D** identifying count volumes assessed, trucks, intersection volume to capacity ratio, LOS and queues for each movement.

Table 4-4: Intersection Capacity Analysis for Highway 400 Ramp Terminal Intersections

Intersection	AM Peak Hour	PM Peak Hour
Major Mackenzie Drive / Hwy 400 West Terminal (assumed cycle length of 120s)	EBT has v/c of 1.01 All other movements have v/c of 0.51 or less	WBT has v/c of 0.82 All other movements have v/c of 0.70 or less
Major Mackenzie Drive / Hwy 400 East Terminal (assumed cycle length of 120s)	WBT has v/c of 0.85 All other movements have v/c of 0.78 or less	WBT has v/c of 0.94 NBR has v/c of 0.97 NBL has v/c of 0.94
Teston Road / Hwy 400 West Terminal (assumed cycle length of 90s)	WBL has v/c of 0.90 All other movements have v/c of 0.79 or less. WBL volume is 1,040 according to count, with a 95th percentile queue of 187, storage of 220m.	WBL has v/c of 0.50 All other movements have v/c of 0.22 or less.
Teston Road / Hwy 400 East Terminal (assumed cycle length of 90s)	All movements have v/c of 0.52 or lower.	All movements have v/c of 0.75 or lower.

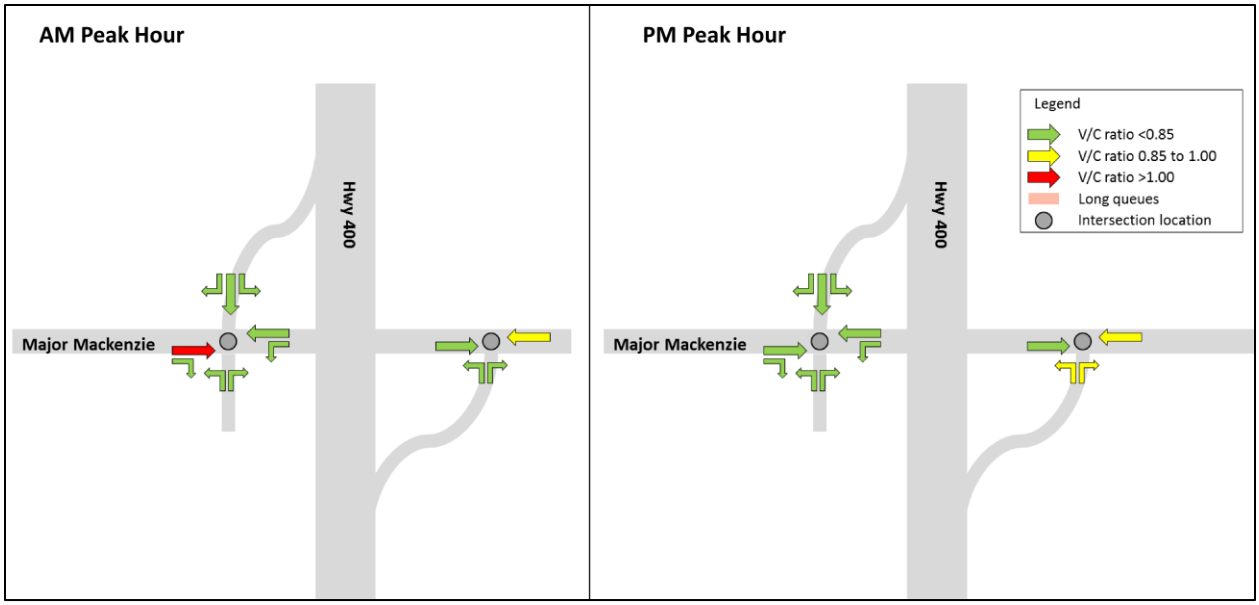


Exhibit 4-16: Intersection Capacity Analysis at Major Mackenzie and Highway 400

Both Major Mackenzie Drive ramp terminal intersections are capacity constrained today due in part to the significant traffic pressures caused by the many missing links in the surrounding east-west arterial roads.

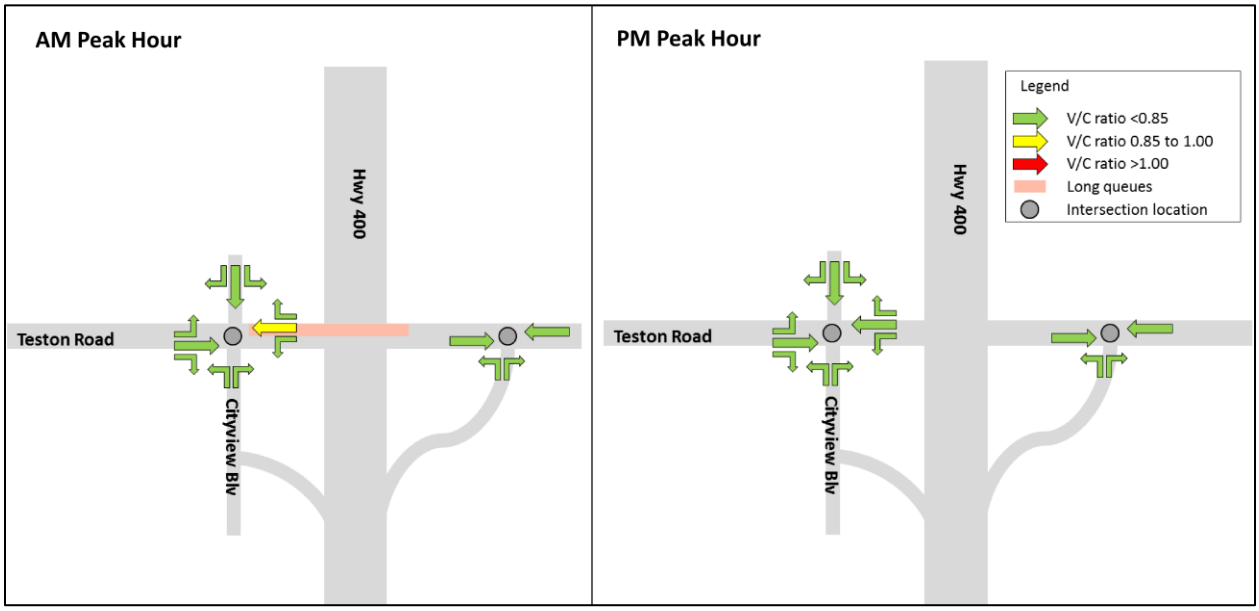


Exhibit 4-17: Intersection Capacity Analysis at Teston Road and Highway 400

At the Cityview Boulevard and Teston Road intersection, which provides access from Teston Road to Highway 400 southbound, there are heavy westbound left-turns particularly in the AM peak hour. This left turn is approaching capacity and has very long queues. The 95th percentile queue length is approximately 187m, relative to available storage of 220m. In the future, the development of the new communities and employment lands will further constrain the

intersection, and improvements to the Highway 400 access at this location may need to be considered.

4.2.5 Local Transit Demand

Local ridership within the study area is relatively low given the existing land use and built form characteristics. In terms of total transit usage, Major Mackenzie Route 4 comprises about one-third of all boardings and alightings. The second-most active route is Route 20 Jane while Route 107 C Keele Route is third. A summary of local transit boardings and alightings within the study area is provided in **Table 4-5**. It is to be noted that ridership data from Routes 107 C Keele and Route 165D and 165F Weston were obtained when it was operated by the TTC prior to the Toronto-York Spadina Subway Extension as mentioned in **Section 4.1.2**

Table 4-5: Local Transit Boardings and Alightings

Route #	Route	AM PEAK TOTAL (within Study Area)		PM PEAK TOTAL (within Study Area)		DAILY TOTAL (within Study Area)	
		Boardings	Alightings	Boardings	Alightings	Boardings	Alightings
4	Major Mackenzie	174	105	169	241	680	682
13	Islington	6	12	7	2	16	27
20	Jane	148	18	44	184	365	425
21	Vellore Local	5	2	3	16	13	24
22	King City	67	60	54	129	238	309
26	Maple Local	93	22	50	142	203	208
107C	Keele (to Teston) (TTC)	115	41	48	154	331	360
165D,F	Weston (to Major Mack / Canada Dr) (TTC)	32	16	13	41	76	115
TOTAL	**NVNCTMP Overall Study Area**	**639**	**277**	**389**	**908**	**1,923**	**2,150**

Source: York Region Transit APC Data Fall 2014 / Winter 2015

As Route 88 Bathurst is on the periphery of the Study Area and the majority of ridership is from the Richmond Hill side, data was not summarized for that route.

4.2.6 GO Rail Demand

The study area is intersected by the Barrie GO Rail corridor and is served by three existing GO stations: King City, Maple, and Rutherford. To support the study, origin-destination (OD) survey data from a 2013 Metrolinx survey was obtained documenting AM peak period work trips and the resulting passenger counts originating from a traffic analysis zone (TAZ) and destined to a given station.

According to the 2013 OD survey, 93 trips originated in the study area in the AM peak period on an average weekday. The majority of existing demand originates in the south-east quadrant of the study area and is destined to Maple GO Station. A smaller number of trips travel further to King City and Rutherford GO stations. These findings are expected as existing development in the Study Area today is limited to estate residential and smaller residential communities. However, the origin-destination patterns and mode of access to these GO stations today could change in the future with increased development within the Study Area.

4.2.6.1 MODE OF ACCESS AND PARKING CAPACITY

At the Rutherford, Maple, and King City GO Stations, the personal auto is the predominant mode of access with approximately 88% at Rutherford GO, 95% at Maple GO, and 97% and King City GO[1]. Further to this finding, a comparison of estimated daily parking demand from the survey compared to actual parking spaces at each station indicates that demand for parking exceeds capacity. **Table 4-6** summarizes the mode of access at each station as well as parking utilization.

Table 4-6: Mode of Access and Parking Utilization and Study Area GO Stations

Mode of Access	Rutherford	Maple	King City
Park and Ride – Alone	997	1,349	525
Park and Ride – Carpool Driver	46	75	22
Park and Ride – Carpool Passenger	15	41	28
Dropped off	224	199	67
Local Transit	62	14	6
GO Bus	0	7	0
Bike	8	0	11
Walk	108	75	6
Total Demand	**1,460**	**1,760**	**665**
Auto Trips	1,282	1,664	642
Transit Trips	62	21	6
Active Trips	116	75	17
Modal Share			
Auto Share	88%	95%	97%
Transit Share	4%	1%	1%
Active Share (overall)	8%	4%	3%
Active Share (< 1 km from station)	17%	11%	27%
Parking Utilization			
Parking Spaces	970	1,319	555
Parking Utilization*	**108%**	**108%**	**99%**

*Measure of parking demand on a typical day versus parking spaces – does not reflect an actual parking inventory survey.
Source: GO Rail Origin-Destination Survey 2013

4.2.6.2 TRIP LENGTH

King City Station is located north of King-Vaughan Road on Keele Street and attracts approximately 665 work trips per day in the AM peak period. As shown in **Exhibit 4-18**, 27% of trips originate within 5 km from the station, 51% are between 5 and 10 km, and 22% come from more than 10 km away. For trips within walking distance of the station (i.e. less than 1 km) approximately 27% are by walking and cycling.

[1] 2013 GO Rail Origin-Destination Survey

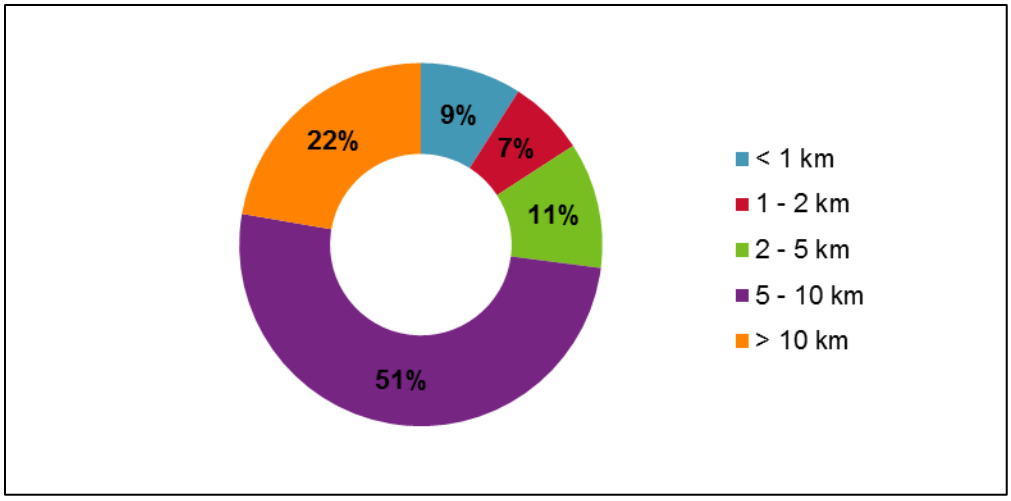


Exhibit 4-18: Share of Passenger Trip Origins by Distance from Station (King City)
Source: GO Rail Origin-Destination Survey 2013

Maple Station is located north of Major Mackenzie Drive and east of Keele Street and attracts approximately 1,759 work trips per day in the AM peak period. As shown in **Exhibit 4-19**, 75% of trips originate within 5 km from the station, 23% are between 5 and 10 km, and 2% come from more than 10 km away. For trips within walking distance of the station (i.e. less than 1 km) approximately 11% are by walking and cycling.

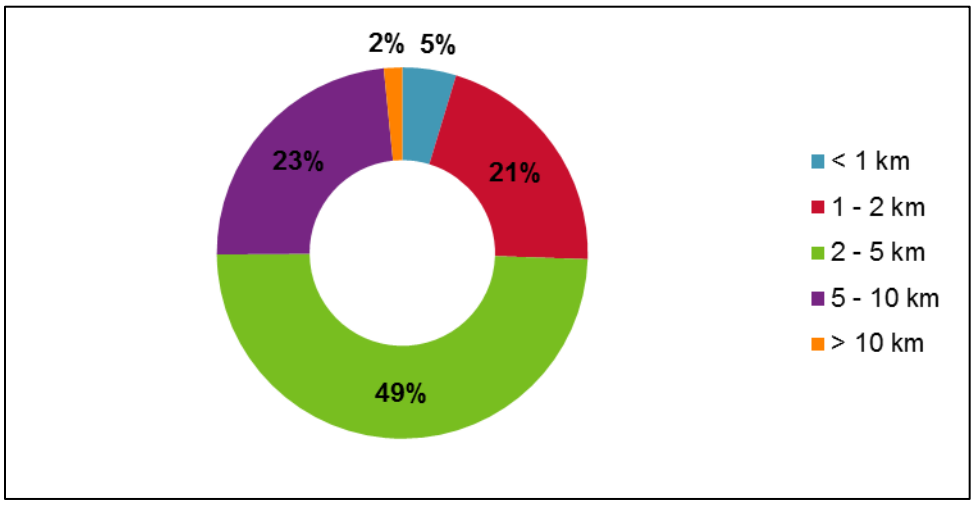


Exhibit 4-19: Share of Passenger Trip Origins by Distance from Station (Maple)
Source: GO Rail Origin-Destination Survey 2013

Rutherford Station is located on Rutherford Road east of Keele Street and attracts approximately 1,460 work trips per day in the AM peak period. As shown in **Exhibit 4-20**, 77% of trips originate within 5 km from the station, 23% are between 5 and 10 km, and no trips come from more than 10 km. For trips within walking distance of the station (i.e. less than 1 km) approximately 17% are by walking and cycling.

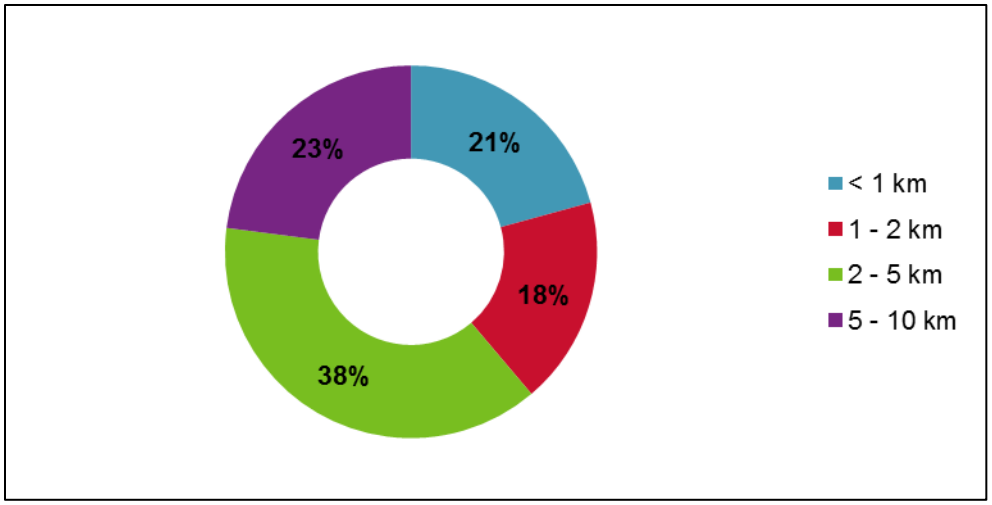


Exhibit 4-20: Share of Passenger Counts by Distance from Station (Rutherford)
Source: GO Rail Origin-Destination Survey 2013

Exhibit 4-18 through **Exhibit 4-20** illustrate the evolution of travel patterns to GO Stations as the surrounding area becomes more developed over time. The density and land use around stations impact the types of trips to the station. A more rural environment like King City attracts trips from greater distances while more developed areas like the neighbourhoods surrounding Rutherford GO Station attract fewer long distance trips and many short trips which can be made by walking and cycling. This shows the importance of density around GO stations and how this influences types and travel mode. The planning for the Kirby GO station will consider opportunities to provide density and connectivity to promote multimodal access.

4.2.7 Commercial Vehicles

Regional Roads and Provincial Highways within the study area are currently used as truck routes within the City of Vaughan. In the future truck traffic will increase due to planned growth in employment and industrial lands to the east and west of the study area. Existing and future truck traffic routes and generators are depicted in **Exhibit 4-21**. Commercial Vehicle volumes presented represent annual average daily truck traffic (AADTT) in 2006 for major truck routes within the vicinity of the overall study area as follows:

- Highway 27 (Regional Road)
- Highway 400 (Provincial Highway)
- Keele Street (Regional Road)
- Teston Road (Regional Road)

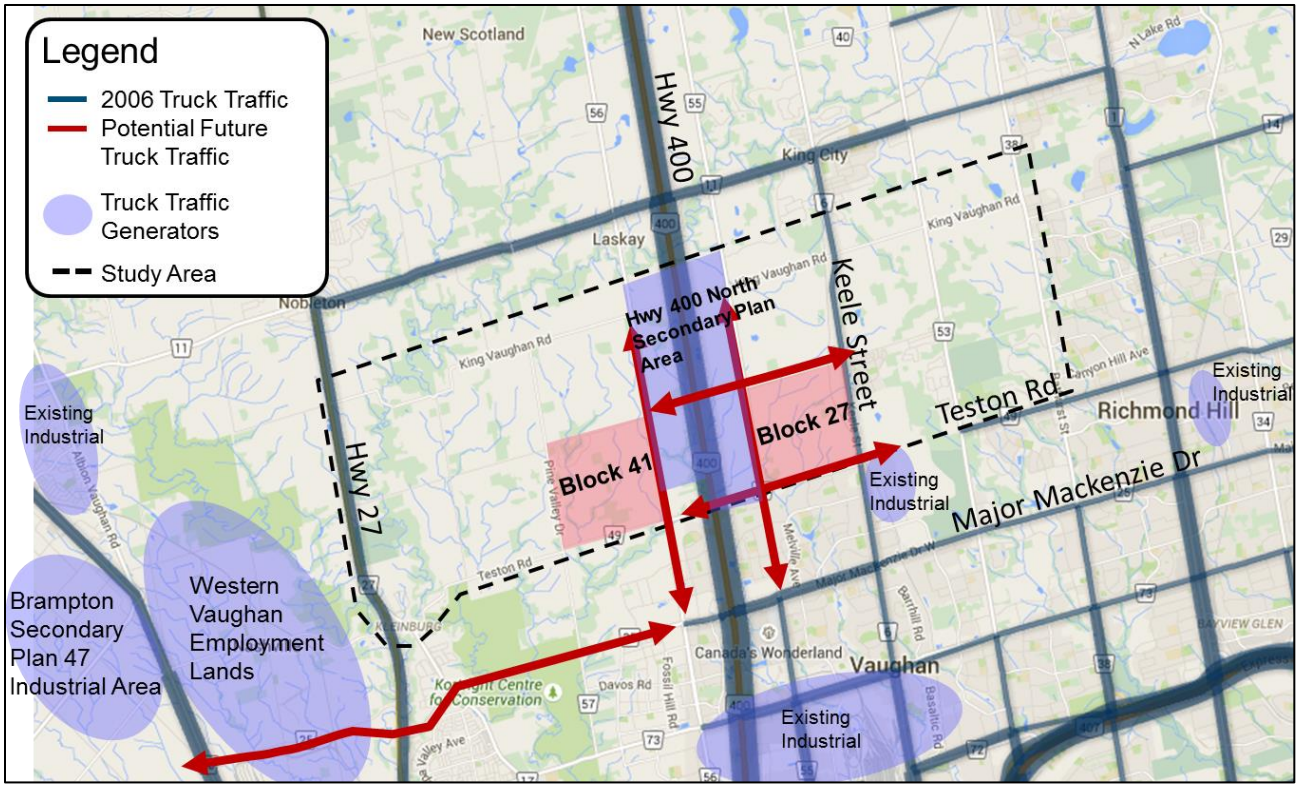


Exhibit 4-21: Existing Commercial Vehicle Volumes and Potential Future Truck Demand
Source: MTO 2006 AADT iCorridor mapping and 2011 Cordon Count Program

Within the study area, the following York Region roads are subject to year-round weight restrictions heavier than five tonnes per axle and in need of an Excess Load Permit to use these roads:

- Pine Valley Drive: between Rutherford Road and Teston Road, and
- Teston Road: between Pine Valley Drive and Weston Road.

4.2.8 Active Transportation

The existing active transportation network within the primary study area consists of sidewalks within existing residential neighbourhoods and paved shoulders along Regional Roads. The existing cycling facilities in the study area and the surrounding context are mapped in **Exhibit 4-22**.

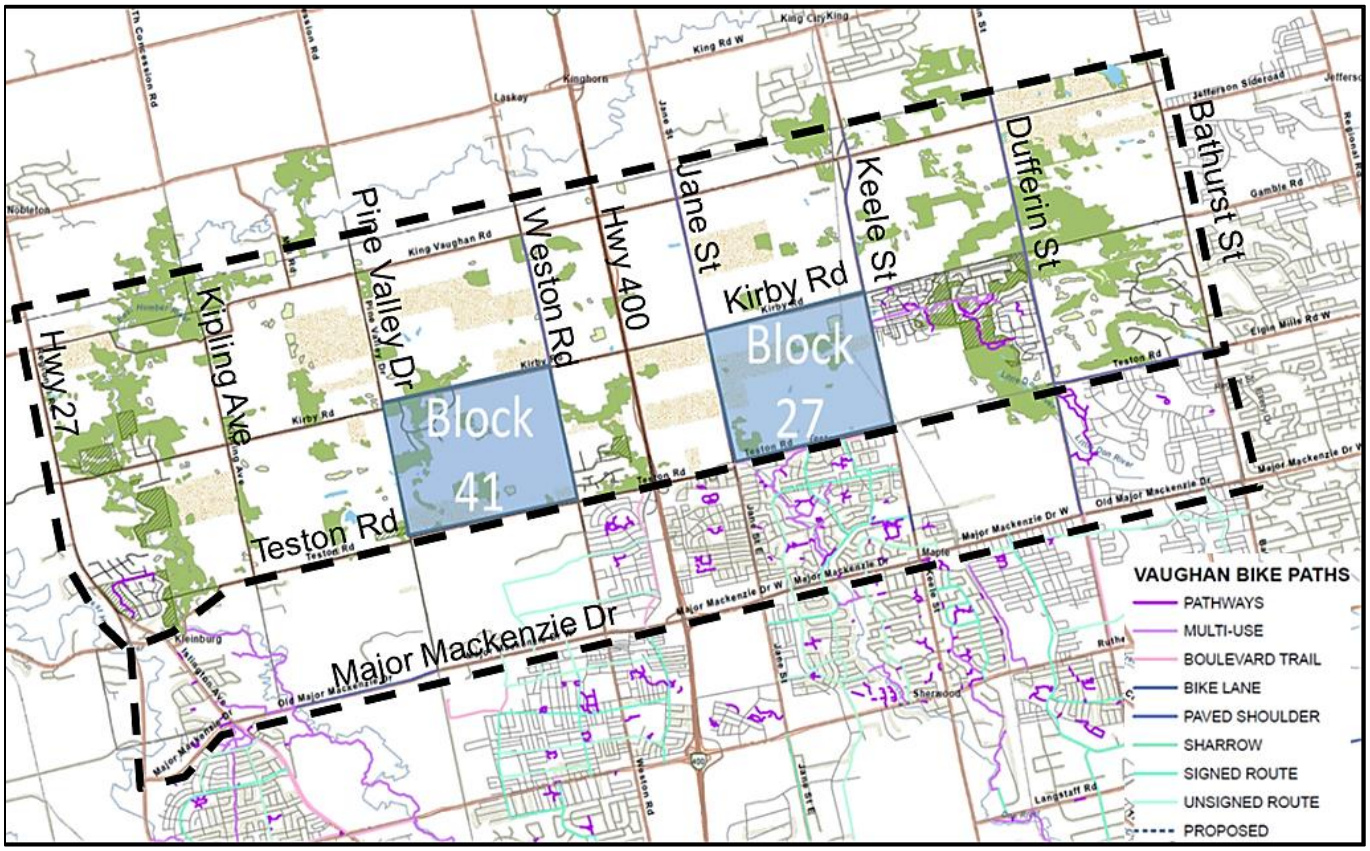


Exhibit 4-22: Existing Cycling Infrastructure
Source: City of Vaughan GIS Database, July 2015

The Strava global heat map provides an indication where people are currently cycling. Strava is a mobile application used predominantly by recreational cyclists which tracks their route, speed, and distance. The company makes aggregate data available as a heat map, indicating which streets are most often used for cycling. The colors in **Exhibit 4-23** indicate the level of cycling activity, with green being lower and red being higher. It should be noted that Strava data tends to represent a skewed user base (generally recreational cyclists who are predominantly male). The higher activity levels in North Vaughan follow the Village Roundabout, a 59 km section of the Greenbelt Loop, a regional cycling route that follows Kipling Avenue and King-Vaughan Road between Kipling Avenue and Weston Road.

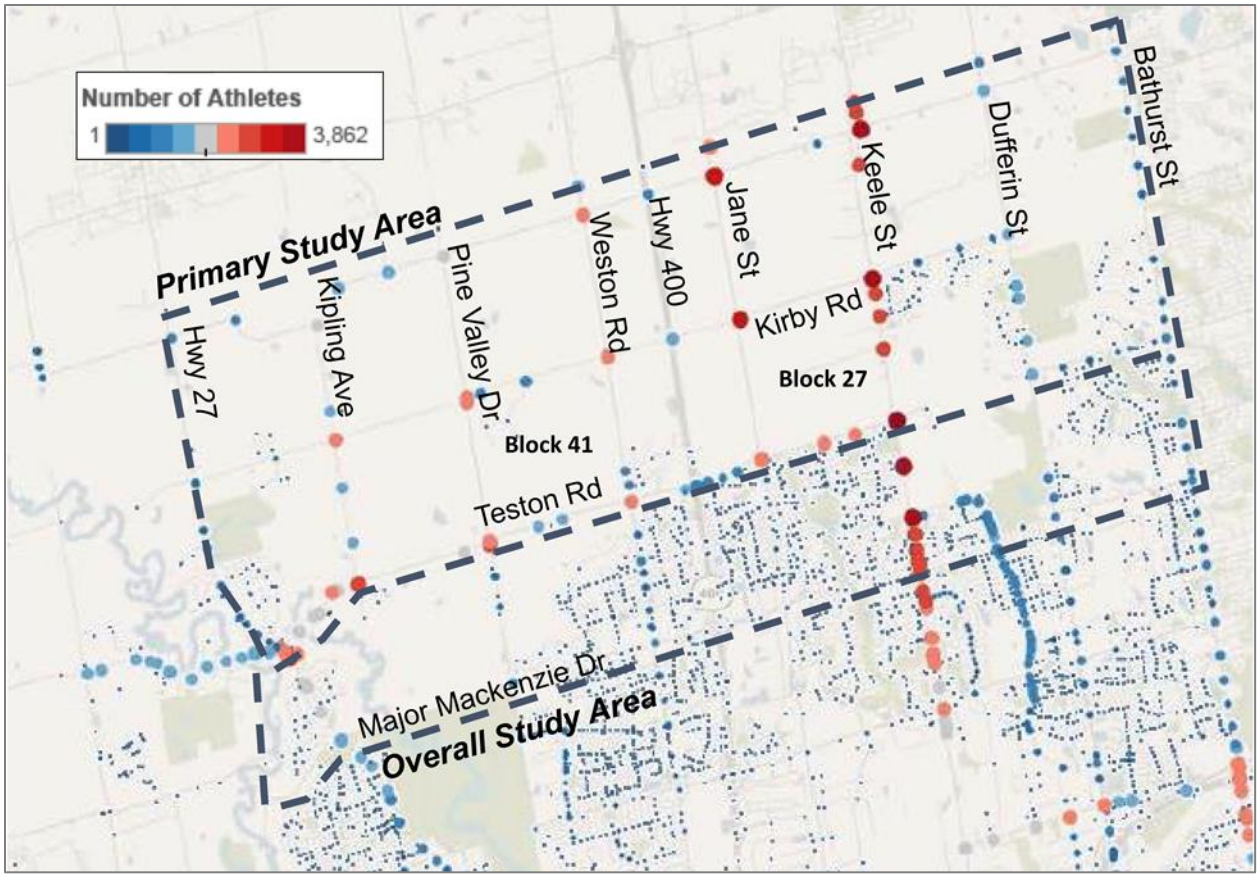


Exhibit 4-23: Strava cycling heat map including Block 41 and Block 27
Source: Strava Cycling Data, January 2017

The Strava data suggest several routes are currently being used by cyclists in the North Vaughan area. From the heat map, the following roads are generally used more than others:

- Keele Street through the Study Area and to the south of the Study Area
- Teston Road from Kleinburg to Keele Street
- Jane Street through the Primary Study Area
- Kirby Road between Kipling Avenue to Dufferin Street

This information will inform recommendations later on in this report.

4.3 Natural Environment

The assessment of the natural environment supporting the NVNCTMP study is conducted at a high level to inform transportation infrastructure needs across the study area firstly, but a second further level of detail is provided later on in this report to support the network development in the Highway 400 north employment lands secondary plan and New Community areas of Block 27 and 41.

The Greenbelt Plan (2017) protects the ecological, agricultural, and hydrological land use. The Greenbelt Plan identifies areas where urbanization should not occur. Lands identified in the

Niagara Escarpment Plan (NEP) and the Oak Ridges Moraine Conservation Plan (ORMCP) are also included in the Greenbelt Plan.

The VOP 2010 includes a Natural Heritage Network (NHN) that represents an interconnected system of natural features and functions to protect natural heritage features and ecological functions in a healthy and resilient system ensuring long term protection and management of Vaughan's natural heritage system. The NHN is composed of Core Features, Enhancement Areas and Built-up Valley Lands. The City's Core Features includes but is not limited to watercourses, hazard lands, fish habitats, wetlands, significant woodlands, and significant wildlife habitat (see Exhibit 4-25).

Policies under Section 3.2 Vaughan's NHN of the VOP 2010, speak to the protection of these features and their ecological function. Section 3.3 Features of the NHN contain policies applicable to specific features such as valley and stream corridors, wetlands, woodlands, species at risk and significant wildlife habitat, fisheries and aquatic habitat etc. Section 3.6.2 also provide policies protecting our groundwater, hazardous lands and sites i.e., flooding hazards, special policy area, stormwater management.

In 2014, City's Natural Heritage Network Study (2014) delivered a refined NHN and updated Schedule 2 of the VOP 2010 NHN, shown in **Exhibit 4-24** including lands in the Greenbelt Plan Area and Oak Ridges Moraine Conservation Plan (ORMCP) Area. Study Area west of Highway 400 generally has more prominent coverage of the Greenbelt Natural Heritage System; whereas, east of Highway 400 has more prominent coverage of Natural Linkage Areas under the ORMCP boundary including an area subject to ORMCP Minister's Zoning Order southeast of Dufferin Street and Kirby Road.

The NVNCTMP study Area extends into Block 34, 27 and 41 study areas containing two major watersheds – the East Humber River and the Don River.

Block 34

Block 34 as part of the Highway 400 North Employment Lands are designated as future employment and are situated along Highway 400, encompassing the lands between Weston Road and Jane Street, and between Teston Road and Kirby Road. The existing residential lands including the Rimwood community within Block 34 is excluded from the Secondary Plan area. As per the Highway 400 North Employment Lands Secondary Plan, the limits of the Natural Heritage Network is to be confirmed through Block Plan. All attempts to avoid, mitigate, and compensate impact the NHN is to occur.

Block 27The Natural Heritage Assessment/ Ecology component of the West Don River Subwatershed Study, which was undertaken by Cole Engineering and Beacon Environmental on behalf of the Block 27 Participating Landowners Group (completed June 2017), addresses refinements to the City's NHN, as well as the Phase 2-4 Natural Heritage Network Study (2014). The Natural Heritage Network Study identifies a preliminary NHN for Block 27 and has been further reviewed by North South Environmental Inc. (NRSI), the City's environmental consultant. In addition, the Ministry of Natural Resource and Forestry (MNRF) has carried out a wetland

evaluation in August 2017, which determined that there are several Provincially Significant Wetlands (PSWs) located centrally within Block 27.

Block 41

In 2014, the Block 41 Participating Landowners Group's initiated the East Purpleville Creek Subwatershed Study (Study) as part of the Block 41 Secondary Plan process. The Participating Landowners Group's submitted the first draft of the Study in March 2018. The Study identifies a preliminary NHN, preliminary stormwater management concept and restoration plans. It also includes hydrology and erosion assessment for the larger East Purpleville subwatershed and recommends stormwater management criteria for all future developing areas in this subwatershed.

The MNRF identified Species at Risk, specifically Redside Dace in the East Humber River, Purpleville Creek, and Don River East Branch. Within Block 41 study area, MNRF also identified PSW's within the Block.

The City's preliminary NHN's for Highway 400 North Employment Lands including Block 34, and the New Community Blocks 27 and 41 will be further refined through the subsequent Block Plan process. Additional natural heritage evaluations will be undertaken through project specific environmental assessments.

4.4 Utility Corridors

The Study Area is crossed by two major utility corridors – the east-west TransCanada Pipeline (TCPL) corridor just south of Kirby Road and a major hydro corridor traversing north-south west of Kipling Avenue, as illustrated in **Exhibit 4-26**. A TCPL compressor station is located within Block 41, and from this station a north-south spur line extends northward into King Township.

The TransCanada Pipeline corridor also acts as a physical barrier to development but provides an opportunity to incorporate green space, walkways, bicycle or multiuse paths to enhance active transportation and recreation. A map of these utility corridors is provided in **Exhibit 4-26**.

The existing natural environmental features and utilities which pose constraints can also be leveraged to provide structuring elements for the design of the new communities and its transportation network. For example, the Greenbelt limits the developable area and results in a discontinuous road network; however, it also provides an opportunity to explore how trails through natural areas can be used to connect communities. Details of these opportunities are discussed later in the report under **Section 8.4**.

4.5 Archaeology and Cultural Heritage Resources

4.5.1 Archaeology

Archaeological sites are distributed within the Study Area, reflecting a variety of past human activities or events that are of cultural heritage value or interest. Many archaeological sites are remnants of indigenous activities and provide insights into Vaughan's very early past. The city of Vaughan supports the identification and protection of significant archaeological resources as an

important part of Vaughan's past. The project team has consulted and met with indigenous communities and expressed respect for their cultural heritage. The project team has continued to work closely with these groups throughout the study process.

The Archaeological Management Plan completed by York Region in 2014, with comprehensive data provided by the City, concluded that only 3.2% of the archaeologically relevant designated properties are not captured by the Region's analysis and documentation. For more details on the history of the archaeological settlements in Vaughan, please refer to York Region's Archaeological Management Plan and Figure 13 of the Plan shows the Archaeological Potential in the City of Vaughan Urban Expansion Area, which is within the NVNCTMP Study Area. All proposed development as part of this Plan within areas of high archaeological potential will require an Archaeological Assessment as per the Ministry of Tourism, Culture and Sport Standards and Guidelines for Consulting Archaeologists.

No development or grading shall occur on any site within the study area that is identified as being of high archaeological potential or significance as a result of the archaeological evaluation carried out on the property, until protective and mitigative measures of all significant archaeological sites have been fulfilled to the satisfaction of the Ministry of Tourism, Culture and Sport (Archaeology Unit) and the City of Vaughan.

Through consultation with various indigenous communities, additional information was gathered through this study which recognizes the cultural significance of these lands to the indigenous peoples. This included email correspondence and in-person meetings, which are documented in **Appendix C**. Future development must consider the sensitivity of these lands and consultation with the groups identified through this study should be carried out before any development can occur.

4.5.2 Cultural Heritage Landscapes

There are a number of existing cemeteries in the Study Area, including an existing cemetery in Block 27 on west side of Keele Street that should be avoided. Any existing or potential Cultural Heritage Landscapes within the Study Area will require the completion of a Cultural Heritage Impact Assessment, including mitigation options, should any of the proposed works as a result of this Plan should affect these identified features.

4.5.3 Built Heritage

The northern portion of the Kleinburg-Nashville Heritage Conservation District Plan area is located within the Study Area, designated under Part V of the *Ontario Heritage Act*, R.S.O. 1990, c. O.18. Any proposed works as part of this Plan will require Cultural Heritage review and applications, as per Section 42 of the *Ontario Heritage Act*.

There are existing properties located in the Study Area that are designated under Part IV of the *Ontario Heritage Act*. Any proposed works as part of this Plan will require Cultural Heritage review and applications, as per Section 33 of the *Ontario Heritage Act*.

There are existing properties that are included in the Listing of Buildings of Architectural and Historical Value, the City of Vaughan's Register of Property of Cultural Heritage Value as per

Part IV, Subsection 27 of the *Ontario Heritage Act*. Any proposed demolitions of these buildings requires that the owner gives City of Vaughan Council at least 60 days of notice in writing of the owner's intention to demolish or remove the building or structure.

There are existing properties that are recognized as Cultural Heritage Character Areas and Properties of Interest, which will require the completion of a Cultural Heritage Impact Assessment, including mitigation options, should any of the proposed works as a result of this Plan should affect these identified features.

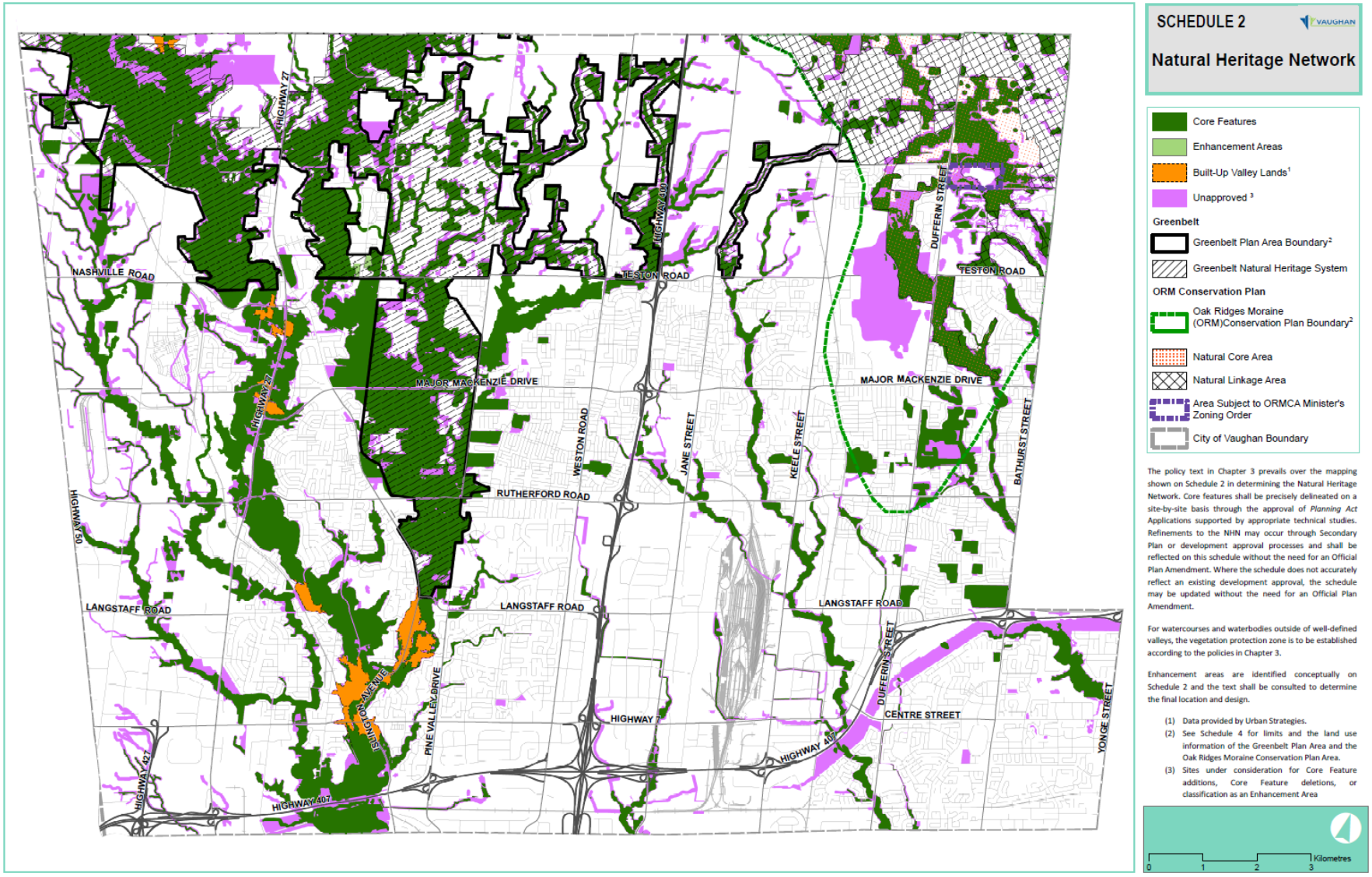


Exhibit 4-24: Natural Heritage Network
Source: Schedule 2, Vaughan Official Plan 2010, schedule updated April 2018

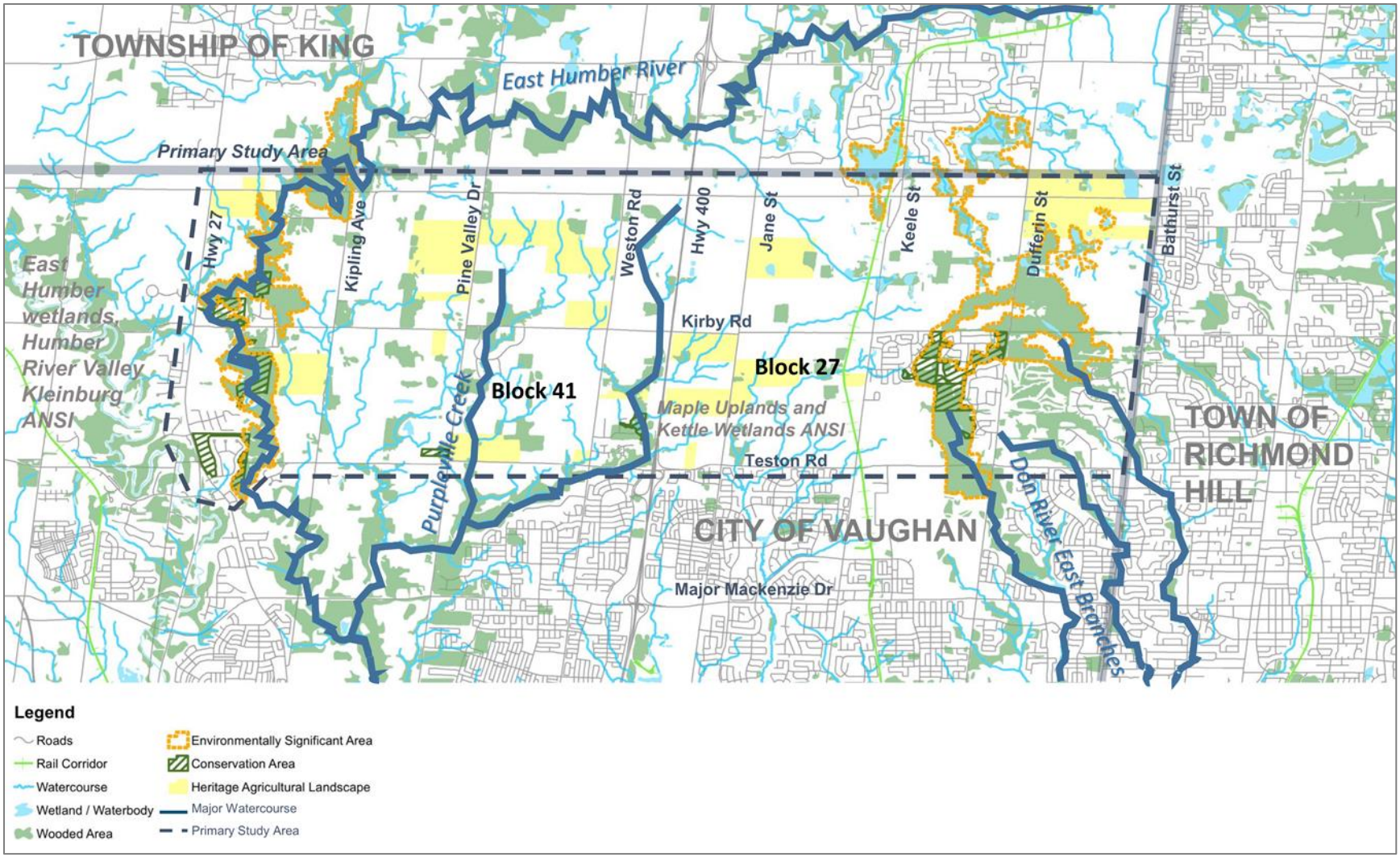


Exhibit 4-25: Natural Features and Watercourses
Source: York Region Geomatics, City of Vaughan, GIS Database, July 2015

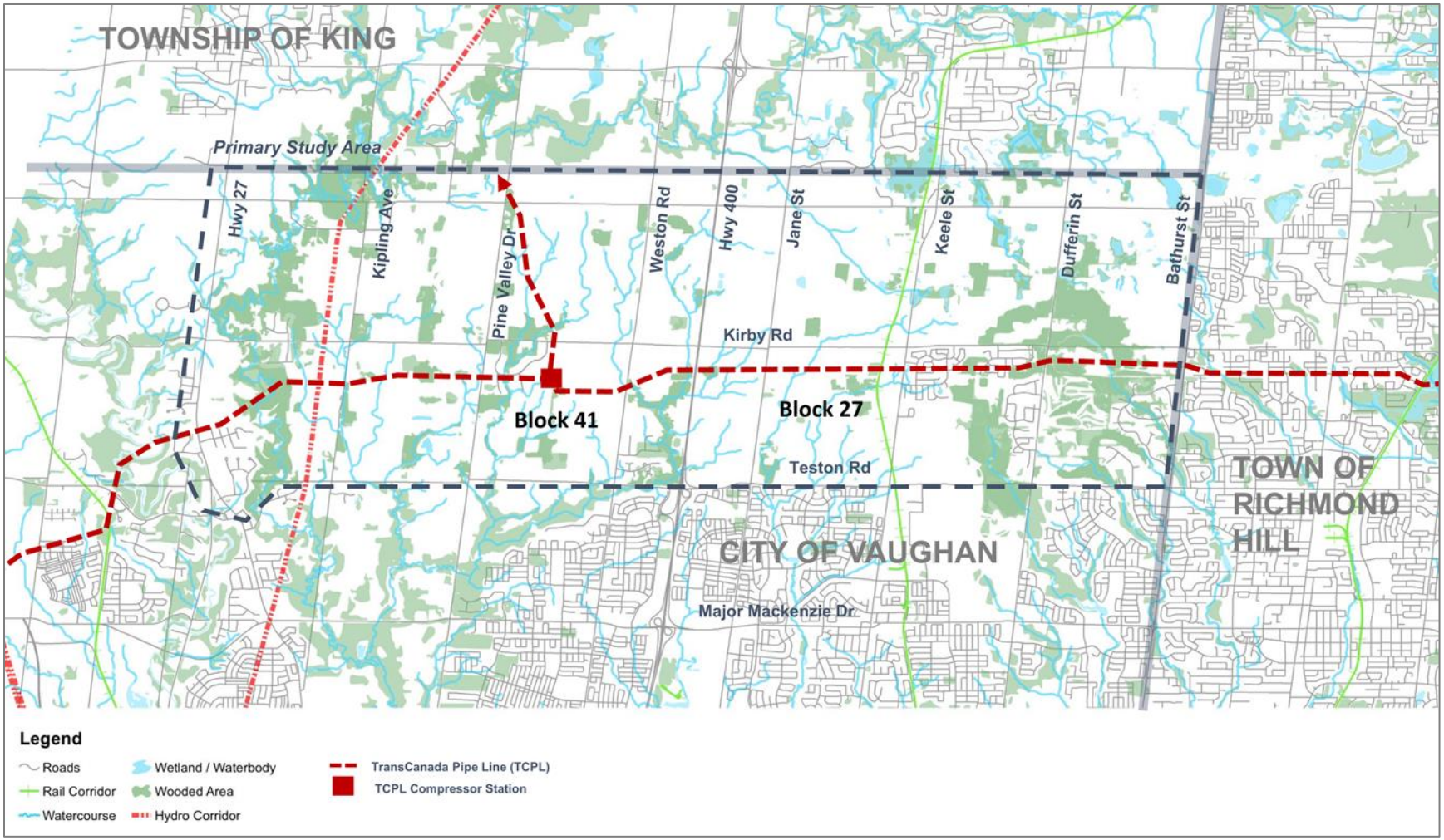


Exhibit 4-26: Utility Corridors
Source: York Region Geomatics, City of Vaughan, GIS Database, July 2015

5 Future Conditions

The development of the new communities in Blocks 27 and 41 plus other growth in the study area will result in increased travel demands. Future travel conditions accounting for this growth is identified in the following sections.

5.1 Future Growth

Between 2011 and 2031, the study area is expected to grow significantly. As documented in Section 2, the City of Vaughan has identified a number of growth areas and other development within or surrounding the study area. These include:

- New Communities in Blocks 27 and 41
- Highway 400 North Employment Secondary Plan Area (Blocks 34 and 35)
- Blocks 40 and 47
- Block 55
- Future proposed Regional Park, east of Block 27
- Future Kirby GO Station in Block 27
- Vaughan Healthcare Precinct Growth Area
- Vaughan Mills Secondary Plan Area

5.1.1 Population and Employment Forecasts

In May 2017, the Ministry of Municipal Affairs released an amendment to the Growth Plan for the GGH which identified a new 60% target for intensification. As forecasts for this 60% land use intensification will take time to develop, York Region identified an interim 45% land use intensification scenario. The 45% scenario was used for the NVNCTMP.

Population and employment forecasts for the horizon year of 2031 are presented in **Table 5-1**. **Exhibit 5-1** illustrates the total Study Area growth and **Exhibit 5-2** illustrates the location of the Blocks and growth in each Block. It is noted that Blocks 28 and 42 were included in the tables and exhibits as they are potential future development areas beyond 2031.

Table 5-1: Population and Employment Forecasts for 2021, 2026, and 2031

Area	2011 Population	2031 Population	2011 Employment	2031 Employment
Block 27	110	26,360	30	2,150
Block 41	280	12,120	50	1,000
Block 34	290	950	160	7,820
Block 35	140	90	330	5,030
Block 42	90	90	-	-
Block 28	50	50	190	190
Block 55 Kleinburg East	1,360	6,930	390	750
Rest of NVNCTMP Study Area	6,390	8,310	760	830
Total NVNCTMP Study Area	**8,710**	**54,900**	**1,910**	**17,770**
City of Vaughan	**272,550**	**430,272**		

Source: York Region 45% Intensification Scenario, November 2015 / City of Vaughan Draft Block 27 Secondary Plan, December 2016 / City of Vaughan Draft Block 41 Secondary Plan, October 2015

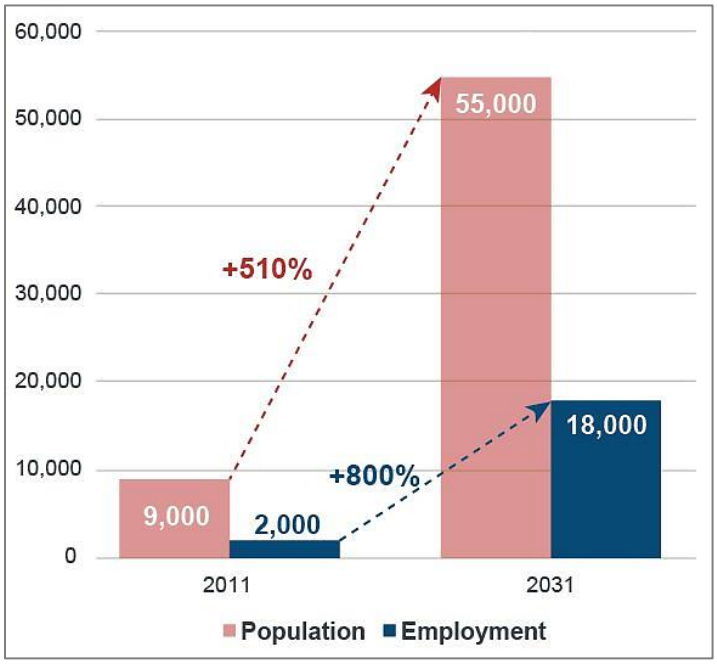


Exhibit 5-1: Primary Study Area Population and Employment Growth (2011 – 2031)

Significant growth is anticipated within the study area by 2031, changing from about 10,000 people in primarily estate homes and rural land uses to about 55,000 persons and 18,000 jobs

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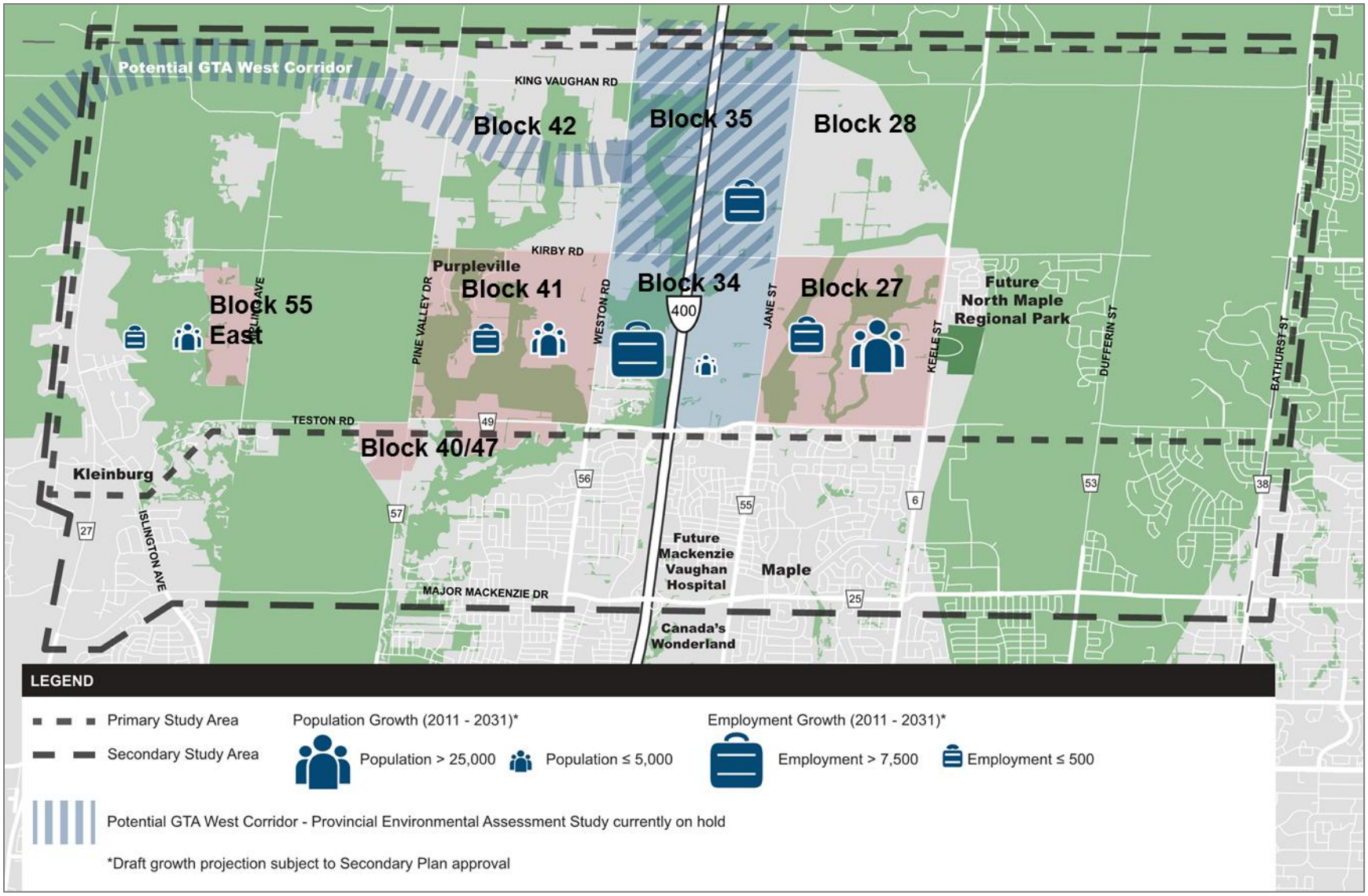

Exhibit 5-2: Primary Study Area Population and Employment Growth (2011 – 2031)

5.2 Block 27 Secondary Plan (pending York Region approval)

The Block 27 Secondary Plan completed in March 2018, approved by City Council in June 2018, provides detailed policies on land use, natural heritage, urban design, transportation, and other topics for the development of the Block.

NVNCTMP identifies the transportation requirements for Block 27 ensuring the transportation network for the block is integrated and connected to the surrounding North Vaughan area. The NVNCTMP also establishes the needs and justification for proposed collector roads in Block 27 in compliance with Phase 1 and 2 of the Class EA. The recommended road network for Block 27, which is presented in Schedule D of the Block 27 Secondary Plan, provides the basis for further detailed studies for the collector road system in accordance with Phases 3 and 4 of the Class EA

Block 27 is bounded by Kirby Road to the north, Keele Street to the east, Teston Road to the south and Jane Street to the west. It has an area of approximately 400 hectares (990 acres) made up almost entirely of rural land uses such as greenbelt, natural areas and agricultural uses. The TransCanada Pipeline runs across the northern part of the Block and the GO Train railway runs adjacent to Keele Street in the eastern section of the Block.

Block 27 is envisioned as a complete community that prioritizes people, sustainability, and liveability with a high quality of urban design. It will have a mix of low and mid-rise buildings with a blend of residential, commercial and institutional uses. Block 27 will be anchored by a local centre that has schools, community facilities, and a transit hub with future Kirby GO station. The Block 27 land use and transportation plan include:

- A transit hub located in the northeast quadrant of Block 27 which is being planned concurrently with the Block 27 Secondary Plan and this NVNCTMP as the Kirby GO Transit Hub Sub-study.
- The transit hub area will be supported by mid-rise mixed use and residential land uses
- The rest of Block 27 will contain low-rise residential and low-rise mixed-use land uses.
- A collector road network that will maximize mobility choices.
- A recreational trail system connecting to the proposed TransCanada Pipeline Trail.
- Jog elimination at Jane Street and Kirby Road.
- Grade separations at intersections with the GO Barrie Corridor.

5.2.1 Draft Land Use Plan

Block 27 is planned to accommodate a population of 14,420 – 26,360 people in 4,900 – 8,900 housing units and a related 1,180 – 2,150 jobs are planned. Of this total, a population of 4,220 – 7,420, together with 820 – 1,510 jobs, are planned to be located in the Kirby GO Transit Hub.

Detailed land use information was provided for Block 27 and is shown in **Table 5-2** which illustrates that the maximum of each range was used for the analysis to provide a conservative estimate of its impact on the transportation network. The majority of the Block will be developed for residential land use, with mixed land use located adjacent to the major arterials. Employment sources in the Block are from mixed land uses and education.

Within the local centre located in the northeast quadrant of Block 27, the land uses include:

- The proposed transit hub (with the future Kirby GO Station)
- Mid-rise mixed use (close to the transit hub)
- Mid-rise residential

Table 5-2: Block 27 Population and Employment

Quadrant	2031 Population	2031 Employment
North	2,970	600
South	15,150	510
East	4,450	910
West	3,790	130
Total	**26,360**	**2,150**

Source: Draft Block 27 Secondary Plan, City of Vaughan, December 2016*
*NOTE: Assumed growth totals for the purposes of transportation analysis and modelling to inform the NVNCTMP study. Subject to change as the Block 27 Secondary Plan is finalized.

The land use plan for Block 27 is provided in **Exhibit 5-3**, adopted by Vaughan Council in June 2018 and pending York Region's approval, with quadrant allocations for the purposes of transportation analysis and modelling.

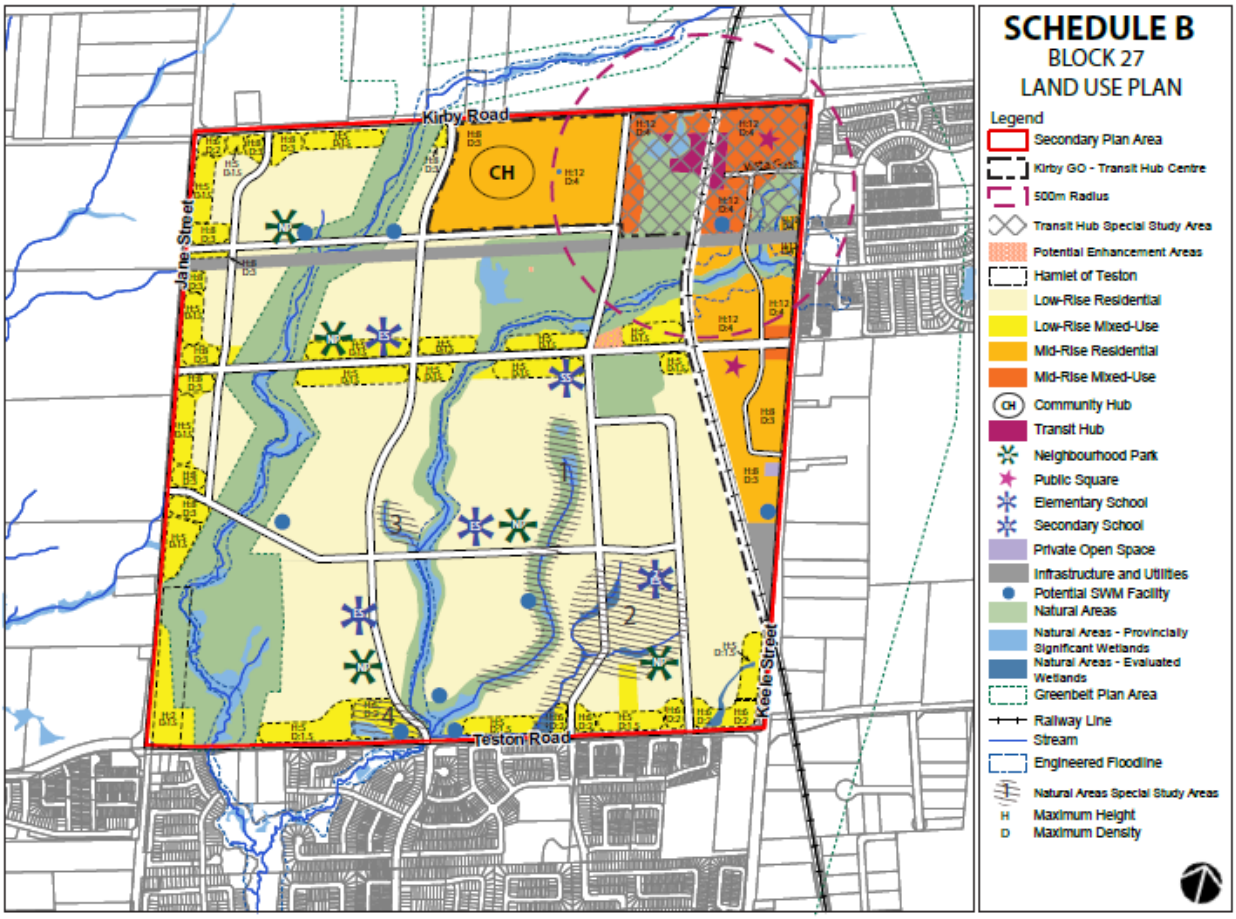

Exhibit 5-3: Block 27 Secondary Plan Schedule B: Land Use Plan
Source: Block 27 Secondary Plan, OPA 33 adopted by Vaughan Council June 2018.

5.2.2 Transportation Network Development

As noted previously the NVNCTMP study supported the Block 27 secondary plan through the identification and justification for the preferred transportation network. The process for the network development included consideration of alternative network solutions, evaluation of those alternatives to select a preferred alternative, and detailing of the preferred alternative.

The evolution of the preferred network for Block 27 followed an integrated approach in consultation with the Block 27 Secondary Plan team, participating landowners and their representatives, and the NVNCTMP study team. Through this process, three distinct networks were identified, and which were evaluated to identify a preferred network:

1. The first network alternative is a preliminary transportation network developed with background information provided by the Block 27 Participating Landowners group. This network was identified prior to the start of the Block 27 process and modified following further study and consultation with the City.
2. The second alternative was developed after April 2015 through a workshop with stakeholders' input.
3. The third alternative was developed in consideration of the 2016 YR-TMP update and an initial feasibility assessment in December 2015.

A preliminary evaluation considering the following categories was conducted on these three network alternatives:

- Transportation
- Natural Environment
- Socio-Economic Environment
- Cost and Implementation

The evaluation ultimately identified ***the Refined Block 27 Network, Alternative 3, as the preferred collector network for Block 27.***

Details on the evaluation and alternatives are documented in **Appendix A**, while the final transportation network for Block 27 is illustrated in **Exhibit 5-4**.

It should be noted that the evaluation presented is preliminary, further and more comprehensive review of the constraints in the area is required prior to construction and should include identification of all natural heritage features, natural (erosion and flood) hazards, and hydrogeological site conditions.

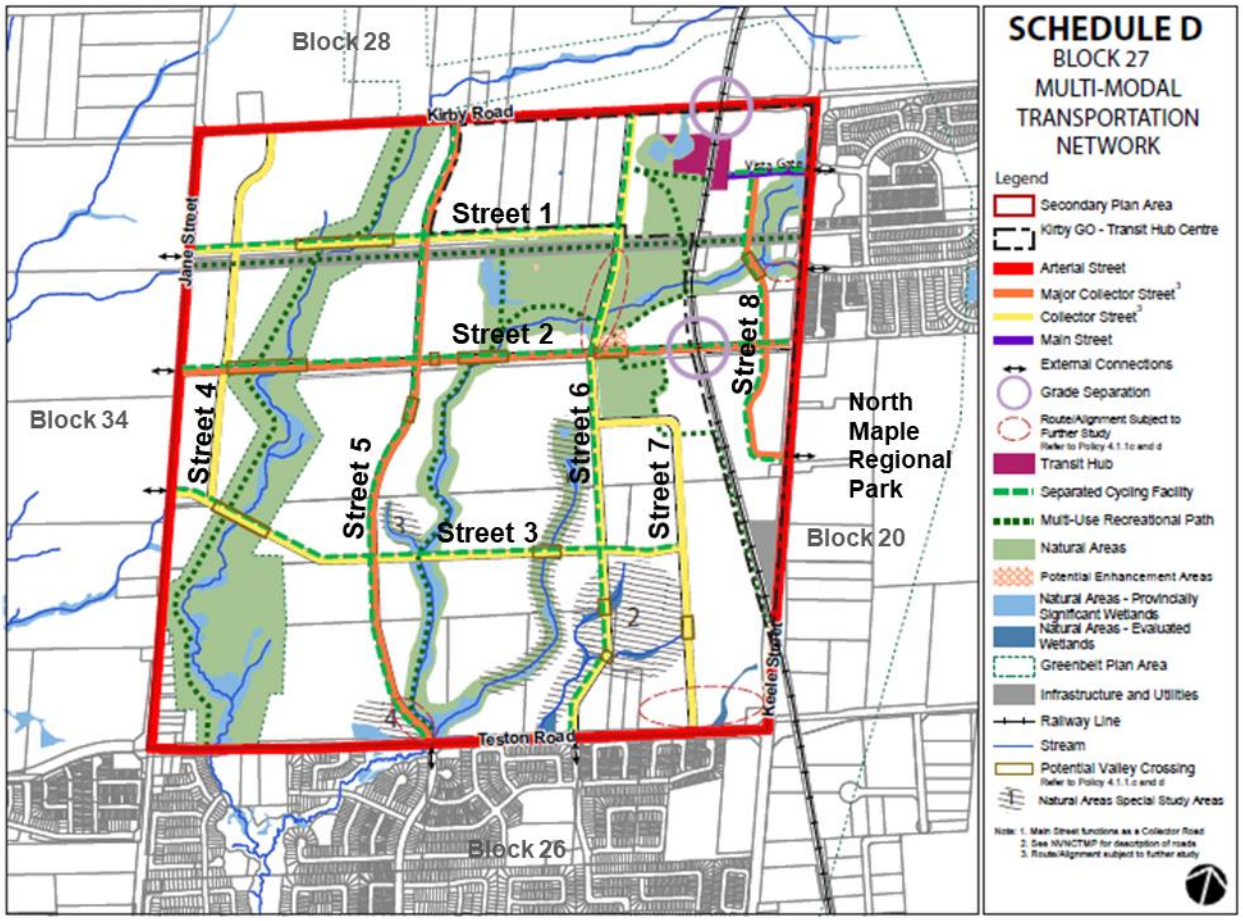

Exhibit 5-4: Block 27 Secondary Plan Schedule D: Multi-Modal Transportation Network
Source: Block 27 Secondary Plan, OPA 33 adopted by Vaughan Council June 2018

Key recommendations were made to minimize environmental and natural heritage impacts and to maximize transportation service and connectivity for the Block. Recommendations include:

- Realignment of Streets 1 and 2 to avoid the woodland in the east,
- Grade separation of Street 2 at the Barrie GO Rail line
- Street 2 potential connection to North Maple Regional Park lands
- Realignment of Street 3 to connect further north at Jane Street to avoid the crossings of watercourses,
- Realignment of the Street 5 connection to the existing signalized intersection at Cranston Park Avenue south of Teston Road into an existing neighborhood with transit service running along this collector road, and
- Realignment of the Street 6 connection between Streets 1 and 2 to avoid a woodland and significant wildlife habitat,
- Realignment of Street 6 south of Street 2 to avoid a woodland and significant wildlife habitat,
- Realignment of Street 6 to avoid crossing of seasonal environmental features.
- Street 8 direct connection to North Maple Regional Park entrance
- Identification of supporting infrastrucutre surrounding potential Kirby Grade Separation

Preliminary feasibility analysis supporting some of the above items was conducted and documented in the following sections.

5.2.2.1 STREET 2 ALIGNMENT AND GRADE SEPARATION

The Barrie GO rail line runs parallel and quite close to Keele Street within Block 27; as such, the ability to provide connections to Keele Street are limited, particularly with the need to plan for grade separation of all new roadways. An assessment of grade separation requirements and a preferred alignment are documented in **Appendix A**.

Further to the grade separation, consideration was made for an alignment that allows for a direct connection to and from the North Maple Regional Park, either for a vehicular connection or a pedestrian/cyclist connection at the northern edge of the Park.

5.2.2.2 STREET 5 CONNECTION TO CRANSTON PARK AVENUE RECOMMENDATIONS

A direct connection between Street 5 and Cranston Park Avenue, subject to further study, is recommended for the preferred transportation network. The refinement would provide essential transportation benefits, including:

- Connecting the existing neighbourhood south of Teston Road with the new Block 27 neighbourhood,
- Consolidating access points on Teston Road and improving traffic progression on the Regional Road, and
- Extending existing transit service from Cranston Park Avenue into Block 27 and potentially feeding into the planned transit hub of Kirby GO Station.

This connection poses a challenge due to the existing “Tributary A” culvert located directly across from Cranston Park Avenue. Preliminary assessment shows the issue may be addressed by diverting the watercourse. Taking into consideration the potential environmental sensitivity and other possible changes, the Street 5 connection with Cranston Park Avenue would be subject to a separate Environmental Assessment study. Supporting traffic analysis, potential tributary realignment and road realignment of Cranston Park Avenue to facilitate a connection were conceptualized to provide input to further study. This work is documented in a separate document attached to this report in **Appendix A**.

5.2.2.3 STREET 6 CROSSING OF THE NATURAL HERITAGE NETWORK

Street 6 traverses an environmentally significant area, which, based on field observations and data gathered, is part of a continuous system of terrestrial animal habitat. Although the Street 6 road crossing the Natural Heritage Network is included in the preferred collector network as it supports VOP 2010 Policy 4.2.1.23, the significant crossing across terrestrial wildlife habitat warrants a more detailed analysis and evaluation undertaken as part of the NVNCTMP and documented in further detail in **Appendix A**.

Key findings to inform future and further study of this connection include:

- The connection is beneficial from a multimodal connectivity standpoint:
  - Without the connection, traffic wishing to use the road would be required to detour approximately 400m west, 600m north or south, and 400m back east, a total of

1.4km. Providing the crossing of the NHN would reduce overall vehicle kilometres travelled by providing a more direct connection.
    - Pedestrians and cyclists would also be significantly affected and would also be required to detour; this would ultimately become a deterrent to walking and cycling. This is especially impactful due to the Kirby GO station facilities, planned community facilities and intensification identified on the north side of the NHN, so connectivity through the NHN would be extremely beneficial.
    - Transit routing would not be preferred on this particular north-south roadway under Option #2. While Street 5 would provide a continuous route for YRT transit service, any desire to route transit services on Street 6 spanning Block 27 would not be possible without the connection unless buses divert to Street 5.
- The design of Street 6 through the environmental area should be modified to be context sensitive in the environmental area to minimize impacts as much as possible, including methods such as minimizing right-of-way and pavement widths, a semi-urban type design and low-impact drainage methods.

5.2.2.4 FUTURE KIRBY GO STATION AND KIRBY GRADE SEPARATION

A preliminary feasibility assessment conducted by the NVNCTMP project team identified potential options to implement a grade separation of Kirby Road at the Barrie GO Rail line and provide access to the lands between the railway crossing and Keele Street along Kirby Road. These lands are potential GO station lands which would benefit from access to both Kirby Road and Keele Street. Furthermore, a grade separation at Kirby Road is recommended due to projected increases in traffic volumes on Kirby Road and Metrolinx plans for Regional Express Rail - all day, two-way GO rail service every 15 minutes. Further considerations for these lands are addressed later in this document in **Section 8.3**.

5.2.3 Recommended Road Classifications

Through the NVNCTMP it is recommended that Street 2, Street 5, and Street 8 be designated as Major Collector Roads requiring a 26m right-of-way width, and 14m of paved surface. Street 2 is the only east-west collector road connecting Jane Street to Keele Street through Block 27 and thus should be protected for 4 travel lanes, which may potentially serve as transit-exclusive or shared mobility lanes. Street 5 and Street 6 are the only two continuous north-south collector roads - however Street 6 requires a significant crossing through wooded areas while also having high water table conditions and discharge areas and is subject to further study. Street 5 should protect for 4 travel lanes on this basis. Finally Street 8 provides connectivity through Block 27 between the future Kirby GO station and the future North Maple Regional Park. Given higher density land uses surrounding the GO station it is recommended to protect for 4 lanes on Street 8, with further consideration for potential transit vehicles as well connecting to the GO station. These four lanes may potentially serve as transit exclusive or shared mobility lanes.

It is thus recommended that the design of Street 6 through the environmental area be modified to be context sensitive in the environmental area to minimize impacts as much as possible, including methods such as minimizing right-of-way and pavement widths, a semi-urban type design, and low-impact drainage methods. The remaining streets identified in the Draft Block 27 plan are minor collector roads.

5.3 Block 41 Secondary Plan (DRAFT)

At the time of this report, the Block 41 Secondary Plan is in draft and subject to change. The NVNCTMP documents the technical work that was conducted to inform the Block 41 Secondary Plan including the alternatives analyzed to arrive at the recommended network. The Emerging Land Use Concept Report for the Block 41 Secondary Plan was released on October 9, 2015. The report provides details on the land use, urban design, transportation, servicing and storm water management, and sustainability and community energy for the development of the Block.

New Community Area Block 41 is bounded by Kirby Road to the north, Weston Road to the east, Teston Road to the south, and Pine Valley Drive to the west. It has an area of approximately 450 hectares (1,100 acres) designated as low-rise residential in VOP 2010 Schedule 13. The majority of the land is made up of rural and agricultural land uses, however there is an existing rural residential neighbourhood located in the northwest corner of the Block and a few residential land uses to the south on Teston Road. There is also a TransCanada compressor station located in the northeast quadrant of the Block.

The vision for Block 41 is to have a sustainable and vibrant new community. The Block is designed to protect the natural and built heritage while also designing efficient development patterns and a variety of residential densities. The concept plan for land use and transportation for Block 41 includes:

- Five distinct neighbourhoods that will be served by commercial / mixed used nodes and community facilities,
- An integrated street network to connect homes, shops, schools, and adjacent communities,
- A recreational trail system connecting to the proposed TransCanada Pipeline Trail,
- A vast system of natural areas that define neighbourhood boundaries, and
- Jog eliminations of Pine Valley Drive at Kirby Road and at Teston Road.

5.3.1 Draft Land Use Plan

Table 5-3 provides the breakdown of population and employment for Block 41. **Exhibit 5-5** illustrates the land use plan. Block 41 has an existing neighbourhood located in the northwest quadrant of the Block, therefore the major developments will occur in the northeast, southeast, and southwest quadrants. Similar to Block 27, the land use is primarily composed of residential units. It is noted that the plan illustrated is as of December 2016, with quadrant allocations for the purposes of transportation analysis and modelling and subject to change as the Block 41 Secondary Plan is finalized.

Table 5-3: Block 41 Population and Employment

Quadrant	2031 Population	2031 Employment
Northwest	280	50
Northeast	6,580	710
Southwest	690	0
Southeast	4,570	250
Total	**12,120**	**1,010**

Source: Draft Block 41 Secondary Plan, City of Vaughan, December 2016*
*NOTE: Assumed growth totals for the purposes of transportation analysis and modelling to inform the NVNCTMP study. Subject to change as the Block 41 Secondary Plan is finalized.

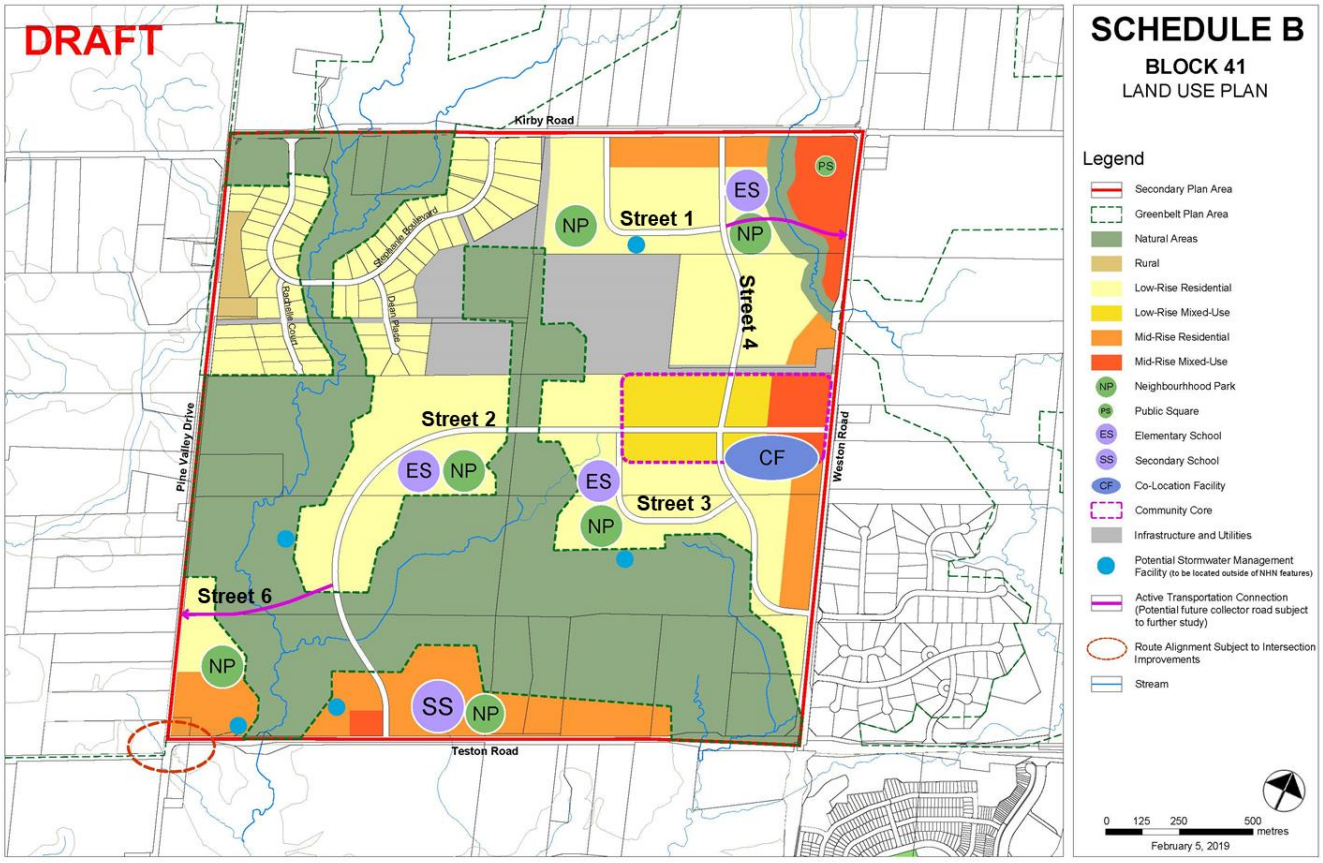

Exhibit 5-5: Block 41 Draft Land Use Plan
Source: Block 41 Public Hearing, February 13, 2019

5.3.2 Transportation Network Development

The NVNCTMP study provided input to the development of the transportation network in Block 41. Details on the analysis and recommendations for this are provided in **Appendix B**. Three alternative transportation networks were identified for Block 41:

1. Preliminary Network with Background Information provided by Block 41 Landowners Group (updated June 2017)
2. Initial City Network (October 2016)
3. Refined City Network (December 2016)

Similar to the development of the Block 27 Transportation Network Alternatives, detailed evaluation criteria under each of the following categories were used in the assessment:

- Transportation
- Natural Environment
- Socio-Economic Environment
- Cost and Implementation

The overall evaluation of the alternatives identified ***the Refined City Network, Alternative 3, as the preferred collector network for Block 41*** *as summarized in* **Table 5-4.** The evaluation used a 3-point scale from least supportive (○) to most supportive (●).

Table 5-4: Overall Evaluation of Alternatives for Block 41

Criteria	Alternative 1	Alternative 2	Alternative 3
Transportation	○	◑	●
Natural Environment	●	◑	○
Socio-Economic Environment	◑	◑	●
Implementation	●	●	◑
OVERALL SCORE	4 SCREEN OUT	4.5 SCREEN OUT	5.5 CARRY FORWARD

Through the analysis of network options, the preferred Block 41 Land Use Plan and Multi-Modal Transportation Network, were presented at the Block 41 public hearing February 13, 2019. The Land Use Plan and Multi-Modal Transportation Network are presented in **Exhibit 5-6** and **Exhibit 5-7**, respectively.

It should be noted that the evaluation presented is preliminary, further and more comprehensive review of the constraints in the area is required prior to construction and should include identification of all natural heritage features, natural (erosion and flood) hazards, and hydrogeological site conditions.

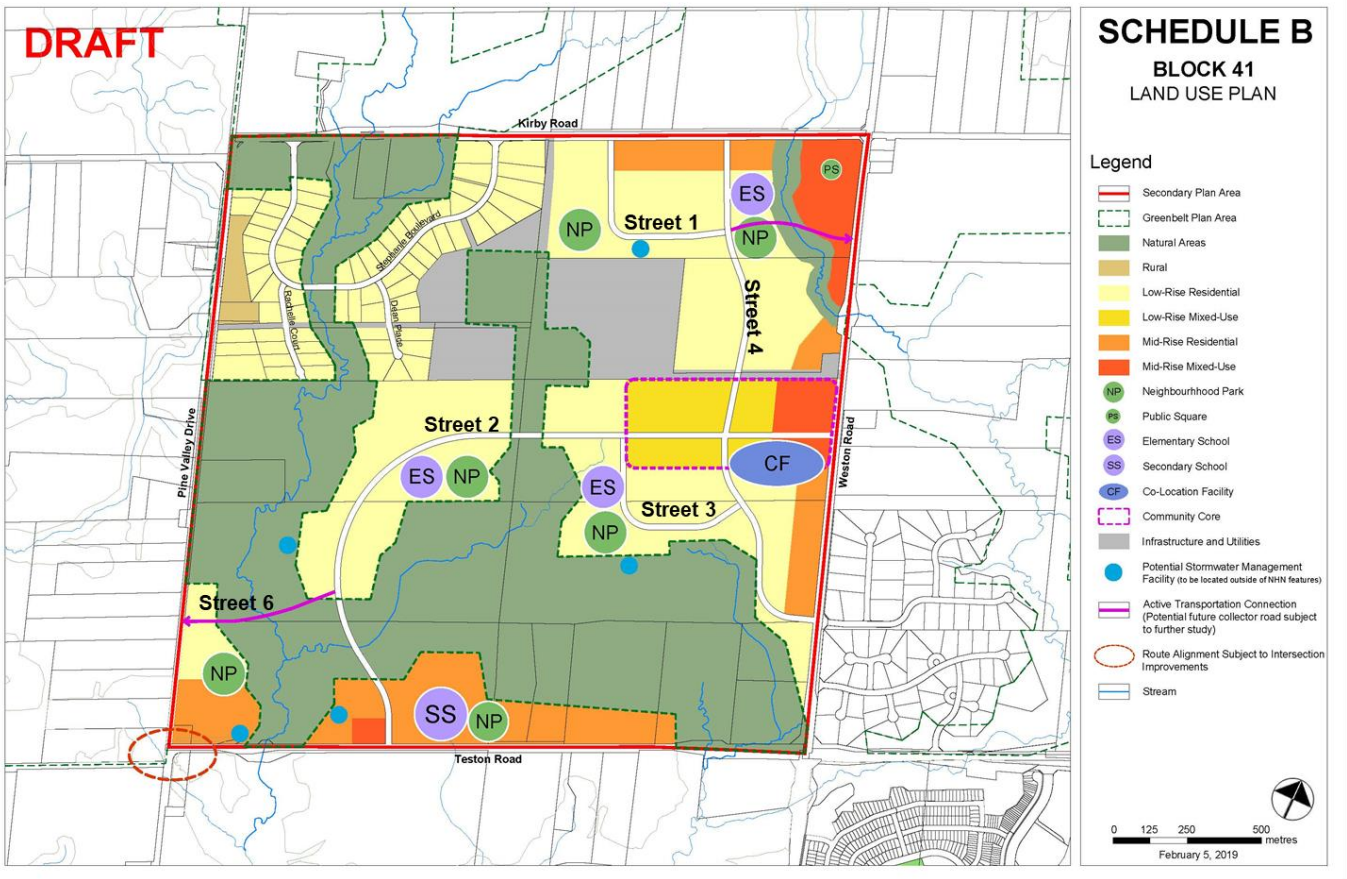

Exhibit 5-6: Block 41 Draft Land Use Plan
Source: Block 41 Public Hearing, February 13, 2019

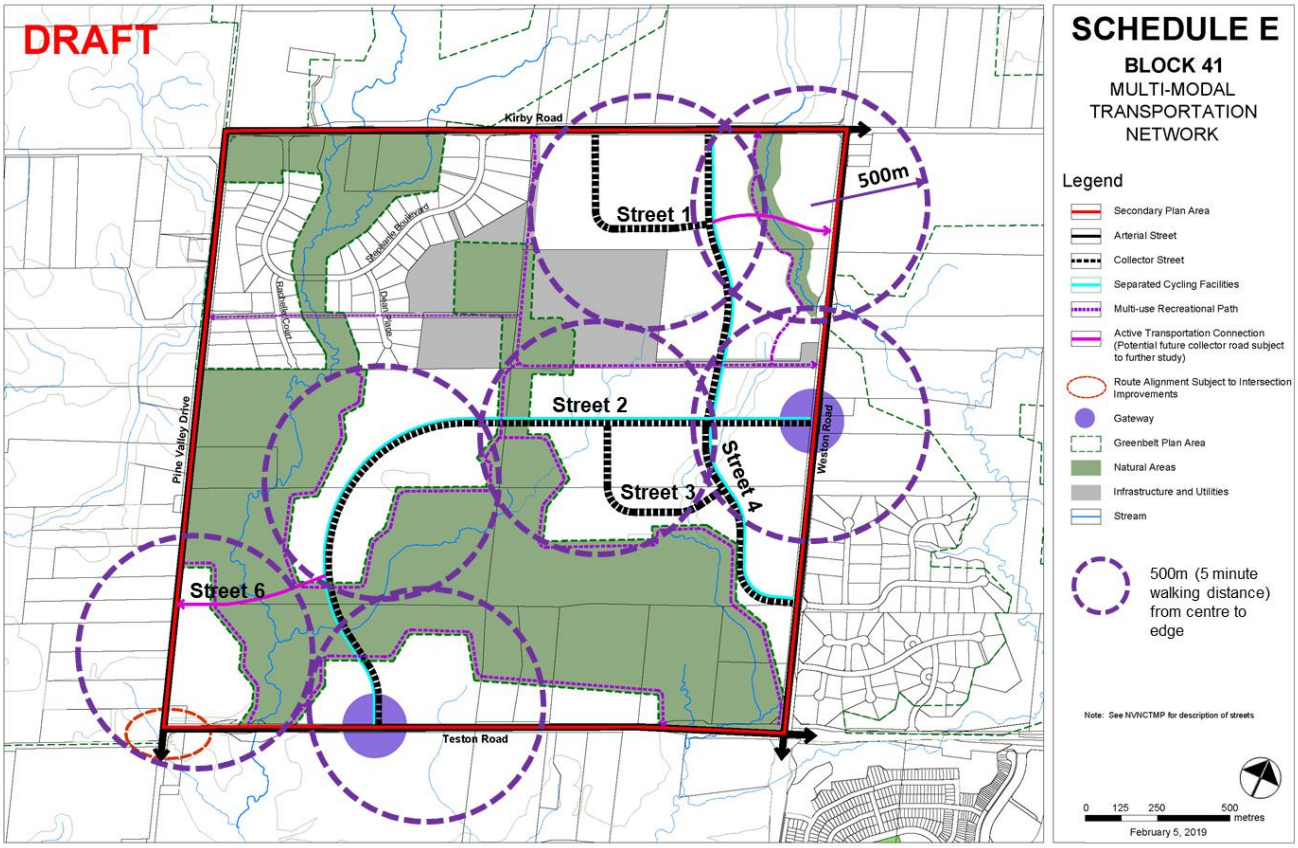

Exhibit 5-7: Block 41 Draft Multi-Modal Transportation Network
Source: Block 41 Public Hearing, February 13, 2019

Additional discussion on the roadways identified but flagged as subject to further revision are discussed in the following sections.

5.3.2.1 STREET 1 EXTENSION TO BLOCK 34

The Street 1 extension would provide an additional connection to Weston Road, Block 34, and would curve north to connect to Kirby Road. However this connection crosses a section of the East Humber River. As a result, it is recommended that this extension from Street 4 to Weston Road is constructed as an active transportation connection to minimize the effect on the natural environment. The active transportation connection would allow pedestrians and cyclists to connect from Block 41 to Block 34 and has a minimal right-of-way, minimizing the natural environmental impact.

The Street 1 extension to Block 34 will be carried forward as an active transportation only connection.

5.3.2.2 STREET 6 CONNECTION TO PINE VALLEY DRIVE

Street 6 would provide a direct connection between Street 2 to Pine Valley Drive. However, connection would cross the Natural Heritage Network, wetlands, woodlands, and a critical habitat that was documented by the MNRF.

The Street 6 connection was initially added to facilitate a major north-south arterial connection to the GTA West Corridor which planned for an interchange at Pine Valley Drive. As the GTA West Corridor EA will be restarting as per Ontario 2018 Fall Economic Statement, it is recommended that the corridor continue to be protected for a potential road corridor in the future.

As a result of the environmental impacts of this crossing, it is recommended that Street 6 be provided an active transportation connection as this type of connection has a minimal right-of-way and can be integrated with the existing natural features. This would provide a connection for pedestrians and cyclists from Street 2 to Pine Valley Drive.

The Street 6 connection to Pine Valley Drive will be carried forward as an active transportation only connection.

Details regarding the identification and development of the alternative transportation networks, evaluation methodology, recommendations and refinements to the recommended network are provided in **Appendix B** for Block 41.

5.3.3 Recommended Road Classifications

Based on the forecasted traffic demand and functionality of the network, NVNCTMP recommends that the roads identified in the Draft Block 41 Secondary Plan be designated as minor collector roads with 24 m ROW.

5.4 Future Travel Demand

The York Region EMME travel demand model was used to estimate future travel demand for the baseline future traffic conditions. Details on the modelling assumptions, model calibration, and methodology to forecast future travel demand are provided in **Appendix D - Transportation Analysis and Modelling**.

To establish the problem and opportunity, a future 2031 travel demand scenario is tested against the existing, or “Do-Nothing” transportation network. This scenario accounts for future growth including the development of the New Community areas and Highway 400 Employment Area, but does not include any longer-term planned road or transit infrastructure improvements beyond the existing network plus committed, funded construction projects (i.e. widening of Major Mackenzie Drive from four to six lanes between Highway 27 and Jane Street which was completed in 2018). It also includes the local collector network in the New Community areas and the Highway 400 North Employment Area as this network is required to support the development. **Exhibit 5-8** illustrates the transportation network. In this scenario, significant traffic congestion is projected. Screenline V/C ratios are shown in **Exhibit 5-9** for peak direction AM east-west traffic, and **Exhibit 5-10** for peak direction AM north-south traffic.

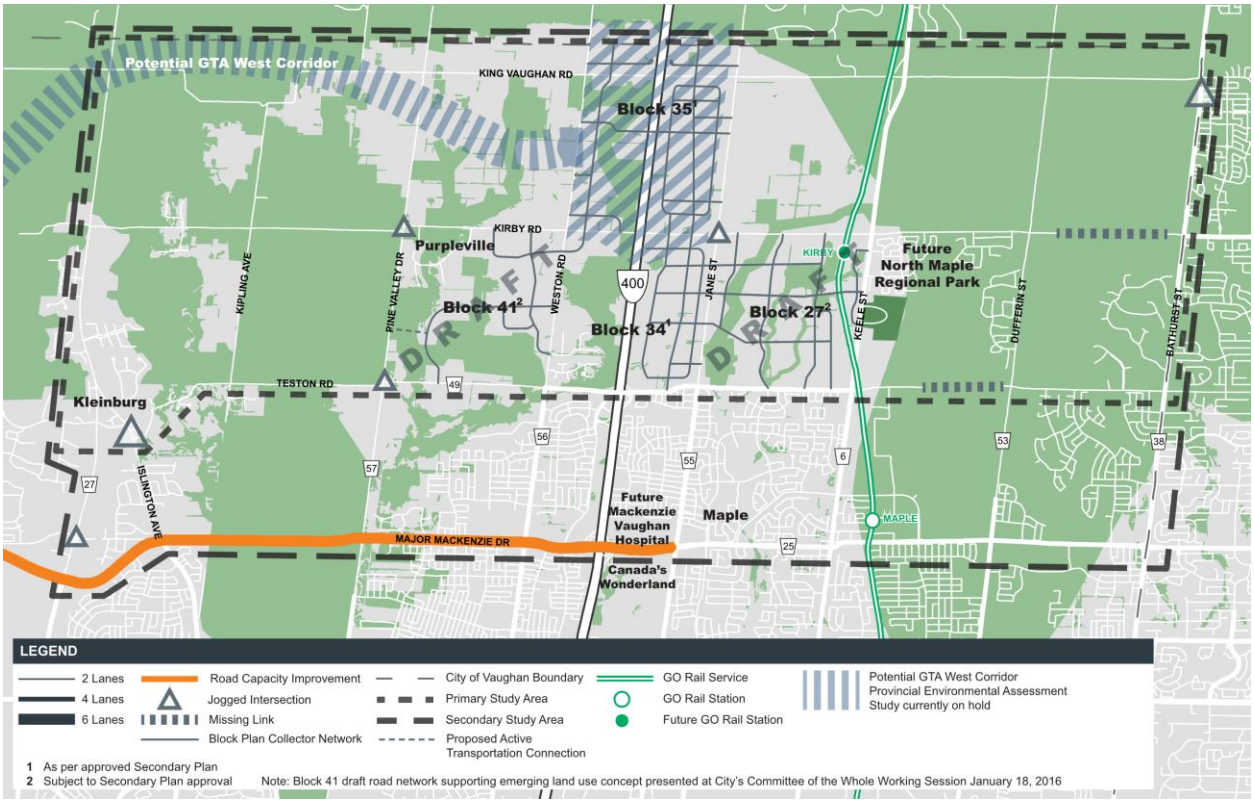

Exhibit 5-8: Future 2031 "Do Nothing" Transportation Network

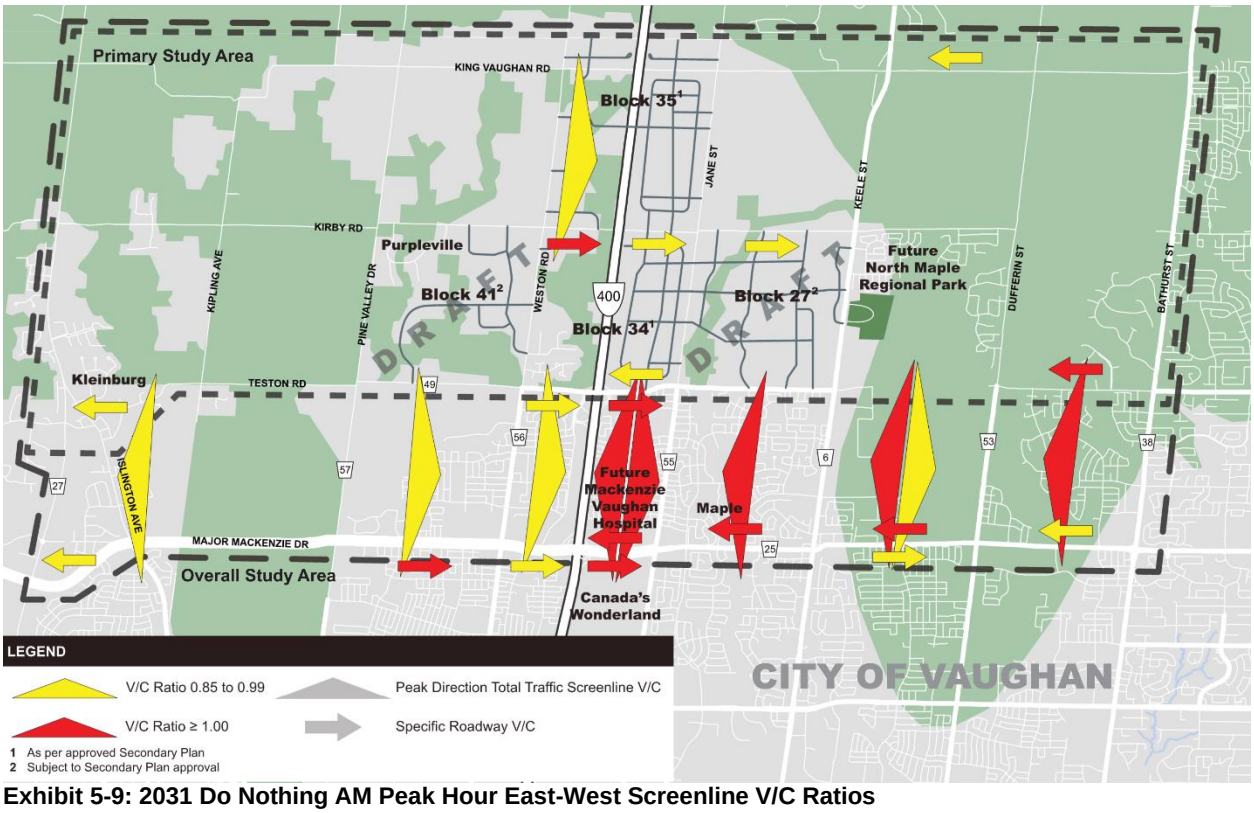

Exhibit 5-9: 2031 Do Nothing AM Peak Hour East-West Screenline V/C Ratios

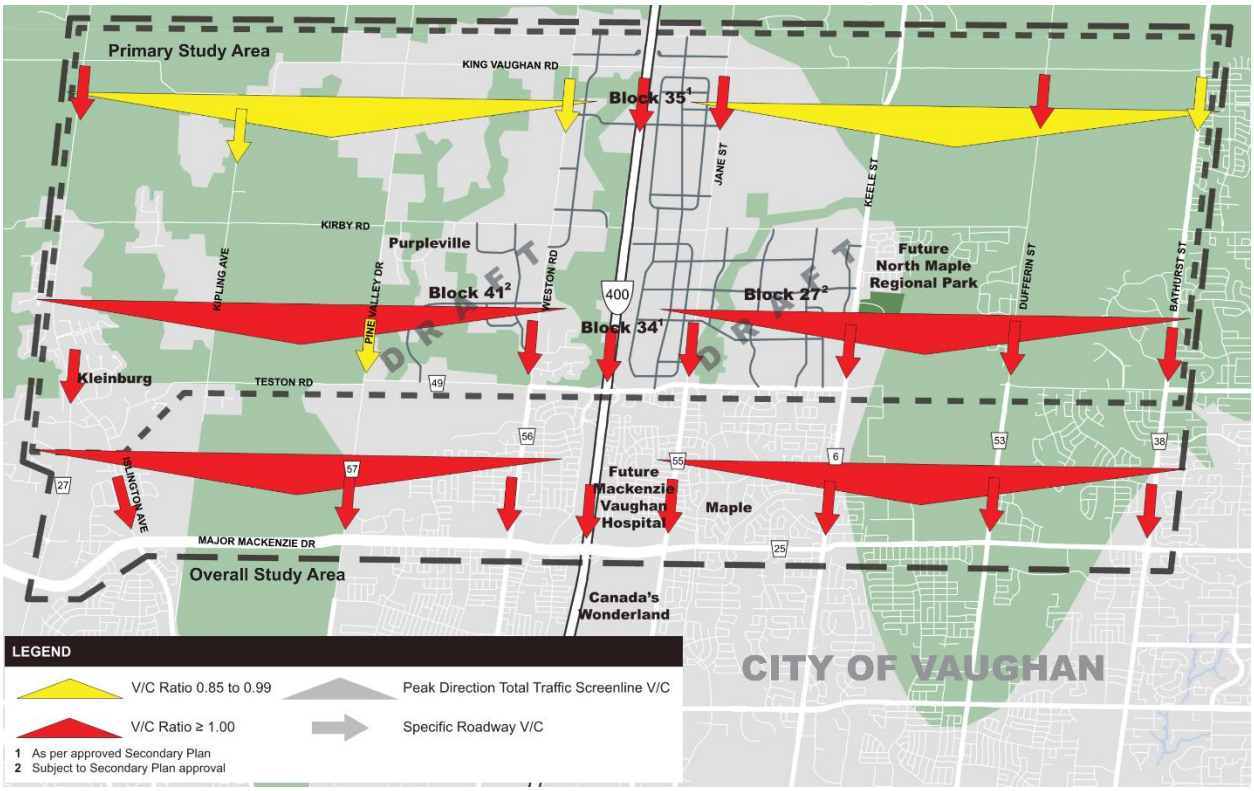

Exhibit 5-10: 2031 Do Nothing AM Peak Hour North-South Screenline V/C Ratios

Major Mackenzie Drive is congested both ways east of Highway 400 as the network is over capacity at these locations. There is also some congestion eastbound on Kirby Road due to the development of the New Community Areas.

All southbound traffic experiences congestion when approaching Teston Road as the north-south arterials are over capacity. Without any improvements to the transportation network and increase in traffic volumes, it is expected that the road network will experience severe congestion and therefore negatively impact the community.

6 The Transportation Vision

6.1 Problem and Opportunity Statement

Based upon the preceding findings through review of the planning context, public consultation, and review of existing and future conditions, and Problem and Opportunity Statement was identified as follows:

The NVNCTMP study area is in need of capacity and operational improvements with regards to transportation network supply for all travel modes. The rural nature of the area, limited transit service and limited active transportation facilities have resulted in the overwhelming automobile dependency by local residents. In addition, several network gaps, sub-standard road cross-sections, and challenging vertical alignments have reduced connectivity, safety, and led to overburdened east-west and north-south continuous links such as Major Mackenzie Drive and Highway 400.

Through the development of the New Communities and the Highway 400 North Employment Area, opportunities exist to build upon existing plans to provide better connectivity and continuity by bridging gaps, connecting to the provincial highway network, eliminating jogs, expanding transit service to the study area, improving cross-sections and slopes, and providing active transportation facilities to reduce the reliance on the automobile.

6.2 Transportation Vision

The Transportation Vision for the NVNCTMP study area builds upon the City's strategic vision of transformation into a vibrant, beautiful and sustainable City.

The North Vaughan and New Communities will establish a comprehensive transportation network that allows a full range of mobility options including transit, walking, cycling, and place making initiatives with an emphasis on creating more pedestrian and transit-friendly streets that are connected, safe, and accessible for users of all ages and abilities.

The Transportation Vision of the TMP will address the following key objectives:

1. Assess the demand and impact of the Major Growth Area developments within or in close proximity to the study area.
2. Identify and evaluate alternative vehicular and non-vehicular transportation networks and provide recommendations, including phasing of transportation network improvements
3. Ensure and promote attractiveness/ competitiveness of employment opportunities in the study area, especially the Highway 400 Employment Lands.
4. Support the establishment of a new Kirby GO station (in Block 27) in accordance with the policies of the Metrolinx "Mobility Hub Guidelines".
5. Encourage all modes of transportation by providing well connected and attractive pedestrian and cycling networks that directly lead to "destinations" and/or public transit stations.
6. Take into consideration the impact on adjacent lands and transportation network through a comprehensive and inclusive public consultation process.

7 Alternative Networks

Two network alternatives were identified and assessed against the vision to ultimately select a preferred network. Each alternative assumed the collector road networks identified for Blocks 27, 34, 35 and 41 as presented in **Section 5**. The alternatives considered for the NVNCTMP are:

Alt. #	Alternative	Description
1	York Region Transportation Master Plan	Planned Regional Transportation Improvements, without the GTA West Corridor as the Provincial EA Study was on hold. A sensitivity test was considered.
2	Enhanced Network	Planned Regional Transportation Improvements without the GTA West Corridor. It also includes the addition of midblock crossings and the reconstruction of several arterial roads. Three additional sub-strategies are also considered.

The above two scenarios recognize that the GTA West Corridor is still under review through the Northwest GTA Corridor Identification Study, and as such sensitivity tests were conducted to inform the analysis of alternatives, which is described in the following sections.

7.1 Alternative Network 1 – York Region TMP

7.1.1 York Region Transportation Master Plan without GTA West Corridor

Alternative Network 1 incorporates the planned regional transportation improvements from the York Region Transportation Master Plan (2016) without the GTA West Corridor since the study was on hold at the time of this analysis, and the suspended EA from 2015 is pending to be resumed. As noted in **Section 2.1.1**, the City will continue to plan and protect for this corridor beyond the 2031 horizon year of this study. **Exhibit 7-1** illustrates the transportation network reflecting Alternative 1, and the major transportation improvements to the Study Area are listed as follows:

- Highway 400 interchange at Kirby Road,
- Road widening from two to four lanes of:
  - Highway 27 from Major Mackenzie Drive to King Road,
  - Pine Valley Drive from Major Mackenzie Drive to Teston Road,
  - Weston Road from Teston Road to Kirby Road,
  - Jane Street from Teston Road to Kirby Road,
  - Dufferin Road from north of Major Mackenzie Drive to Teston Road,
  - Teston Road from Pine Valley Drive to Weston Road and from Keele Street to Yonge Street, and
  - Kirby Road from Weston Road to Bathurst Street.

- Road widening from four to six lanes of Major Mackenzie Drive from Weston Road and east for Viva Rapidway,
- Road widening from four to six lanes of Bathurst Street from Kirby Road to Highway 407,
- Connection of Teston Road from Keele Street to Dufferin Street,
- Connection of Kirby Road from Dufferin Street to Bathurst Street,
- New mid-block crossing between Major Mackenzie Drive and Teston Road,
- Jog eliminations of:
    - Kirby Road and Pine Valley Drive,
    - Kirby Road and Jane Street, and
    - Teston Road and Pine Valley Drive,
- Grade separation of the Barrie GO Rail at Kirby Road and Teston Road,
- Kirby GO Rail Station,
- Regional Express GO Rail Service (all-day 2-way service on the Barrie GO Line),
- Viva service on Major Mackenzie Drive and Jane Street, and
- Implementation of a Frequent Transit Network[2] (FTN) to service:
    - Teston Road east of Pine Valley Drive,
    - Kirby Road east of Weston Road,
    - Pine Valley Drive south of Teston Road,
    - Weston Road, Jane Street, Keele Street, and Dufferin Street south of Kirby Road, and
    - Bathurst Street from Newmarket south to Toronto.

These improvements will help add capacity to the road network, in addition to improving the connectivity of the arterial network through the elimination of the jogged intersections. The FTN will also help improve transit service in the Study Area as it will connect the development of the New Communities and Highway 400 Employment lands to the proposed Kirby GO Station, VMC, the rest of Vaughan, and to the City of Toronto. The Viva Rapid Transit network, including Yonge Street and the proposed Jane Street and Major Mackenzie Viva route, will also be accessible to North Vaughan commuters through the frequent transit services.

Inter-regional transit services will be improved in the Study Area through the addition of the Kirby GO Station. Metrolinx has included Kirby GO Station as one of the new stations along Barrie Corridor in the June 28, 2016 Board of Directors Report for the GO Regional Express Rail (RER) 10-Year Program. In addition to the Kirby GO Station, Metrolinx's RER program is planning for all-day two-way service using faster, electric trains at a service frequency of every 15 minutes.

[2] Frequent Transit Network service is defined as bus service every 15 minutes or less between 6AM and 10PM, seven days a week.

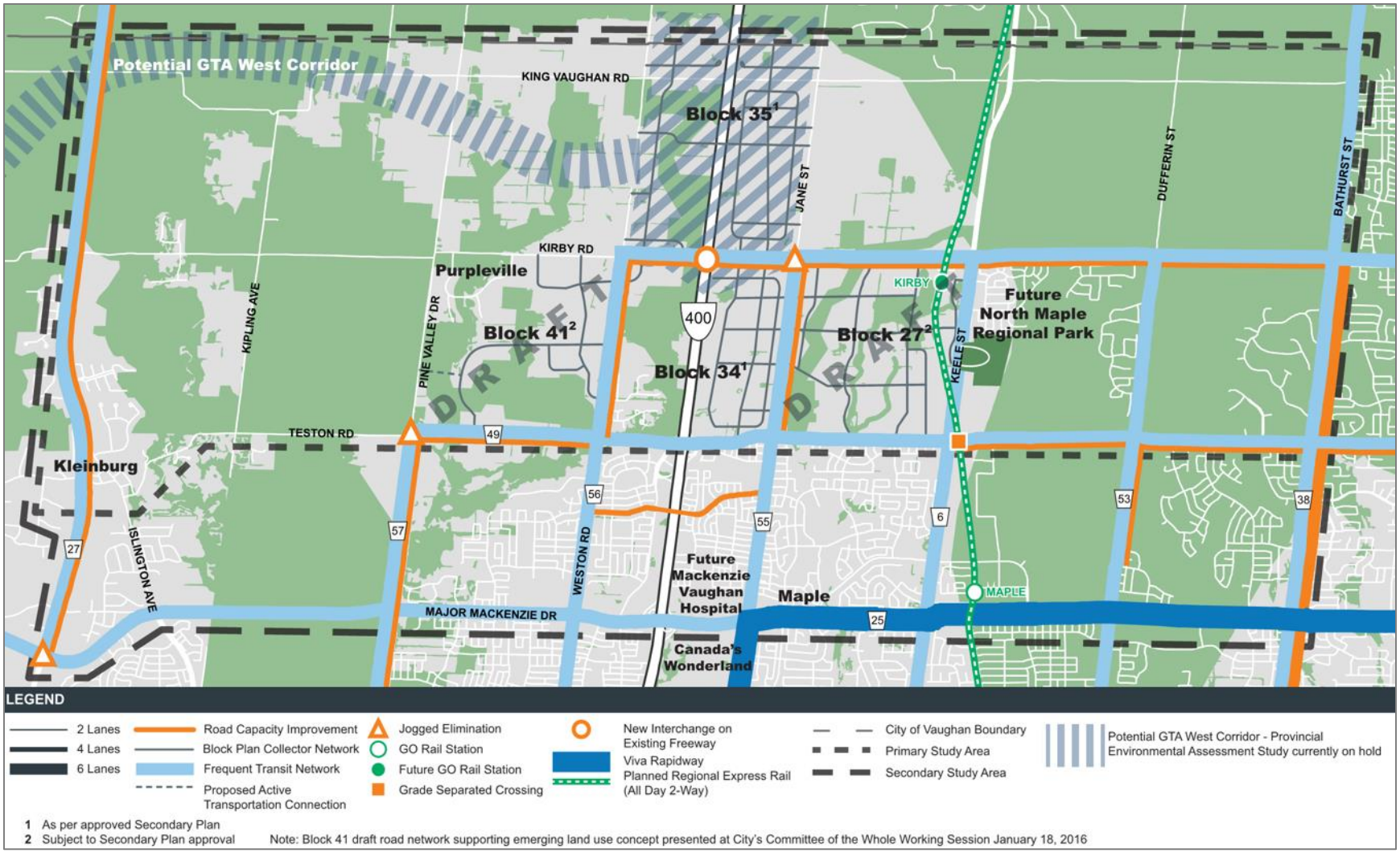

Exhibit 7-1: Alternative 1 – York Region TMP
Note: Potential GTA West Corridor Protection Area illustrated as per Vaughan Official Plan, 2014

7.1.2 York Region TMP Sensitivity with GTA West Corridor

As the GTA West Corridor EA is pending to be resumed, a sensitivity test was developed to determine the effect that the GTA West Corridor has on the transportation network. As noted in **Section 2.1.1**, the City will continue to plan and protect for this corridor beyond the 2031 horizon year of this study. **Exhibit 7-2** illustrates the transportation network.

An evaluation of Alternative Network 1 with and without the GTA West Corridor was conducted to determine the effect of the GTA West Corridor based on delay in the Study Area. Delay was calculated using vehicle-kilometres travelled (VKT) and vehicle-hours travelled (VHT). **Table 7-1** illustrates the percentage of VKT and VHT that is congested (v/c ratio ≥ 1.00) within the Study Area. The percentage congested of VKT illustrates the percentage of kilometres travelled in congestion while the percentage congested of VHT illustrates the percent of commute time spent in congestion. VKT is calculated by multiplying the number of vehicles using a road segment and the length of the segment. VHT is calculated by multiplying the number of vehicles using a road segment and the segment travel time.

While the GTA West Corridor is an important transportation corridor for longer distance travel in the northwest GTA, it is notable from this sensitivity test (**Table 7-1)** that the GTA West Corridor has a significant impact on congestion in the Study Area. While the GTA West Corridor improves longer distance travel to Peel Region, the total vehicle-kilometres travelled in congestion increases by about 40% (20,450 vehicle kilometres), and congested vehicle-hours travelled increases by 35% (1,000 vehicle-hours). This suggests that supporting infrastructure improvements to disperse traffic from the terminus of the GTA West Corridor at Highway 400 are likely required. Should this corridor ever be built as a freeway, the City should plan and protect for potential support corridors within Block 35.

Table 7-1: Study Area Delay of Alternative 1 with and without GTA West Corridor Freeway

Arterial + Local Roads	With GTA West	Without GTA West
Congested VKT	52,550	32,100
% Congested	23%	15%
Congested VHT	2,300	1,300
% Congested	36%	24%

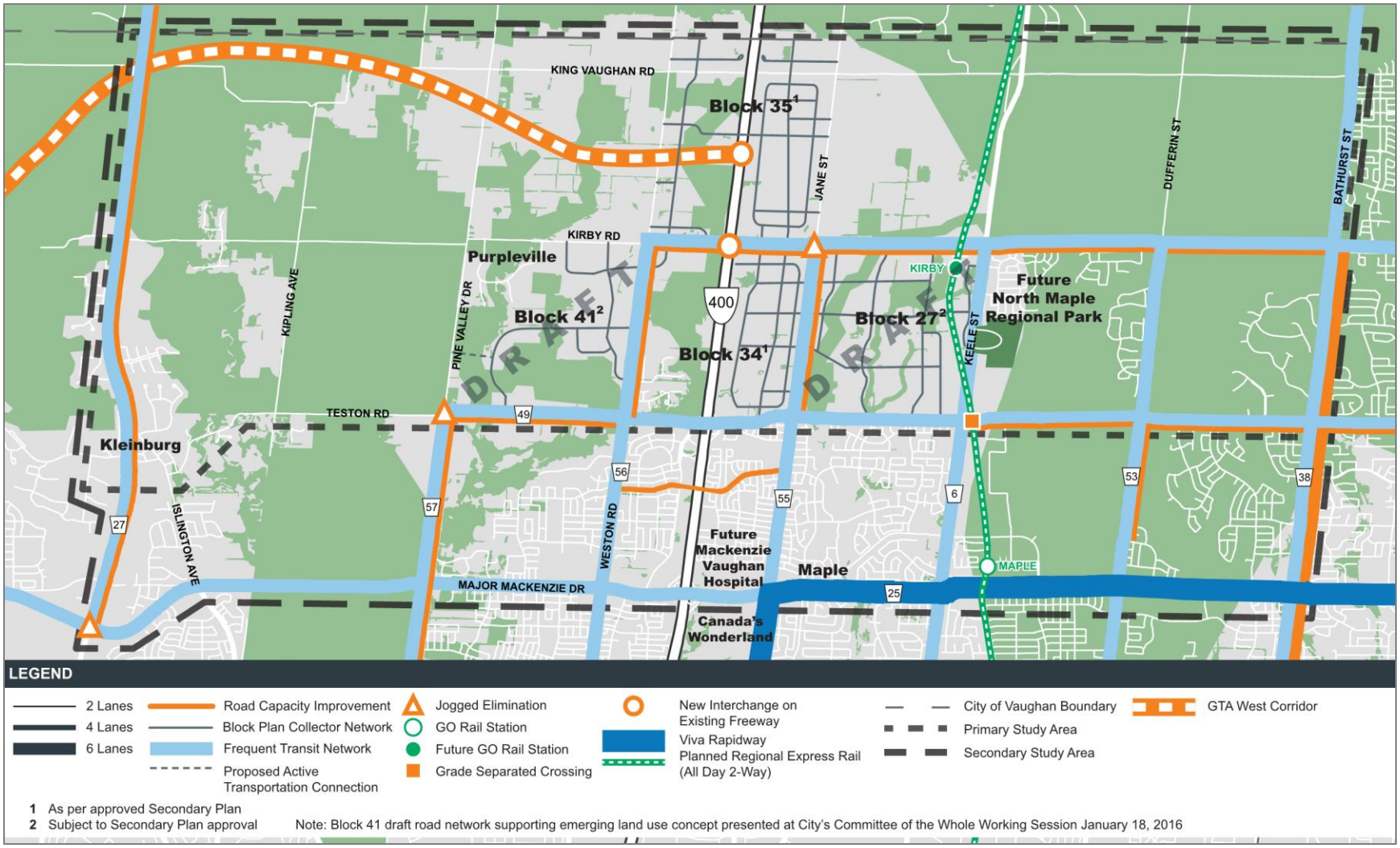

Exhibit 7-2: Alternative 1 Sensitivity Test – York Region TMP with GTA West Corridor
Note: GTA West Corridor alignment illustrated as per Vaughan Official Plan, 2014

7.2 Alternative Network 2 – Enhanced Network

Alternative Network 2 builds upon Network 1 with the addition of localized improvements. The enhancements to the study area are as follows:

- Reconstruction of Pine Valley Drive from Teston Road to Kirby Road,
- Reconstruction of Kirby Road from Highway 27 to Weston Road, and
- At least one midblock crossing over Highway 400 between Teston Road and King-Vaughan Road.
- Urbanization of Keele Street

The road reconstruction of Pine Valley Drive and Kirby Road refers to reconstruction of the underlying pavement structure and the addition of shoulder areas to the roadway within the existing right-of-way (ROW). These improvements should increase safety for all road users and accommodate higher levels of traffic and active transportation.

In order to improve connectivity of the Highway 400 Employment Areas and support the arterial network, at least one midblock crossing over Highway 400 is proposed between Teston Road and King-Vaughan Road.

Finally, the urbanization of Keele Street would add curb and gutter along the roadway and active transportation facilities to support growth in Block 27 and the North Maple Regional Park.

Exhibit 7-3 illustrates the transportation network for Alternative Network 2.

Two sensitivity analyses were also conducted to understand the network impacts of not including certain improvements in the Study Area. These sensitivity analyses, listed below, are discussed in the following sections.

1. 2A – Alternative 2 Minus Kirby Road by 2031
2. 2B – York Region Development Charges (2017) with Kirby Road Improvements and Enhancements

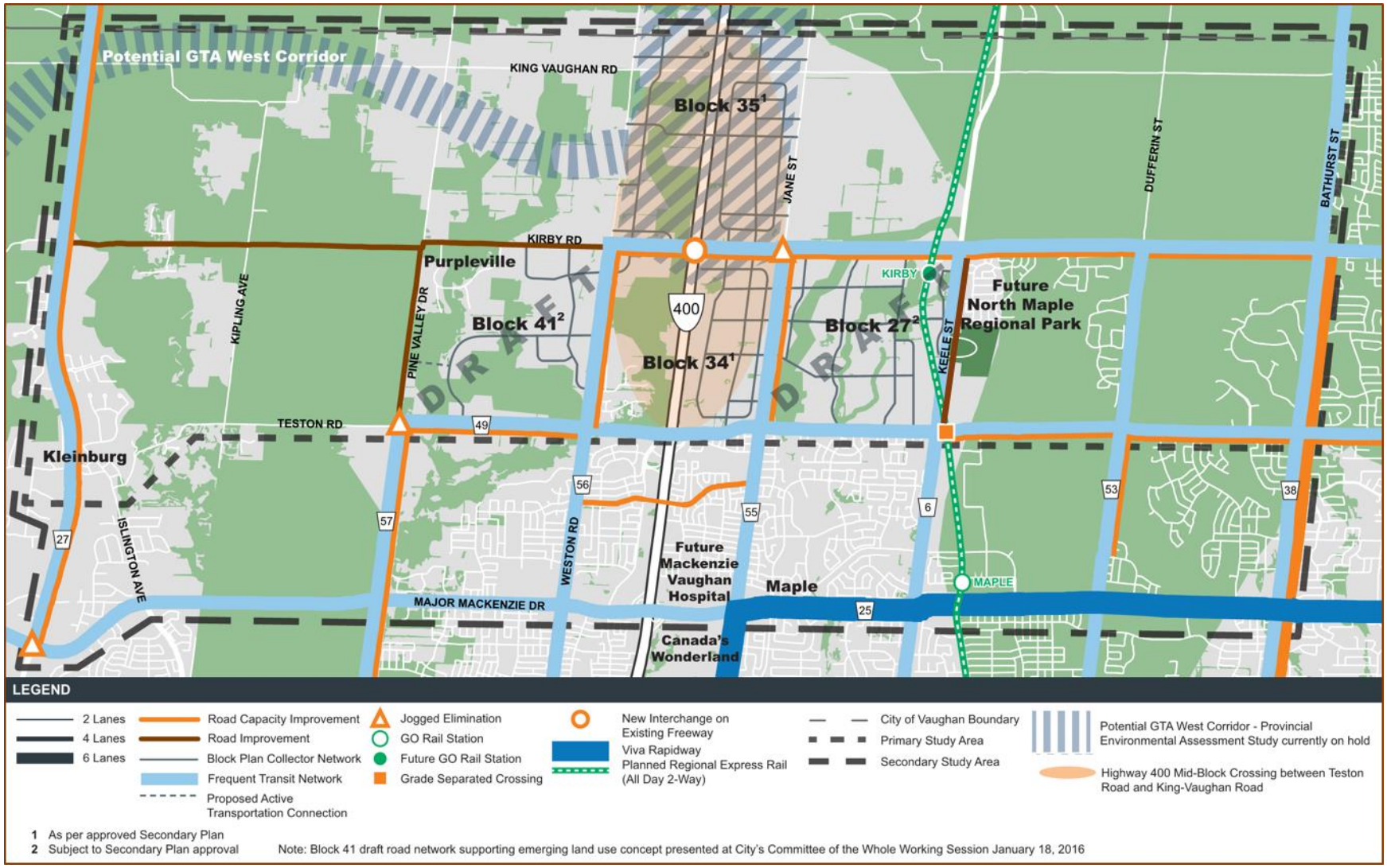

Exhibit 7-3: Alternative 2 - Enhanced Network
Note: Potential GTA West Corridor Protection Area illustrated as per Vaughan Official Plan, 2014

7.2.1 Sensitivity Analysis 2A – Alternative 2 Minus Kirby Road

Sensitivity analysis 2A was developed in order to analyze the effects on the transportation network if the Kirby Road missing link is not constructed by 2031. **Exhibit 7-4** illustrates the road network without the Kirby Road missing link. Without this link, personal vehicles and transit routes on Kirby would have to divert to Teston Road or King Vaughan Road between Dufferin Street and Bathurst Street, adding significant travel time to the route. In addition, users heading to Kirby GO Station from the west would have to also divert as no direct connection would exist on Kirby Road. Furthermore, Kirby Road is planned as a strategic goods movement corridor in the YRTMP.

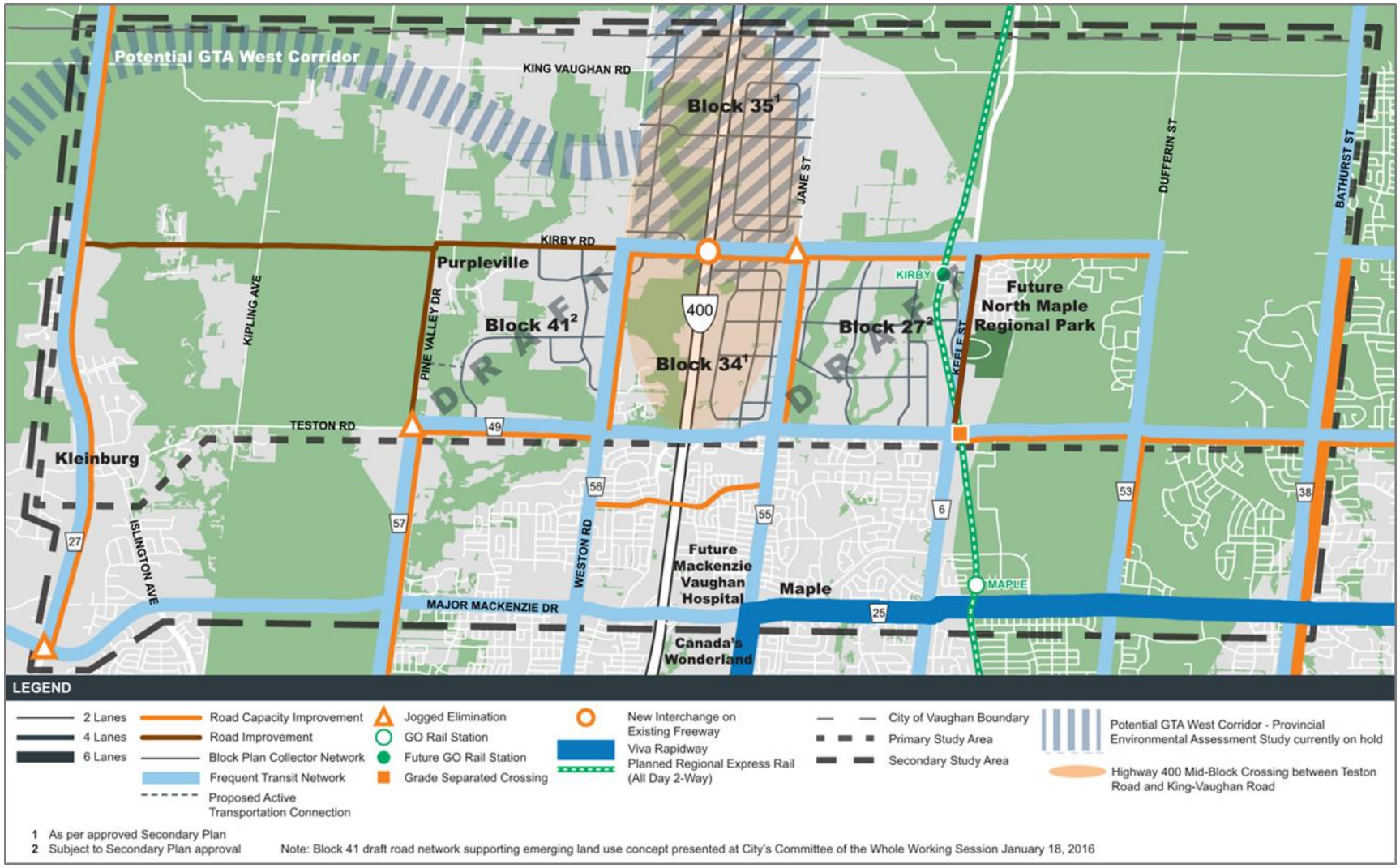

Exhibit 7-4: Alternative 2 Sensitivity Test 2A - without Kirby Missing Link
Note: Potential GTA West Corridor Protection Area illustrated as per Vaughan Official Plan, 2014

7.2.2 Sensitivity Analysis 2B – York Region Development Charges (2017) with Kirby Road Improvements and Enhancements

The York Region 2017 Development Charge Background Study identifies the anticipated development in York Region. The 2017 Development Charge Bylaw included a two-part contingency schedule (Part A & B of Contingency Schedule G) that would only become part of the Bylaw should certain conditions be met. 82 road projects (Region-wide) from the 2016 Transportation Master Plan were placed on the Contingency Schedule G.

Through the 2018 Development Charge Background Study and Bylaw Amendment adopted by York Region Council on May 17, 2018, 56 road projects in "Part B" of Contingency Schedule G were included in the rate calculation.

Capital projects in "Part B" of Contingency Schedule G that were added back into the Development Charge Bylaw and located in the study area include:

- Road widening from two to four lanes:
  - Highway 27 from Teston Road to King Road,
  - Weston Road from Teston Road to Kirby Road,
  - Jane Street from Teston Road to Kirby Road, and
  - Dufferin Road from north of Major Mackenzie Drive to Teston Road
- Grade separation of the Barrie GO Rail at Teston Road east of Keele Street

Projects that remained excluded from the Bylaw that are within the study area include:

- Highway 400 interchange at Kirby Road,
- Road widening from two to four lanes of:
  - Kirby Road from Weston Road to Bathurst Street.
- Connection of Teston Road from Keele Street to Dufferin Street,
- Connection of Kirby Road from Dufferin Street to Bathurst Street,
- New mid-block crossing between Major Mackenzie Drive and Teston Road, and
- Grade separation of the Barrie GO Rail at Kirby Road.

Although the improvements along Kirby Road remained outside the 2017 Development Charge Bylaw (Highway 400 interchange, missing link, road widening, and grade separation), these projects were included in the analysis to improve the connectivity of Kirby GO Station to the transportation network, in light of the announcement in February 2018 confirming the inclusion of this GO Station in the RER expansion program.

The analysis also included the enhancements outlined in **Section 7.2** as these improvements will be carried forward by the City. **Exhibit 7-5** illustrates the transportation network of Sensitivity Analysis 2B.

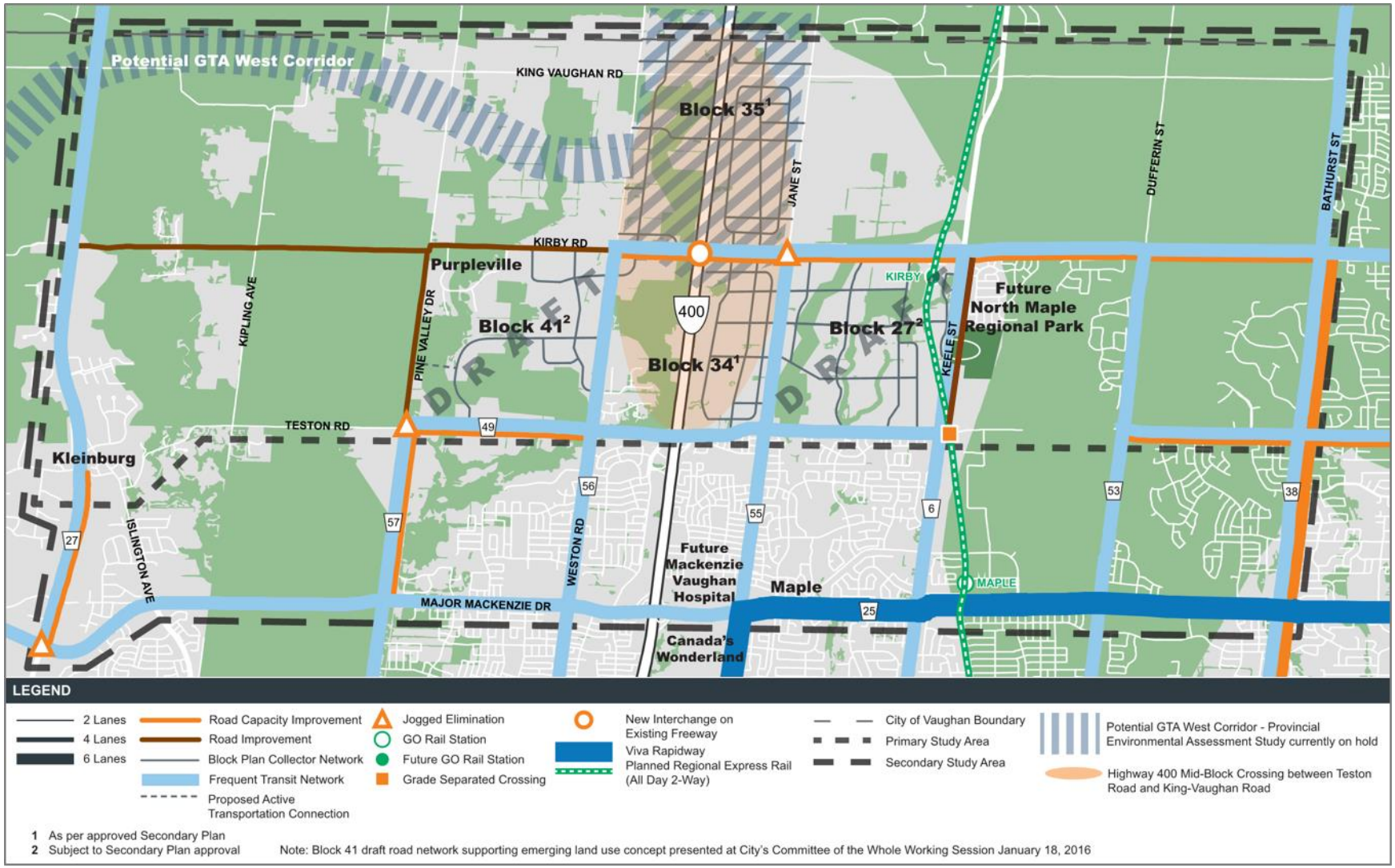

Exhibit 7-5: Alternative 2 Sensitivity Test 2B – York Region DC Study + Kirby Road Improvements
Note: Potential GTA West Corridor Protection Area illustrated as per Vaughan Official Plan, 2014

7.2.3 Evaluation of the Sensitivity Strategies

An evaluation of Alternative 2 and its sensitivity analyses was conducted to determine the effect of each sensitivity analysis based on delay in the Study Area. **Table 7-2** illustrates the percentage of VKT and VHT that is congested (v/c ratio ≥ 1.00) within the Study Area. The percentage congested of VKT illustrates the percentage of kilometres travelled under congested conditions while the percentage congested of VHT illustrates the percent of commute time spent in congested conditions.

Alternative 2's enhanced network minimizes the kilometres travelled and hours spent in congestion compared to the sensitivity strategies. Without the Kirby Road missing link, as described in Sensitivity Analysis 2A, over 4,000 extra kilometres are spent in congestion due to vehicles that are required to re-route to the already congested Teston Road or to King-Vaughan Road. This translates to an additional 150 hours spent in congestion overall in the Study Area.

Sensitivity Analysis 2B has the highest percentage of congested vehicle travel distance and travel time. With several projects in the study area excluded from the 2017 Development Charge Bylaw, as mentioned in **Section 7.2.2**, resulting in over 14,000 additional kilometres and over 1,000 additional hours spent in congestion compared to the enhanced network.

Table 7-2: Study Area Delay of Strategy 2 and Sensitivity Strategies

Arterial + Local Roads	Alternative 2	Sensitivity Analysis 2A	Sensitivity Analysis 2B
Congested VKT	45,650	49,750	60,650
% Congested	20%	22%	27%
Congested VHT	2,000	2,150	3,050
% Congested	32%	34%	44%

7.3 Recommendation

Based upon the preceding analyses, **Alternative Network 2 - Enhanced Network** is recommended to be carried forward as the preferred Transportation Master Plan alternative as it minimizes overall network congestion and delay to support the planned growth, addressing the Problem and Opportunity Statement.

It is further noted that the growth within the NVNCTMP study area needs to be supported by 2031, by the planned York Region Transportation Master Plan improvements. The removal of improvements within and surrounding the NVNCTMP study area will have significant negative impacts on overall mobility and growth of the study area. The recommended network is illustrated in **Exhibit 7-6**.

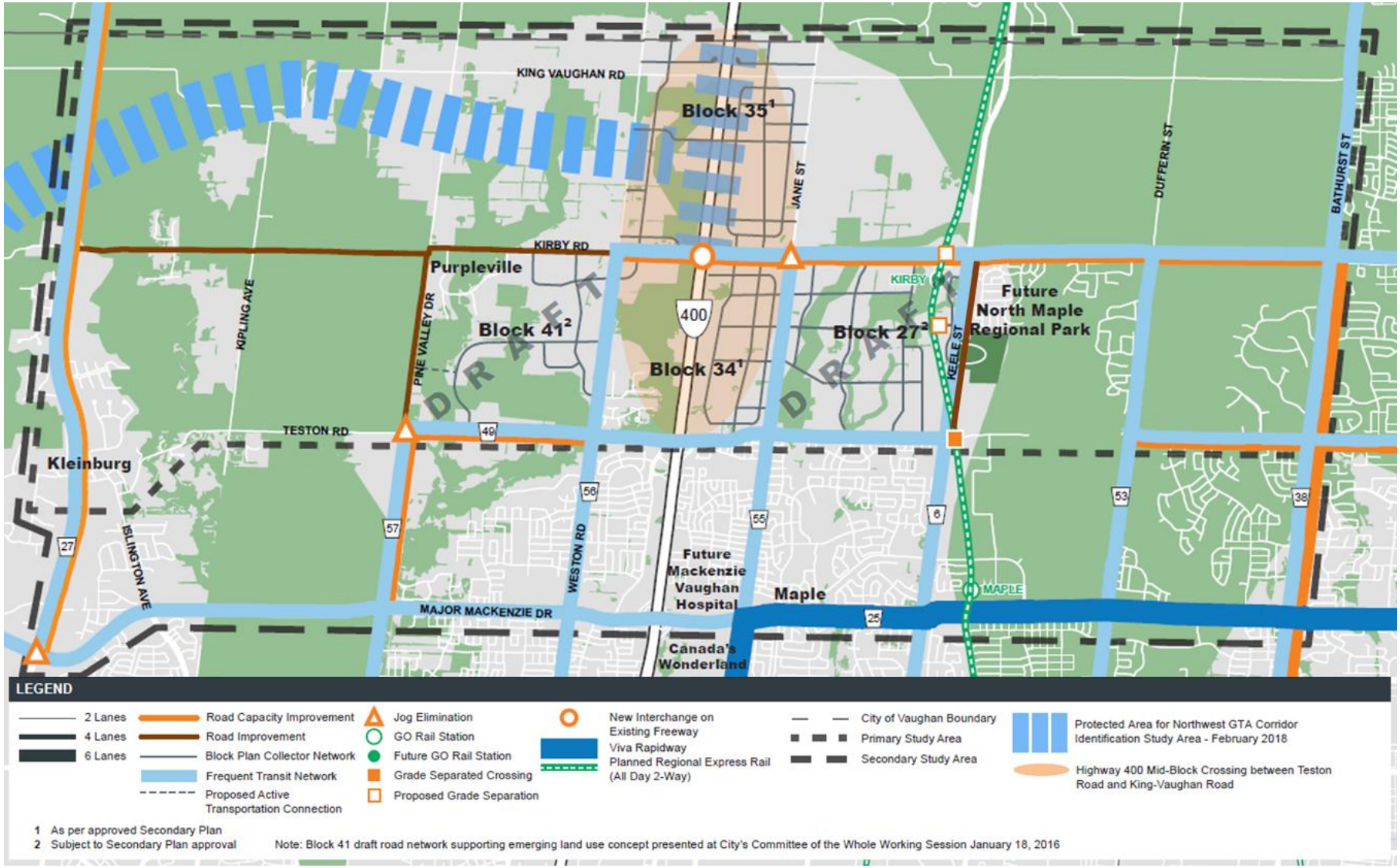

Exhibit 7-6: Recommended Transportation Network

8 Recommended Transportation Network

In the following sections, various elements of the transportation network are discussed and analyzed to provide further clarity on the recommendations. The elements identified for further discussion can be further grouped as:

- Road Improvements
- Transit Improvements
- Kirby GO Station
- Active Transportation Improvements
- TDM Recommendations

8.1 Recommended Road Improvements

The preferred alternative, Alternative 2 incorporates a well-connected transportation network with elements under provincial and York Region jurisdiction.

The following sections identify each project required to support the planned growth, with note that the NVNCTMP builds upon previous studies including the 2013 Vaughan TMP and 2016 York Region TMP which address the requirements of Phases 1 and 2 of the Municipal Class EA process for projects identified in those respective studies.

8.1.1 Provincial Highway Improvements

Provincial Highway improvements are critical to support planned growth within the Study Area. This includes the planned widening of Highway 400 from Major Mackenzie Drive to King Road from 6 lanes to 8 lanes, including new high occupancy vehicle (HOV) lanes. This widening is identified in MTO's 2017-2021 Southern Highways Program for construction completion in 2020.

Furthermore, a new Highway 400 Interchange at Kirby Road is critical to support the growth of the study area. It is recommended that the City initiate further discussion with York Region and MTO to identify a solution that is supportive of future growth and development. This may include a City-led Environmental Assessment study to identify the feasibility, need and justification for a new Highway 400 interchange at Kirby Road.

Finally, the lands potentially impacted by the Northwest GTA Corridor should be protected as directed by MTO until a decision on the corridor is made.

8.1.2 Regional Road Improvements

The Regional Road improvements identified in York Region 2016 Transportation Master Plan are critical to support the growth of the study area. The key improvements include:

- Widening from 2 to 4 lanes on Weston Road and Jane Street up to Kirby Road
- Widening from 2 to 4 lanes on Highway 27 through the study area
- Widening from 2 to 4 lanes of Pine Valley Drive north to Teston Road
- At least one Highway 400 midblock crossing between King-Vaughan Road and Teston Road (see **Section 8.1.3.5**).

A comprehensive summary of Regional Road improvements within the NVNCTMP study area is provided in **Exhibit 7-3**. It is recommended that the City continue to advocate for these critical Regional improvements that will support the growth and development of the study area.

8.1.3 City Road Improvements

Road improvements under the City's jurisdiction include:

1. Widening of Kirby Road from two to four lanes from Weston Road to Dufferin Street,
2. Construction of the "missing link" of Kirby Road between Dufferin Street and Bathurst Street
3. In the Block 27, Block 41, and the Highway 400 North Employment Lands (Blocks 34, and 35) collector road networks
4. Reconstruction of Kirby Road between Highway 27 and Weston Road; and,
5. Reconstruction of Pine Valley Drive between Kirby Road and Teston Road.

The need and justification for each City improvement is discussed below and supplemented by project sheets documenting how each project met Phase 1 and Phase 2 of the Municipal Class Environmental Assessment (EA) process. The project sheets can be found in **Appendix F - Satisfying EA Requirements**. It is noted that while the TMP supports the need and justification for projects from a network planning perspective, further work may be required during the EA process.

8.1.3.1 KIRBY ROAD IMPROVEMENTS, WESTON ROAD TO BATHURST STREET

Kirby Road is currently under City of Vaughan jurisdiction with an existing right-of-way of 21m (varies along the corridor). The need for Kirby Road improvement was assessed and recommended in both the Vaughan Transportation Master Plan and the York Region Transportation Master Plan which include widening to 4 lanes and completion of the "missing link" between Dufferin Street and Bathurst Street at 4 lanes. Kirby Road will have a regional function as development occurs. It is anticipated and recommended to be transferred to Regional jurisdiction, requiring a ROW of 36 m to function as a 4-lane arterial road in the future.

Due to regional connectivity and traffic capacity need, as well as the benefits to local development and the future Kirby GO station, the following improvements are recommended:

1. Kirby Road from Weston Road to Jane Street: Widening from 2 to 4 lanes to a 36m right-of-way width. The timing of this improvement is dependent firstly on a Kirby Road interchange at Highway 400, and both of these improvements are dependent on the outcome of the Northwest GTA Corridor Identification Study.
2. Kirby Road from Jane Street to Keele Street: Widening from 2 to 4 lanes to a 36m right-of-way width. The timing of this improvement is dependent on development in Block 27, the Kirby GO Station, and Metrolinx implementation of all-day two-way GO rail service on the Barrie Rail Corridor, anticipated by the year 2026. This increase in train service will trigger the need for grade separation of Kirby Road, and it is recommended prior to the opening of the rail line to widen the roadway and construct the grade separation.
3. Kirby Road from Keele Street to Bathurst Street: Widening from 2 to 4 lanes to a 36m right-of-way width between Keele Street to Dufferin Street is needed with the completion

of the Kirby Road Extension from Dufferin Street to Bathurst Street. At the time of this study, Kirby Road Extesion Environmental Assessment Study is undertaken by Rizmi Holdings Limited, authorized by the City, subject to principles and conditions set out in the City's Council Report adopted on December 15, 2015. It is anticipated that Kirby Road Extension will be in place before the opening of Kirby GO station (2026);thus it is recommended that Kirby Road section between Keele Street to Dufferin Street section be widened following the completion of the Kirby Road Extension.

8.1.3.2 BLOCK 27 COLLECTOR ROAD NETWORK

As identified in the Block 27 Secondary Plan, a multi-modal transportation network of streets is recommended to provide strong connections for the surrounding area and the Kirby GO station. It also encourages and support intensification and growth of the block, to provide multiple options for accessing the Regional Road network, to allow for potential future transit services, and to maximize pedestrian and cyclist safety. The street network in Block 27 will serve as the framework in order to build on other modes of transportation including walking, cycling and transit. The VOP 2010 requires that "… New development shall be planned to support a grid-like street network with multiple connections to collector and arterial streets" (policy 4.2.1.5, VOP 2010). Furthermore, policy 4.2.1.23 states that "… a minimum of 2 north/south and 2 east/west collector streets in new development where feasible, including grade-separated crossings of 400-series highways and rail corridors. The purpose of these streets will be to provide for local travel between and within concessions blocks without the necessity of traveling on arterial streets and to provide effective routing for transit vehicles." In keeping with these VOP 2010 policies, the NVNCTMP identified a hierarchy of the well-connected grid network of collector road system. This includes the designation of Major Collector Roads with 26m right-of-way width and 14m paved surface for Street 2, Street 5, and Street 8.

Street 2 is the only east-west collector road connecting Jane Street to Keele Street through Block 27 and thus should be protected for 4 travel lanes with grade separation at GO rail line. Street 2 is the only feasible continuous east-west roadway within Block 27 due to the railway constraint, its proximity to Keele Street, and need for grade separation per Metrolinx Level Crossings Policy that no new level crossings should be created on its corridors.

Street 5 is one of two continuous north-south collector roads and provides direct connectivity to the existing community south of Teston Road via Cranston Park Drive. Projected travel demand approaches the theoretical capacity for a collector road and it is recommended that this street be protected for 4 travel lanes to match the cross-section of Cranston Park Drive. As detailed in **Appendix A**, it is recommended also to align Street 5 with existing signalized intersection at Cranston Park Drive with designs that take into consideration the presence of a watercourse on the north side of Teston Road. The needs on Street 5 are further emphasized since the other north-south collector road, Street 6, requires a significant crossing through wooded areas and that connection is subject to further study. Street 5 will operate with 2-travel lanes with accommodation for on-street parking and cycling facilities. When the ultimate development is built and traffic demand prompts for additional travel lane, Street 5 may eliminate on-street parking for additional travel lanes.

Street 8 provides connectivity through Block 27 between the future Kirby GO station and the North Maple Regional Park. Given higher density land uses surrounding the GO station it is recommended to protect for 4 lanes on Street 8 with consideration for potential transit vehicles as well connecting to the GO station.

The remaining streets identified in the Draft Block 27 plan are minor collector roads with a right-of-way width of 24m.

Finally it is noted that intersection controls in Block 27 to be determined at the Site Plan approval stage, however it is anticipated that a new signalized intersection should be considered at Vista Gate and Keele Street, subject to the outcome of Metrolinx's ongoing station design.

8.1.3.3 BLOCK 41 COLLECTOR ROAD NETWORK

The Draft Block 41 Secondary Plan identifies a collector road network that provides connections to the Regional Road system with considerations of major natural and built features and existing neighbourhoods. This includes major watercourse and Natural Heritage Network corridors, the TransCanada Pipeline transformer station in the centre of the block, and finally existing estate homes in the northwest quadrant. Because of the anticipated environmental impacts, there is no vehicular connectivity to Pine Valley Drive identified in the plan but pedestrian and cycling connection is recommended to encourage active transportation and access to transit services on major arterial roads. Future studies would be required should future conditions warrants for a vehicular connection to Pine Valley Drive, particularly with respect to the outcome of the Northwest GTA study. Given the anticipated levels of development in Block 41, the collector road system in Block 41 is sufficient as minor collector roads with a right-of-way width of 24m.

With respect to intersection controls in Block 41, these should be determined at the Site Plan approval stage.

8.1.3.4 HIGHWAY 400 NORTH EMPLOYMENT LANDS COLLECTOR ROAD NETWORK

The collector road network in the Highway 400 North employment Lands was developed and confirmed through the approved Secondary Plan and incorporated into the City's Official Plan. The findings of this NVNCTMP indicate that the north-south collector road, east of Highway 400 from Kirby Road to Teston Road requires 4 travel lanes and thus should be protected for a Major Collector road at 26m right-of-way width and 14m paved surface. The other roads within Blocks 34 and 35 are minor collector roads.

As noted in the Regional Road recommendations (**Section 8.1.2**), at least one midblock crossing of Highway 400 is recommended to support the growth of the New Communities and the Highway 400 North Employment Lands. Furthermore, the development within Block 35 is subject to the outcome of the Northwest GTA Corridor Identification Study.

Pending on the study outcome and recommendation from Northwest GTA corridor, it is recommended that the City work with York Region, Ministry of Transportation and key stakeholders to identify a preferred solution for this midblock crossing.

8.1.3.5 LOCATION OF MIDBLOCK CROSSING SENSITIVITY ANALYSIS

The Enhanced Network (**Section 7.2**) recommends at least one midblock crossing between Teston Road and King-Vaughan Road across Highway 400. Three midblock crossing locations for the Enhanced Network were analyzed:

1. Block 34 midblock crossing
2. Block 35 midblock crossing
3. Block 34 and Block 35 midblock crossings

These alternatives were evaluated based on delay in the Study Area. **Table 8-1** illustrates the percentage of VKT and VHT that is congested for each alternative. It is clear that two midblock crossings would minimize delay; however there is very little difference between the alternatives. A midblock crossing in Block 34 offers minimal improvements over a midblock crossing in Block 35, however there are several challenges for Block 34 due to an existing service station on the west side of Highway 400, south of Kirby Road and due to the TCPL. As a result, the Block 35 Secondary Plan included a midblock crossing instead of Block 34.

Table 8-1: Study Area Delay of Midblock Crossings

Arterial + Local Roads	Two Midblock Crossings	Block 34 Only	Block 35 Only
Congested VKT	45,650	48,150	49,550
% Congested	20%	21%	21%
Congested VHT	2,000	2,050	2,150
% Congested	32%	33%	34%

Based on the analysis, it is recommended that at least two midblock crossings be planned and protected for between Teston Road and King-Vaughan Road across Highway 400, subject to the outcome of the Northwest GTA Corridor Identification Study and subsequent further planning studies. It is also to be noted the road network shown is subject to refinement through the block plan and project specific EA processes, as appropriate.

8.1.3.6 KIRBY ROAD RECONSTRUCTION, HIGHWAY 27 TO WESTON ROAD

With increased growth and development in the study area, it is recommended to reconstruct Kirby Road to a Regional 2-lane rural standard from Highway 27 to Weston Road to ensure safe infrastructure to accommodate growth in the area. Kirby Road from Highway 27 to Bathurst Street is also identified as one of the candidates to be added to the Regional Road Network; therefore Kirby Road should be protected for a right-of-way width of 36m. One of the objectives identified in YRTMP 2016, was “Maximize the Potential of Employment Areas” and designating a strategic goods movement network is an initiative in support of this objective. As such, while traffic capacity analysis does not indicate a need for 4 travel lanes, Kirby Road as part of the Strategic Goods Movement Network identified in the YRTMP 2016 and going through the designated Highway 400 North Employment Lands the reconstruction, protection of right-of-way width and the elimination of the jogged intersection of Kirby Road at Pine Valley Drive is recommended to facilitate and support this Regional objective

8.1.3.7 PINE VALLEY DRIVE RECONSTRUCTION, KIRBY ROAD TO TESTON ROAD

Growth within the study area will result in increased usage of Pine Valley Drive, between Kirby Road and Teston Road. This will support traffic growth on Kirby using Pine Valley Drive to access Block 41, 40/47, and other existing communities to the south.

8.1.4 Road Jurisdiction Review

With the growth of the new communities and employment lands within the NVNCTMP study area, a review of road jurisdiction based upon York Region's Regional Road Assumption policy is documented within this section.

Two roadways within the north Vaughan study area which have been identified as candidates to be transferred to the Region's jurisdiction in the YRTMP 2016 include Kirby Road from Highway 27 to Bathurst Street, and Pine Valley Drive, north of Teston Road. Based on the findings of the analysis, it is recommended that both roadways as described above be uploaded to York Region and Schedule 9 of VOP 2010 be amended to have these roadways classified as "Major Arterial (Regional)", while further discussion with York Region is required for Pine Valley Drive from the northern City limits to Teston Road. Details supporting these recommendations are provided in the following sections.

8.1.4.1 KIRBY ROAD ANALYSIS

Kirby Road today is designated as a minor arterial road in the VOP 2010. The role and function of Kirby Road through the study area will change significantly with the development of the New Communities and Highway 400 North Employment Lands. **Table 8-2** summarizes firstly the 2011 and 2031 traffic volumes using Kirby Road through the study area and secondly the origin-destination patterns internal to Vaughan, external to internal and vice versa, or a through trip. While it is apparent that Kirby Road handles primarily longer distance traffic today with 46% through-trips and 44% external trips, the total internal users of the roadway grow significantly from just over 100 to over 1,000.

Table 8-2: Kirby Road Select Link Origin-Destination Patterns

Kirby Road Select Link	2011 Trips	2011 %	2031 Trips	2031 %
Origin and Destination in Vaughan	128	11%	1,126	37%
Origin or Destination in Vaughan	521	44%	1,671	55%
No Origin or Destination in Vaughan	548	46%	248	8%
Total	1,198	100%	3,046	100%

The select link analysis illustrates how traffic patterns change with the growth of the New Communities. Where through traffic in 2011 was 46%, by 2031 through traffic decreases to only 8%. It is evident that roadway capacity and usage will be directed towards the growth areas within the Study Area.

A review of the Kirby Road Corridor between Highway 27 and Dufferin Street was completed in relation to the Region's "Regional Road Assumption Policy Update", adopted October 17, 2013. This review is provided in **Table 8-3** to facilitate the discussions with York Region about this potential shift to Regional jurisdiction.

Table 8-3: Regional Road Assumption Policy Criteria

Item #	Criteria (Rural)	Meets criteria?
1	Connects designated rural settlements having existing major commercial / industrial development of more than 150 persons to each other and a Regional Road or Provincial Highway	Yes – connects Highway 27, Weston Road, Jane Street, Keele Street and Dufferin Street. In the future with a Kirby Road interchange it will connect to Highway 400.
2	Connects a Provincial Highway or Regional Road to: a. Provincial Highway b. Major commercial or industrial areas c. Major institutional complexes such as colleges and hospital	Yes – In the future will connect Highway 400 to major employment lands between Weston Road and Jane Street
3	Provides service close to consistent major attractors or generators of heavy vehicles	Yes – York Region's TMP 2016 identifies Kirby Road as a strategic goods movement corridor
4	Provides service parallel to and, where justified, crossing major barriers to free traffic movement	Yes – crosses Highway 400 and the Barrie GO Rail line
5	Provides service on those roads which are extensions of roads designated as Regional roads in urban areas and to a Regional road or Provincial Highway	Yes – with the missing link in place, Kirby would be an extension of RR29 Gamble Road/19th Avenue
6	Provides service on those roads which are extensions of roads designated as Regional or County Roads in neighbouring jurisdictions and to a Regional road or a Provincial Highway	No – Kirby Road nor its extensions (Gamble/19th) extend into a neighbouring jurisdiction as a Regional Road
7	Roads should have a current traffic volume greater than 4,000 AADT	Yes – current traffic volume is around 5,000 AADT. In the future traffic should exceed 12,000 to 15,000 AADT.
8	Roads should be part of the original concession road grid	Yes

Further to the above criteria, the Region's 2016 TMP identifies the widening of Kirby Road from Pine Valley Drive to Dufferin Street and the construction of the missing link between Dufferin Street and Bathurst Street. Transfer to York Region would provide the Region with full control over the Environmental Assessment process for improvements to the roadway. In addition, the TMP identifies Kirby as a Strategic Goods Movement Corridor. Based on the above analysis, ***it is recommended that Kirby Road from Highway 27 to Bathurst Street be transferred to York Region.***

The transfer of Kirby Road from Highway 27 to Dufferin Street has been endorsed by City Council and a request was sent to York Region in June 2012.

8.1.4.2 PINE VALLEY DRIVE ANALYSIS

Pine Valley Drive travel patterns are similar to Kirby Road's in that today, the lack of development adjacent to the roadway means that it is used primarily by long-distance commuter trips. Pine Valley Drive origin-destination patterns are summarized in **Table 8-4**. By 2031, Pine Valley Drive serves traffic from adjacent development lands, in this case Block 41, 40 and 47, 34 and 35, and the through traffic percentage decreases from 56% in 2011 to 24%.

Table 8-4: Pine Valley Drive Select Link Origin-Destination Patterns

Pine Valley Drive Select Link	2011 Trips	2011 %	2031 Trips	2031 %
Origin and Destination in Vaughan	54	7%	270	23%
Origin or Destination in Vaughan	272	37%	612	52%
No Origin or Destination in Vaughan	410	56%	285	24%
Total	736	100%	1167	100%

Further, a review of the Pine Valley Drive corridor north of Teston Road up to the northern study boundary was completed in relation to the Region's "Regional Road Assumption Policy Update", adopted October 17, 2013. This review is provided in **Table 8-5** to facilitate the discussions with York Region about this potential shift to Regional jurisdiction.

Table 8-5: Regional Road Assumption Policy Criteria

Item #	Criteria (Rural)	Meets criteria?
1	Connects designated rural settlements having existing major commercial / industrial development of more than 150 persons to each other and a Regional Road or Provincial Highway	No
2	Connects a Provincial Highway or Regional Road to: a. Provincial Highway b. Major commercial or industrial areas c. Major institutional complexes such as colleges and hospital	Yes – will connect Regional Roads (Teston and Pine Valley Drive south of Teston) to the planned major employment Area in Block 34 and 35.
3	Provides service close to consistent major attractors or generators of heavy vehicles	Yes – will provide access to Vaughan Highway 400 North Employment Lands
4	Provides service parallel to and, where justified, crossing major barriers to free traffic movement	Yes – provides service parallel to Highway 400 and Weston Road and will support planned development
5	Provides service on those roads which are extensions of roads designated as Regional roads in urban areas and to a Regional road or Provincial Highway	Yes – Pine Valley Drive is a Regional Road south of Teston Road
6	Provides service on those roads which are extensions of roads designated as Regional or County Roads in neighbouring jurisdictions and to a Regional road or a Provincial Highway	No – discontinuous north of the King-Vaughan boundary
7	Roads should have a current traffic volume greater than 4,000 AADT	No – current AADT is about 2,000 north of Teston Road. However in the future it will exceed 10,000.
8	Roads should be part of the original concession road grid	Yes

Further to the above criteria, the Region's TMP 2016 identifies the widening of Pine Valley Drive to 4 lanes between Teston Road and King-Vaughan Road by 2041. Transfer to York Region would provide the Region with full control over the Environmental Assessment process for improvements to the roadway. The transfer of Pine Valley Drive from King-Vaughan Road to Teston Road has been endorsed by City Council and a request was sent to York Region in June 2012.

Because 5 out of 8 criteria in **Table 8-5** are met***, it is recommended that Pine Valley Drive from King Vaughan Road to Teston Road be transferred to York Region***.

8.2 Transit Improvements

8.2.1 Metrolinx Improvements

Metrolinx's 2041 Regional Transportation Plan identifies all-day two-way rail service every 15 minutes on the Barrie Rail Corridor by 2025. In addition, the Kirby GO Station was identified as a new station approved by the Metrolinx Board in June 2016. These plans have significant positive impact on the mobility of the study area and particularly Block 27. It is recommended that the City continue to advocate and support these improvements in order to best serve development in the study area.

8.2.2 Regional Transit Improvements

Similar to roadways, Regional Transit improvements identified in York Region 2016 Transportation Master Plan are critical to support the growth of the study area. This includes primarily Frequent Transit Network service on all Regional arterials in the study area including Kirby Road, Teston Road, and all north-south streets in the study area up to Kirby Road, with the exception of Kipling Avenue. The Regional Frequent Transit Network is illustrated in **Exhibit 7-3.** Further to that the planned Viva Silver Rapidway on Jane Street and Major Mackenzie Drive would provide quick, reliable transit service to the Vaughan Metropolitan Centre Subway via Jane Street, and to Richmond Hill via Major Mackenzie Drive. These regional services are important to serve future populations in the study area.

8.3 Kirby GO Station

8.3.1 Preliminary Conceptual Station and Land Use Plan

In early 2016, the City initiated the Kirby GO Transit Hub Sub-Study as an extension of the Block 27 Secondary Plan. The purpose of the Kirby GO Transit Hub Sub-Study was to develop a vision, based on a robust planning rationale, which will direct future development of the transit hub and integration with the rest of Block 27 and surrounding areas. The City of Vaughan, York Region and Metrolinx have worked together collaboratively to complete the Hub Sub-Study.

As part of this study, in support of the Hub Sub-Study, transportation infrastructure requirements were identified including Kirby Road grade separation requirements and associated road access requirements.

The Kirby GO Transit Hub Sub-Study provides a summary of the site context, policy and guideline framework, and key directions that were used to inform the concept plan for the future Kirby GO Transit Hub area. The Hub Sub-Study report includes a demonstration plan for the Kirby GO Station and will discuss the implementation strategies necessary for its completion. The demonstration plan illustrates how the ultimate build-out of the GO station and surrounding area could look like taking into consideration planning policies, future transit-oriented development, provincially mandated density requirement, environmental constraints and infrastructure needs.

Key elements of the demonstration plan include:

- Grade separation of Kirby Road at the Barrie GO Rail line
- Supporting street system
- Off-road trail system
- Surface parking requirements
- Public spaces
- Development potential
- Preliminary recommendations on intersections at major arterial roads

It is noted that the Hub Sub-Study and supporting work from this NVNCTMP study are also conducted to ensure sufficient land is protected for station facilities and infrastructure needs, such as grade-separation right of way protection, road right of way protection, storm water management ponds locations protection, and public space protection. This information is used as input as Metrolinx plans and designs the station concept. Please see **Appendix E - Kirby Road Grade Separation Timing and Requirements** for additional information on the development of the transportation network and analysis supporting the development of the Kirby GO concept plan and transportation system, include grade separation warrant analysis, conceptual plan and profile drawings, and recommendations on phasing and implementation.

This analysis resulted in the following recommendations:

- Build the Kirby Road grade separation by 2026 prior to all day two-way service implementation on the Barrie GO corridor,
- Advance construction of the grade separation prior to or in parallel with the construction of the Kirby GO station and integrate the Kirby Road grade separation EA into the Transit Project Assessment Process if possible,
- Preliminarily feasibility analysis supports a “jughandle” system to provide vehicular access to lands between the rail line and Keele Street, due to insufficient space for a signalized intersection with Kirby Road. It is recommended this configuration be considered as one of the design alternatives in the Kirby Road grade separation EA study; and that, the provision of direct walking and cycling infrastructure between Kirby Road and the future GO station be addressed.

The Kirby GO station provides an opportunity to connect the station directly to the active transportation network and create a multi-modal mobility hub. The new station should be developed following the Metrolinx mobility hub guidelines, which emphasize seamless integration with other modes with a particular focus on pedestrian connectivity and parking management, a mixed-use environment, and an attractive public realm and station experience, all of which has been identified in the Kirby GO Transit Hub Sub-Study and its demonstration plan.

In December 2016, Metrolinx published the GO Rail Station Access Plan (Station Access Plan) Final Report with the vision to provide station access in an “integrated, sustainable, and financially efficient manner to grow ridership, enhance all customers’ experience and safety, and reduce the dependency on single-occupant vehicles.” Figure 12 of the Station Access Plan

presents the Kirby GO Station as a proposed station forecasted to have an average daily ridership of 4,001-8,000 by 2031.

8.3.2 Metrolinx GO Rail Station Access Plan Recommendations

Target station access mode shares by 2031 are identified along with key recommendations pertaining to each mode. Metrolinx's recommendations for Kirby GO station and the Barrie GO Line are outlined in Appendix B of the GO Rail Station Access Plan (2016) and are summarized in **Table 8-6**. The Kirby GO Transit Hub Sub-study concept plan, provided as input to Metrolinx's ongoing work, is consistent and supportive of the Station Access Plan.

Table 8-6: Metrolinx Station Access Plan (2016), Kirby GO Station Recommendations

Travel Mode	Target Mode Share	Recommendations	City of Vaughan Response
Walking	12-14%	• Permeable local street network with sidewalks on both sides of GO rail corridor • Separated pedestrian and cycling connection along east-west entrance road connecting to Keele St. at Vista Gate • Develop high intensity residential and mixed use development within walking distance – including an "urban transit village" on the east side of the station	The Kirby GO Transit Hub Sub-study recommendations are consistent
Cycling	3-4%	• Incorporate separated or dedicated cycling paths and trails providing direct connections to station entrances adjacent to both sides of the rail corridor • Incorporate bike shelters at station entrances on both sides of rail corridor • Incorporate secure bike parking at primary entrance on east side • Expedite cycling infrastructure along regional roads	The Kirby GO Transit Hub Sub-study recommendations are consistent
Local Transit / Micro-Transit	18-20%	• Develop on-street multi-bay bus facility along primary access road into the GO station • Extend YRT routes 81 and/or 22 to Kirby GO when future rail service is intiated • Ensure connecting local transit service is 15/20 minute frequency during peak/off-peak periods • Work with YRT to identify new local routes west of Kirby GO	• The Kirby GO Transit Hub Sub-study currently identifies a traditional bus loop. The City agrees with the vision of a more urban facility. • Work with YRT also to identify gaps in existing service
Pickup / drop off	26-28%	• Pick-up drop-off facility is located on the west side of the station • Urban pick-up drop-off facility on the east side of the station	The Kirby GO Transit Hub Sub-study recommendations are consistent

Travel Mode	Target Mode Share	Recommendations	City of Vaughan Response
Drive and Park	40-42%	• Provide 1,000 parking spaces distributed on both sides of corridor • Implement modified reserve parking program on the east side of the corridor (~450 spaces) • Over the long term - support intensification on the east side replacing surface parking. • Offset lost parking spaces with shared parking. • Explore feasibility of modular parking on the west side	• Further study / monitoring as development occurs is recommended to confirm the 1,000 surface parking requirement • A real-time, system-wide smart parking system integrated with mobile technology may reduce drive and park needs at specific stations
Carpool	5-6%		

Source: Metrolinx Station Access Plan (2016), Appendix B, P.145-147

8.3.3 Micro-Transit

Micro-transit is identified by Metrolinx as a future consideration for transit access. With the development of Block 27 and the Kirby GO station, the City should seek out opportunities to facilitate and encourage these services to provide more mobility options to travellers.

A prime example of such an opportunity includes the Town of Milton's year-long funded pilot project in collaboration with Metrolinx.

The Milton GO Connect pilot replaced a fixed-schedule evening drop off shuttle service operated by Milton Transit since 2010 for the duration of the pilot. Passengers used the RideCo app to book trips to/from the Milton GO Station during the morning and evening peak periods. The service was operated through a partnership between Milton Transit and "Ride-Co" who provided an app and dynamic routing algorithm which dispatched vehicles from a local taxi company. The pilot fares differed based on choice of pick-up/drop-off location: 1) $1.95 for pick-up/drop-off at the rider's specified address or 2) $1.45 for pick-up/drop-off at a nearby hub.

Results showed that demand response shuttles and similar new mobility solutions can be competitive for mid-length trips (2-4 km) where transit coverage or frequency is limited and for longer trips (5-7 km). In the U.S. both Uber and Lyft are starting to collaborate with transit agencies on providing first and last mile on-demand service, including shared ride services, such as UberPool and Lyft Line.

There are also opportunities to fund the initiative as Metrolinx provided $140,000 to the Town of Milton to fund the one-year pilot of on-demand transit service serving the Milton GO station. There are opportunities to explore private partnerships with businesses and rideshare companies.

In addition to Kirby GO Station, opportunities for micro-transit should also be considered through future further study so support other GO stations within and in the vicinity of the study area including Maple GO and Rutherford GO.

8.3.4 Wayfinding and Active Transportation

The provision of signage or wayfinding at the GO station and in the surrounding areas is essential to direct potential customers to the GO station, particularly via active transportation.

Wayfinding measures supporting the Kirby GO Station should include:

- Signage integrated with the local trails and multi-use path system which should connect to stations.
- Streets and public spaces within 2km of the station should have signage to encourage community members to walk to the station.
- Designated cycling routes, such as along the planned Vaughan Super Trail (TCPL Trail) should include wayfinding signage within 5km of the Kirby GO Station.
- Ensure public realm includes proper lighting, amenities, and other design elements to encourage walking or biking to stations.
- Special designs or branding such as “GO Active community” or “Kirby GO Transit Village” should be incorporated in partnership with local and regional partners to promote community awareness to active mode of access to stations.
- Consider utilizing emerging multimodal, real-time wayfinding technologies such as *TransitScreen* at the Kirby GO Station and at key locations throughout the surrounding community and Block 27 (EcoMobility Hubs – see **Section 8.3.5**)

8.3.5 EcoMobility Hub Plan

Building upon the York Region TMP policy recommendation to “provide opportunities for residents to park their vehicles on the fringes of urban areas and access different methods of travel for part of their trips, including transit or car sharing”, the City can leverage emerging technologies to improve transportation efficiency through the concept of the EcoMobility Hub[3]. This concept is a one-stop service point for multi-modal mobility systems which is currently implemented in various cities in Germany and the Netherlands. The EcoMobility Hub integrates transit stops or major stations with electric car charging stations with car-share parking, comfortable and safe waiting areas for ride-sharing, and bike-sharing. Illustrations of different types of EcoMobility hubs are provided in **Exhibit 8-1** (larger scale Transit Interchange), **Exhibit 8-2** (on-street car share station), and **Exhibit 8-3** (integrated bike share and bus stop).

Block 27 is an ideal location to pilot the program as a transit oriented community surrounding the Kirby GO Station and the Block is also immediately west of the future North Maple Regional Park. A conceptual plan for EcoMobility hub locations is presented in **Exhibit 8-4** which identifies potential locations within Block 27, including the Kirby GO station, the community hub, the North Maple Regional Park (east side of Keele Street), and other key locations integrated with public squares, parks or schools. It is to be noted the Kirby GO Station and EcoMobility

[3] 1. 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.
2. 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.

Hub locations shown are conceptual and subject to refinement through the secondary plan, block plan and EA Addendum processes, as appropriate.

At larger scale EcoMobility hub locations, consider:

- Promote multi-modal trip planning apps that also take into account bike, carpool or walk access to stations (such as the CityMapper app)
- Consider utilizing multi-modal, real-time wayfinding technologies such as *Triplinx*
- Explore carpooling and ridesharing marketing to residents about HOV lanes to provide access to VMC and the TTC Spadina Subway extension (as suggested in the VOP 2010)

The City of Toronto is currently working with SmartCommute North Toronto Vaughan to implement EcoMobility hubs in the Consumers Road Area.

Exhibit 8-1: EcoMobility Hub – Transit Interchange
Source: multi mobility, Sophia von Berg, 2014

Exhibit 8-2: Switchh Mobility Hub, Hamburg, Germany – On-Street Car Share Station
Source: http://multi-mobility.tumblr.com/page/2

Exhibit 8-3: Einfach Mobil Hub, Offenburg, Germany – Integrated Bike Share / Bus Stop
Source: http://www.badische-zeitung.de/offenburg/einfach-mobil-in-offenburg--95313876.html

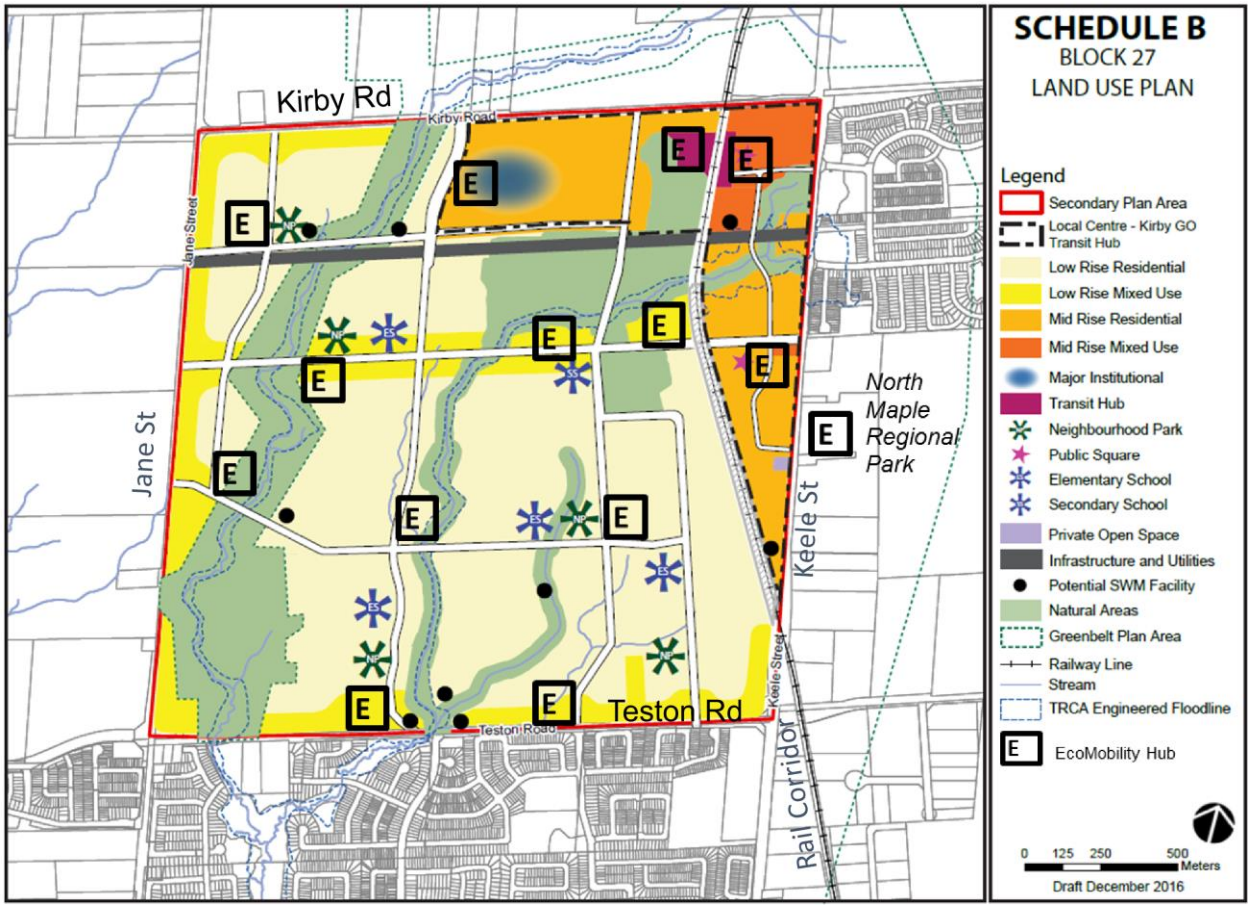

Exhibit 8-4: Block 27 EcoMobility Hub Conceptual Plan*
Source: Base map from Draft December 2016 Draft Land Use Plan (*Note: updated final land use Schedule for Block 27 has been adopted by City Council in June 2018)

8.3.6 Additional Opportunities

In addition to the opportunities noted in the previous section, consideration of the following opportunities can provide and promote multimodal connectivity to Kirby GO Station:

- Preferred parking spaces at Kirby GO Station for car share, zip-cars and autonomous cars.
- Consider opportunities to utilize autonomous mini-buses for shuttle service to nearby employment and local centres (to and from GO Stations).
- Bike share and EcoMobility hub network throughout Block 27

8.4 Active Transportation Improvements

8.4.1 North Vaughan Active Transportation Network

The recommended active transportation network is illustrated in **Exhibit 8-5** which illustrates a high-level on-street active transportation network plan including the Pipeline Trail (TCPL Trail). As most destinations are outside of the New Community Blocks, it is suggested to connect other off-street trails around the Blocks as well as providing cycling facilities that connects the New Community to adjacent destinations.

The recommended active transportation network encompasses three general facility types:

- **Separated Cycling Facility**: provides a physical separation between cyclists and motor vehicles and can include cycle tracks, raised bike lanes, and multi-use trails.
- **Dedicated Cycling Facility**: provides dedicated on-road space to cyclists, such as bike lanes, buffered bike lanes and paved shoulders on rural roads.
- **Shared Facility**: cyclists and motor vehicles share road space. Shared facilities are appropriate on low volume and/or low speed roads.

Intended to provide general guidance, facility types should be evaluated on a case by case basis during the facility design and implementation process using the Ontario Traffic Manual Book 18 guidance.

A detailed listing of each improvement is provided in **Table 8-7**. It is noted that the City of Vaughan 2018 Pedestrian and Bicycle Master Plan is currently being updated in parallel to this report, and that the recommendations made as part of the NVNCTMP may not reflect those identified in that study. The Vaughan Super Trail will also be introduced within the update consisting of three segments within the NVNCTMP study area, which includes TCPL Trail. These trails can be seen in **Exhibit 2-10**.

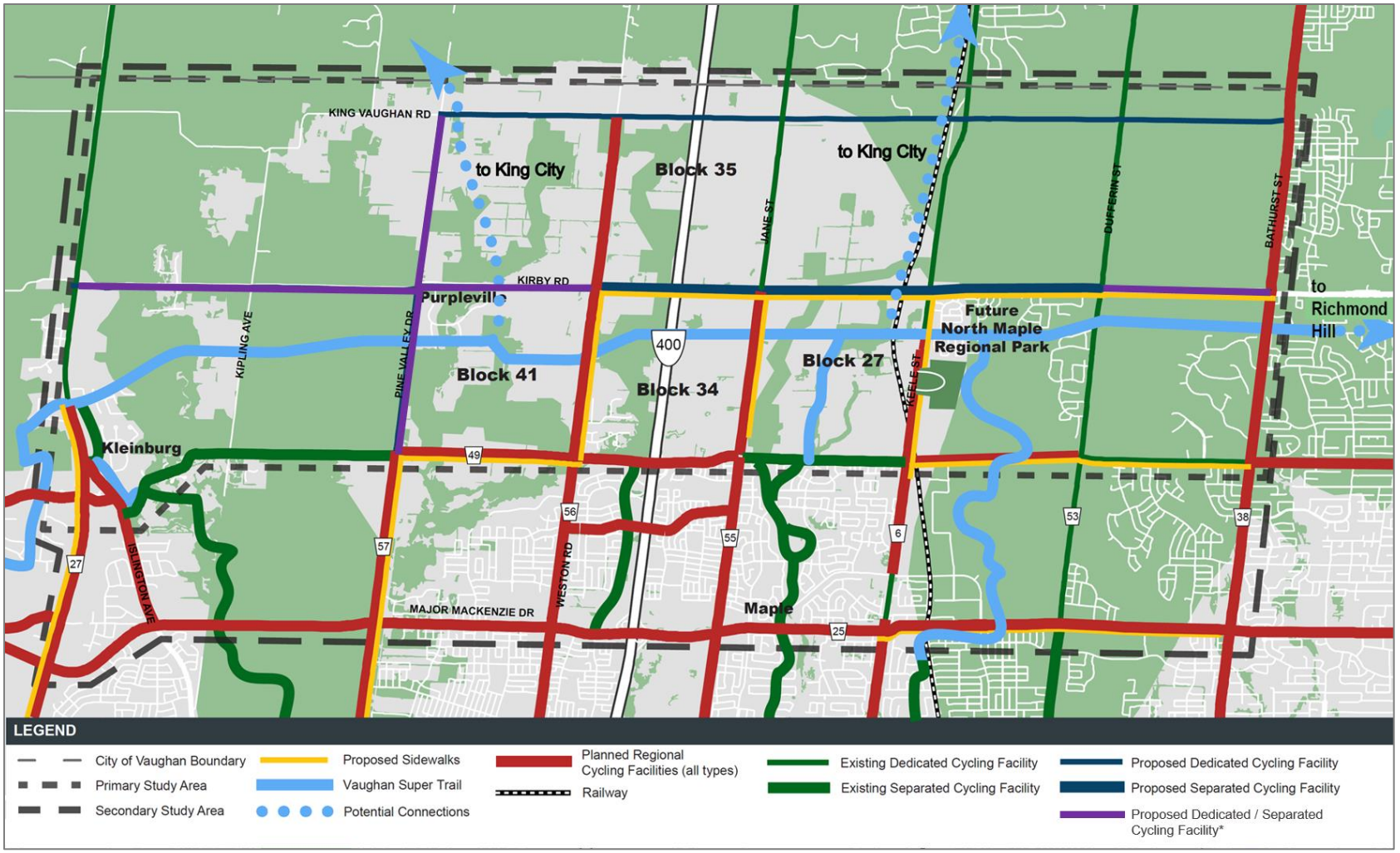

Exhibit 8-5: Recommended Active Transportation Network Improvements**

* Recommend upgrading to separated facilities upon redevelopment of the area or future improvements of the road.
**Vaughan Super Trail mapping based upon the Proposed Concept Framework, April 2017

Table 8-7: Active Transportation Network Detailed Recommendations

Road	Segment	Recommendation	Rationale
King Vaughan Rd	Pine Valley Dr – Bathurst St	Separated Facility	Upgrade from dedicated facility recommended in York Region TMP. City of Vaughan OP states that where feasible, arterial streets should be designed to accommodate separate bike lanes.
Kirby Rd	Hwy 27 – Weston Rd	Dedicated / Separated Facility*	Natural environmental features and goods movement in the area may constraint the ROW; however, cycling should still be accommodated by separated facilities.
Kirby Rd	Weston Rd – Dufferin St	Separated Facility	As an arterial road, it should be designed to accommodate separate bike lanes, especially as the corridor is identified as a Regional Strategic Goods Movement Corridor. Kirby Road will also be widened to four lanes between Weston Road and Bathurst Street.
Kirby Rd	Dufferin St – Bathurst St	Dedicated / Separated Facility*	Natural environmental features and development in the area may constrain the ROW; however, cycling should still be accommodated by separated facilities.
Teston Rd	Hwy 27 – Pine Valley Dr	Separated Facility	Per City's OP, arterial road should be designed to accommodate separate bike lanes and will feed into the Regional Network.
Teston Rd	Pine Valley Dr – Bathurst St	Separated Facility	City of Vaughan Bicycle and Pedestrian Master Plan and York Region TMP.
Pine Valley Dr	Major Mackenzie Dr – Teston Rd	Separated Facility	York Region TMP, incorporate into road widening.
Pine Valley Dr	Teston Rd – Kirby Rd	Dedicated / Separated Facility*	Natural environmental features in the area may constrain the ROW; however, cycling should still be accommodated by separated facilities.
Pine Valley Dr	Kirby Rd – King Vaughan Rd	Dedicated / Separated Facility*	Natural environmental features in the area may constrain the ROW; however, cycling should still be accommodated by separated facilities.
Weston Rd	Major Mackenzie Dr – King Vaughan Rd	Separated Facility	York Region TMP.
Jane St	Major Mackenzie Dr – Teston Rd	Separated Facility	York Region TMP.
Jane St	Teston Rd – Kirby Rd	Dedicated Facility	Upgrade from shoulder to cycle tracks with expansion to 4 lanes. Consistent with Facility Type in York Region TMP.
Keele St	Major Mackenzie Dr – Kirby Rd	Dedicated Facility	Continue dedicated facility that currently exists south to Major Mackenzie Drive. Consistent with Facility Type in York Region TMP.
Bathurst St	Major Mackenzie Dr – Kirby Rd	Separated Facility	York Region TMP, with widening of Bathurst St to 6 lanes, incorporate separated facility
TCPL Trail	Hwy 27 – east of Keele St	New Trail	Part of the Vaughan Super Trail, identified in the City of Vaughan 2018 Pedestrian and Bicycle Master Plan update
Bartley Smith Greenway Extension	Bartley Smith Greenway – TCPL Trail	New Trail	Part of the Vaughan Super Trail, identified in the City of Vaughan 2018 Pedestrian and Bicycle Master Plan update

Road	Segment	Recommendation	Rationale
Segment from McNaughton northbound through Keele Valley Lands and North Maple Regional Park	Vaughan City Hall to TCPL Trail	New Trial	Part of the Vaughan Super Trail, identified in the City of Vaughan 2018 Pedestrian and Bicycle Master Plan update

*Recommend upgrading to separated facilities upon redevelopment of the area or future improvements of the road.

8.4.2 TransCanada Pipeline Trail Design Considerations

Based on consultation with TransCanada Pipeline (TCPL), the multi-use trail proposed within TransCanada's right-of-way cannot meander across the pipeline:

- The trail must maintain a 5 m separation from the pipeline(s), and
- Crossings over the pipeline by the trail must be minimized.

In addition, crossings of Regional Roads should be protected using traffic signal. The crossings of Weston Road and Highway 400 and at Keele Street are examined in further detail in the following section. Connections across other major barriers for the TCPL trail are not addressed within this study and should be considered through a future Environmental Assessment Study for the TCPL trail.

8.4.2.1 TCPL TRAIL OPTION ACROSS WESTON ROAD AND HIGHWAY 400

With the identification of the new midblock crossing of Highway 400 through Block 34 and between Kirby Road and Teston Road, and given the proximity to the proposed TCPL trail, it may be beneficial in the design of the TCPL to utilize the midblock crossing to consolidate infrastructure requirements of crossing Highway 400. Through the Block 41 Secondary Plan, a connection from the TCPL right-of-way to the east-west collector road at Weston Road should be considered to provide this connection. In addition this will provide a protected crossing of the TCPL trail at Weston Road.

8.4.2.2 CONNECTIVITY OF TCPL TRAIL ACROSS KEELE STREET

The TCPL crossing is challenging due to an existing traffic signal only 115 m away from the TCPL right-of-way at Peak Point Boulevard. While a detour of the trail seems possible, active transportation trips tend to use the most direct routes. As such, while a detour could be built, pedestrians in particular will choose the shortest path. In many cases this may include jaywalking. An illustration of the TCPL at Keele Street is provided in **Exhibit 8-6.**

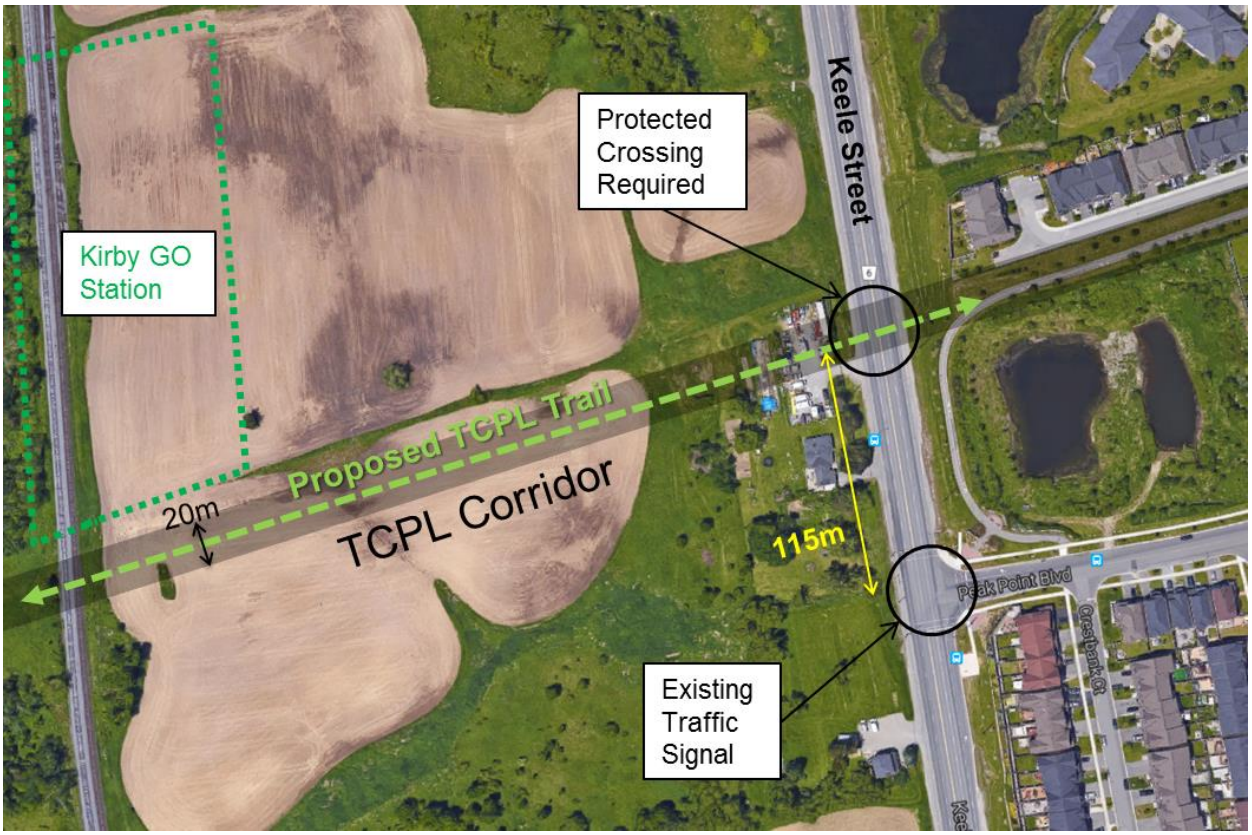

Exhibit 8-6: TCPL Trail Crossing of Keele Street

To protect the crossing, new push-button actuated traffic signals or pedestrian cross-walk signals are recommended. Although the Region's access policy identifies a 215 m minimum distance between signalized intersections on a major commuter arterial such as Keele Street, it might be possible to consider the TCPL crossing as a lesser intersection. The right-in-right-out (RIRO) policy suggests that on a commuter arterial, the minimum distance between intersections is 100 m.

8.4.3 Urbanization of Keele Street

As part of the Block 27 development, Keele Street between Teston Road and Kirby Road requires urbanization to support the development of the Block. Urbanization of the cross-section of Keele Street would include sidewalks and cycling facilities.

As there is an existing dedicated cycling facility on Keele Street north of Kirby Road, the development for Block 27 could construct a dedicated cycling facility to connect to the existing system, consistent with York Region TMP recommendations. However through further study of a Keele Street urbanization, a separated cycling facility should be considered where feasible to increase cyclist comfort and safety.

8.4.4 Block 27 Active Transportation Network

Block 27 is to the east of Highway 400. A significant barrier to cycling in this Block is the railroad. **Exhibit 8-7** illustrates the active transportation connections in the Block which include on-street cycling facility recommendations beyond those considered within the Draft Block 27

Secondary Plan which focused on the on-street connections within the internal collector road network and the off-street connections. Depending on the widths, volume and traffic on the new roadways, protected bicycle lanes should be built on the major collectors, and buffered bike lanes on minor collectors.

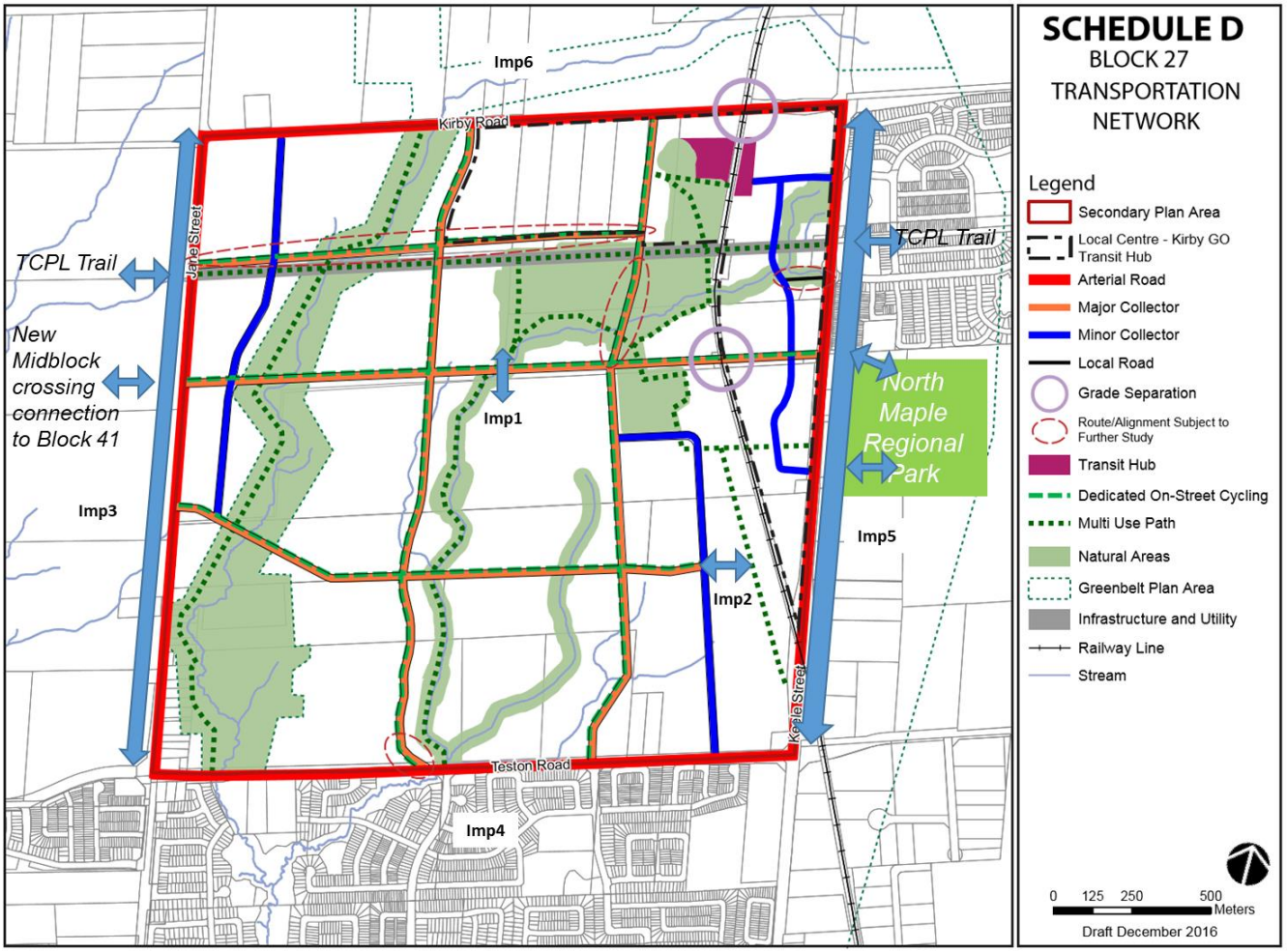

Exhibit 8-7: Block 27 Active Transportation Recommendations

Table 8-8 describes each improvement recommended in Block 27 and the supporting rationale.

Table 8-8: Block 27 Active Transportation Recommendations

Reference	Description	Rationale
Imp1	Imp1 and all other crossing points for the trail system: Crossings should be high quality as most cyclist/vehicular crashes occur at intersections.	Safety of bicyclists is most important at intersections.
Imp2	Continue bicycle connection to planned trail.	A missing link exists from the minor collector to the planned off-street route. This will improve east-west connectivity and movements.
Imp3	Consider upgrading existing shoulder on Jane Street by adding buffered bike lanes with expansion to 4 lanes.	Connects planned mixed-uses along Jane Street to existing development south of Teston Road.
Imp4	Teston Road has a planned separated bike lane from the York Region Transportation Master Plan and the City of Vaughan bicycle and pedestrian plan.	Provide regional, direct travel along Teston Road. Provides east-west connection.
Imp5	Through urbanization of Keele Street, construct separated cycling facility on the west side of Keele Street to facilitate travel to the Kirby GO station.	Connects commercial and mixed use hub around planned Kirby GO station to existing residential development south of Teston Road.
Imp6	Separated cycling facility on Kirby Road.	Supports YRTMP recommendations and provides a safe cycling facility for Block 27 residents.
Imp7 (not mapped)	Conduct further study to identify recommendations for safe trail crossings across major corridors in Block 27 including arterial roads, watercourses, and rail.	

8.4.5 Block 41 Active Transportation Network

Exhibit 8-8 shows the most recent plan for development of Block 41 and proposed enhancements to the active transportation network beyond those already considered in the draft Block 41 Secondary Plan, which included on-street cycling facilities on the internal collector network and off-street cycling facilities. The most important off-road trail to connect with the wider area is the proposed “Pipeline Trail” which traverses Block 41 east-west. Crossing points along Teston Road will be important to link neighbourhoods in other blocks, especially where trails cross mid-block or where bus stops are located. **Table 8-9** describes each trail for Block 41 and the rationale.

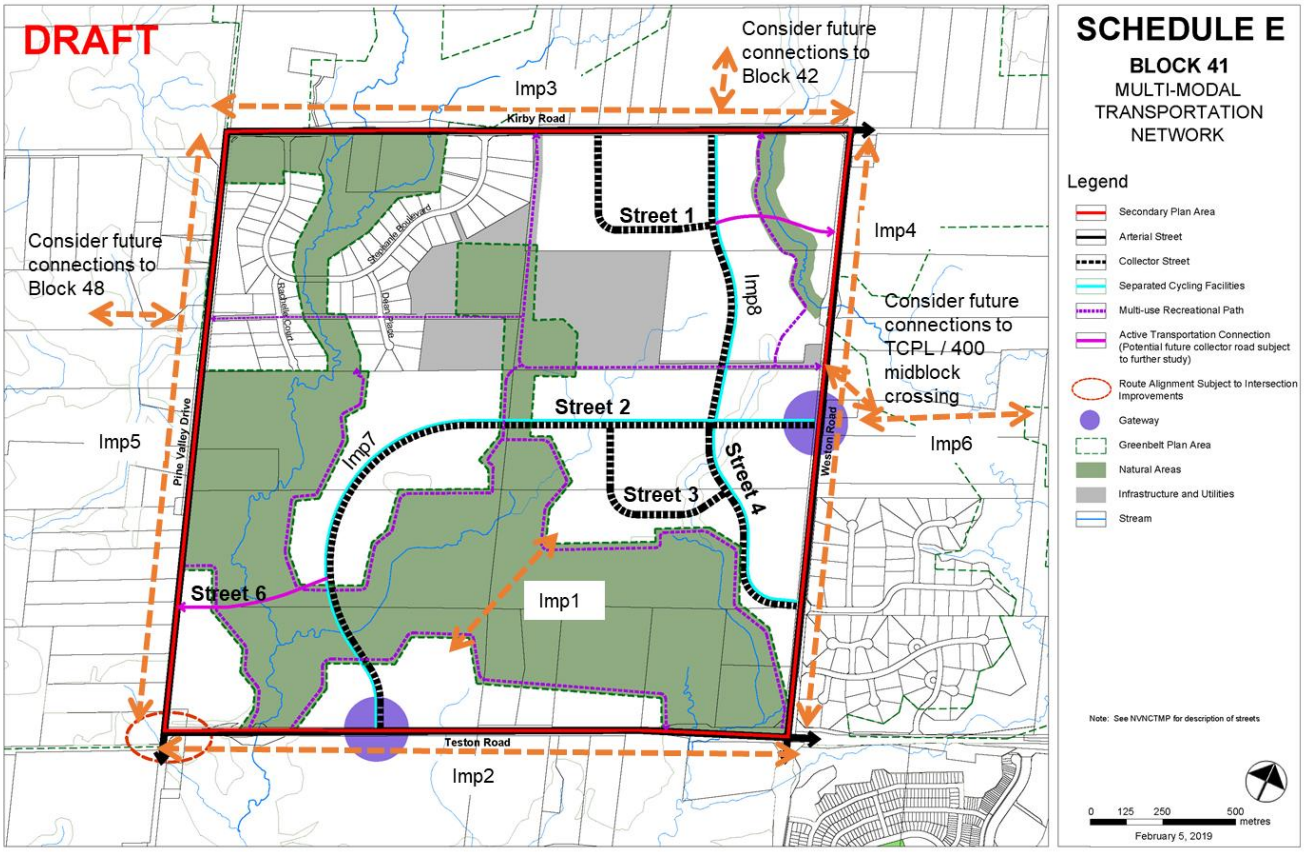

Exhibit 8-8: Block 41 Active Transportation Recommendations

Table 8-9: Block 41 Active Transportation Recommendations

Reference	Description	Rationale
Imp1	Multiuse trail connecting a residential to a multiuse area and school.	Linking destinations via the shortest path is important for cyclists and pedestrians. The current plan has no direct route between the two major activity hubs in the Block. The creation of a high quality off-street link between the two activity hubs will encourage active transportation.
Imp2	Teston Road has a planned separated bicycle facility from the York Region Transportation Master Plan, the City of Vaughan bicycle and pedestrian plan, and the Teston Road EA study.	Provide regional, direct travel along Teston Road. Provides east-west connection.
Imp3	Dedicated bicycle facility planned along Kirby Road from the York Region Transportation Master Plan.	Ensures cyclists are safe and have space when cycling with traffic. Provides regional east-west connection and local connection between residential neighbourhood and mixed use activity centre.
Imp4	Separated bicycle facility planned along Weston Road from the York Region Transportation Master Plan.	Ensures cyclists are safe and have space when cycling with traffic. Provides north-south connection between existing residential neighbourhoods south of Teston Road and planned commercial and mixed uses along Weston Road in Block 41.

Reference	Description	Rationale
Imp5	Planned dedicated bicycle facility along Pine Valley Drive per City of Vaughan bicycle and pedestrian plan.	Connects existing development in the block with proposed development in south-west corner and existing development to the south.
Imp6	Connection between TCPL Trail and the Weston Road and Block 41 East-West Collector Road	Connects to the recommended new midblock crossing of Highway 400, the main east-west collector road in Block 27, the Kirby GO Station, and the North Maple Regional Park.
Imp7	Consider separated cycling facilities on Street 2	Separated on-street cycling facility on a critical collector road crossing the natural heritage system and connecting the different neighbourhoods in Block 41 to the regional cycling network between Teston Road and Weston Road.
Imp8	Consider separated cycling facilities on Street 4	Separated on-street cycling facility on a critical collector road connecting the different neighbourhoods in Block 41 to the regional cycling network between Kirby Road and Weston Road.
Imp9	Conduct further study to identify appropriate trail crossings of major corridors including watercourses and arterial roadways surrounding Block 41.	

8.4.6 Active Transportation Rail Crossings

As noted in the active transportation plans for Blocks 27 and 41, crossings of major corridors are barriers to active transportation and further study is required to address these barriers throughout the NVNCTMP study area. These barriers include watercourses, arterial roadways, and rail corridors.

With Metrolinx plans for all-day two-way GO rail service every 15 minutes through the NVNCTMP study area, further measures must be considered to limit risk and exposure to vulnerable users. It is recommended that City work with Metrolinx to provide safe crossings of the Barrie GO rail corridor by:

1. Allowing public crossings using Metrolinx infrastructure at station platforms
2. Protect for grade separated trail crosssings in the future

In other areas where trails encounter major environmentally sensitive features or water courses, effort should be made to overcome these barriers by working with governing agencies to identify an appropriate solution through further future study.

8.4.7 Wayfinding

Further to wayfinding recommendations surrounding the Kirby GO Station, wayfinding and public education for active transportation is critical to increasing public awareness of the off-road trail system in particular to make it a viable option for travel. Further study and funding should be identified with the purpose of identifying a strategy for wayfinding concurrent with trail implementation throughout the development blocks within the NVNCTMP study area as well as to improve integration with adjacent existing communities.

8.5 TDM Recommendations

The development of new residential and commercial space in the NVNCTMP study area provides unique opportunities to employ transportation demand management strategies during change moments. Research shows that people are more likely to consider a change in their commute when there is a change in residence, school or work location than at other times. In addition to implementing programming from the start, the new developments can be designed with infrastructure that will support the use of non-drive alone travel modes.

The strategies can be implemented and promoted in partnerships with existing and new partners to promote sustainable and active transportation throughout North Vaughan. The recommended strategies are summarized in **Table 8-10**.**Section 9.5** of this report provides further directions on implementation including identifying important partners and their roles in supporting the recommended strategies laid out in this TMP. Further details on the TDM recommendations are attached to this report as **Appendix G**.

Table 8-10: TDM Recommendations

Strategy	Directions	Partnerships
Residential / Community TDM	• Provide individual travel planning and marketing for all new residents in Blocks 27 and 41 • Community champions program • Identify a singular information portal for travel options, planning and information • Collaborate with local neighbourhood social networks • Design TDM programs for existing and planned recreational facilities, community centres including Maple Community Centre, Vellore Village Community Centre, and the future North Maple Regional Park	Healthyork, Metrolinx, Vaughan Cycling Forum
Developer TDM	• Introduce reporting requirements for developers and property managers reporting on TDM plan establish at site plan approval stage. To incent these reports, a reward/recognition program may be implemented similar to Smart Commute's workplace designation program. • Implement reduced parking requirements, unbundling, and other supportive policies at local centres, near higher-order transit hubs, and in primary centres / intensification areas. This includes primarily the local centre area surrounding the Kirby GO Station in Block 27. • Encourage / incentivize Smart Commute membership by developers and tenants	Smart Commute North Toronto Vaughan
School-based TDM	• Learn to Bike programs for physical education classes • Incorporate active transportation infrastructure (active / safe routes to school) into new school and their surroundings • Provide information / incentives / resources for students and parents to change travel behaviour • Create campaigns to create a culture of sustainable transportation • Bike safety education programs • Take advantage of regional programs including Healthyork and Metrolinx	Healthyork, Metrolinx, Safe Routes to School

Table 8-10: TDM Recommendations (continued)

Strategy	Directions	Partnerships
Business / Employer TDM	• Leverage partnerships with organizations and agencies already delivering sustainable programs to maximize reach. • Require major employers above a certain size to join Smart Commute • Implement workplace focused marketing campaign • Implement workplace individualized marketing programs at key employers • Create economic development materials to encourage TDM friendly workplace locations and development. • Survey workplace destinations of new residents, and explore opportunities for shuttle services, rideshare opportunities	
First and Last Mile Connections to Transit Stations	• Build on the lessons of the Milton GO Connect pilot program, which allowed individuals to schedule a subsidized taxi/Lyft/Uber ride to and from the Milton GO Station using an app. • Encourage carpooling to and from the local GO Train stations as well as the VMC subway station. • Promote multi-modal trip planning apps that also take into account bike, carpool or walk access to stations (such as the CityMapper app). • Create secure bike parking at GO Stations and prioritize AT infrastructure around stations. • Explore dedicated park and ride lots for carpooling to the subway station in coordination with rideshare marketing to residents about HOV lanes (as suggested in the VOP 2010). • Partner with SmartCommute North Toronto Vaughan to pilot EcoMobility Hubs[4] within Block 27 which include deisgnated safe waiting areas for rideshare, electric vehicle car share stations, bike share stations to leverage multiple shared mobility solutions	Metrolinx, Smart Commute North Toronto Vaughan

The last TDM strategy noted builds on York Region TMP recommendations is to improve first and last mile connections to transit stations, and the EcoMobility Hub[4] concept identified in **Section 8.3**. The Kirby GO station provides an opportunity for the City to develop a multimodal, transit and active transportation focused community around the station. The new station should be developed following the Metrolinx mobility hub guidelines, which emphasize seamless integration with other modes with a particular focus on pedestrian connectivity and parking management, a mixed-use environment, and an attractive public realm and station experience.

[4] [4] 1. 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.
2. 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.

9 Implementation Plan

The NVNCTMP provides recommendations on road network required to support the development and growth of the new community areas (Block 27 and Block 41) and the surrounding north Vaughan area. This chapter focuses on the implementation strategy and phasing of recommended improvements considering the opening and operation of future Kirby GO station, the forecasted traffic demand, planned Regional improvements, servicing availability and development of the new communities.

This NVNCTMP has followed the Municipal Class Environmental Assessment (MCEA) Master Plan process Approach #1 thereby fulfilling the requirements of Phases 1 and 2 of the MCEA process[5] for road projects including the identification of problems and opportunities and the selection of preferred solutions. Project sheets for each infrastructure project describing its impacts and the rationale for the preferred alternative are included in **Appendix F**. The NVNCTMP report and its technical analyses will become supporting documents for future works including secondary plans, block plans or EA study. Schedule B and C projects will require the completion of Phase 3 and 4 of the MCEA process before design and construction can proceed.

Future project specific Environmental Assessment studies to complete Phase 3 and 4 of the MCEA process should consider mitigating the environmental impacts of climate change, largely in relation to the natural heritage system and the water management system. Examples of efforts could include mitigating habitat fragmentation through enhanced wildlife passage under roads, edge management techniques to make the natural heritage system more resilient to the spread of invasive species, and water management approaches that emphasize low impact development and green infrastructure techniques to mitigate downstream flooding and erosion.

Best management practices shall be employed during construction to protect and minimize impacts to source water in the study area. While the exact mitigation plan will be refined in detailed design, practices will include, at a minimum, locating fuel storage, refueling and maintenance of construction equipment away from watercourses and preparing contingency plans prior to construction to control or clean up a spill should one occur.

Best management practices for the application of road salt will also be utilized to protect source water. The City currently updating its Community Sustainability and Environmental Master Plan, Green Directions Vaughan, which recommends a sustainability action that identifies best management practices to minimize salt use on hard surfaces and protect receiving watercourses from salinity increases in the environment.

[5] With the exception of new crossings of the natural heritage system, including Teston Road between Keele Street and Dufferin Street and Kirby Road between Bathurst Street and Dufferin Street. These missing links will each be required to undertake environmental assessments including a detailed network study to support an analysis of the need for the project and an analysis of alternative solutions. This includes an ongoing Individual EA study for Teston Road being undertaken by York Region and an EA study for Kirby Road being undertaken by Rizmi Holdings Ltd.

9.1 Phasing of Road and Transit Improvements

Transportation modelling analysis for interim 2021 and 2026 horizon years was completed to understand the timing requirements to support growth in the study area. Details on the analysis are provided in **Appendix D** and **Table 9-1** illustrates the projects in the study area, their recommended phasing based on the York Region TMP, and the recommended advanced phasing, if applicable. Projects highlighted in **green** are under City jurisdiction or are recommended advancements in timing (relative to York Region TMP).

Table 9-1: Implementation Plan for Projects within the Study Area

Project	Jurisdiction	YRTMP Phasing	Recommended Timing	Status
Block 27 Minor Collector Roads	City of Vaughan	-	In conjunction with the development of the Block	Satisfied Phase 1 & 2 of MCEA - to be implemented through Block Plan Process
Block 27 Major Collector Roads – Street 2 & Street 5	City of Vaughan		Build in conjunction with first phase of development to ensure connectivity & porosity	Remaining Schedule C Phase 3 & 4 MCEA requirements to be satisfied through Block Plan Process
Block 27 Vista Gate Extension	City of Vaughan		By 2026 and/or in conjunction with the development of Kirby GO station to facilitate access to GO Station	Schedule C to proceed into Phase 3 & 4 of MCEA
Block 27 Major Collector Road – Street '8'	City of Vaughan			
Highway 400 North Employment Lands (Block 34 and Block 35) Collector Road Network	City of Vaughan		Block 34: Build in conjunction with the development of the Block to ensure connectivity & porosity Block 35: Pending outcome of Northwest GTA Corridor Identification Study.	Schedule C remaining Phase 3 & 4 MCEA requirements to be satisfied through Block Plan Process
Block 41 Collector Roads	City of Vaughan	-	In conjunction with the development of the Block	Satisfied Phase 1 & 2 of MCEA - to be implemented through Block Plan Process
Cycling Facilities - Kirby Road, Highway 27 to Weston Road	City of Vaughan	-	2027 - 2031	Schedule A+, satisfied Phase 1 & 2, proceed to implementation alongside reconstruction project
Cycling Facilities - Kirby Road, Weston Road to Bathurst Street	City of Vaughan	-	By 2026	Schedule C, satisfied Phase 1 & 2, remaining Phase 3 & 4 of MCEA requirements to be completed alongside road improvement EA study
Urbanization of Keele Street with Separated Cycling Facilities	York Region + City of Vaughan		By 2026	Schedule B or C, satisfied Phase 1 & 2, remaining Phase 3 & 4 of MCEA requirements to be satisfied
Dedicated Viva Rapidway - Major Mackenzie Drive	York Region	2027 - 2031	York TMP	
Frequent Transit Network - Kirby Road	York Region	2028 - 2031	By 2026	
Frequent Transit Network - Bathurst Street	York Region	By 2021	York TMP	

Project	Jurisdiction	YRTMP Phasing	Recommended Timing	Status
Frequent Transit Network - Dufferin Street	York Region	2027 - 2031	By 2026	
Frequent Transit Network - Highway 27	York Region	2027 - 2031	York TMP	
Frequent Transit Network - Jane Street	York Region	2022 - 2026	York TMP	
Frequent Transit Network - Keele Street	York Region	2022 - 2026	York TMP	
Frequent Transit Network - Major Mackenzie Drive	York Region	By 2021	York TMP	
Frequent Transit Network - Pine Valley Drive	York Region	2027 - 2031	York TMP	
Frequent Transit Network - Teston Road	York Region	2027 - 2031	York TMP	
Frequent Transit Network - Weston Road	York Region	2027 - 2031	By 2026	
Grade Separation - Kirby Road - Barrie Rail Corridor	Metrolinx + York Region + City of Vaughan	2027 - 2031	By 2026	Schedule C, satisfied Phase 1 & 2, to proceed into Phase 3 & 4 of MCEA
Grade Separation - Teston Road - Barrie Rail Corridor	Metrolinx + York Region	2022 - 2026	York TMP	
Highway 400 Interchange at Kirby Road	MTO	2027 - 2031	By 2026	
Highway 400 Midblock Crossing, between Major Mackenzie Drive and Teston Road (4 lanes)	York Region + City of Vaughan	2027 - 2031	York TMP	Schedule C, satisfied Phase 1 & 2, to proceed into Phase 3 & 4 of MCEA
Highway 400 Midblock Crossing, between Teston Road and King-Vaughan Road (at least one, 4 lanes)	York Region + City of Vaughan	2027 - 2031	York TMP	Further study required pending outcome of Northwest GTA Corridor Identification Study
Jog Elimination - Kirby Road and Jane Street	York Region + City of Vaughan	2027 - 2031	York TMP	Schedule B or C, satisfied Phase 1 & 2, to proceed into Phase 3 & 4 of MCEA
Jog Elimination - Major Mackenzie Road and Highway 27	York Region	By 2021	York TMP	
Jog Elimination - Teston Road and Pine Valley Drive	York Region	2022 - 2026	York TMP	
Kirby GO Station	Metrolinx	By 2026	York TMP	
Regional Express Rail - Barrie Corridor	Metrolinx	By 2026	York TMP	
Road Reconstruction - Kirby Road, Highway 27 to Weston Road	City of Vaughan	-	2027 - 2031	Schedule A, proceed to implementation
Road Reconstruction - Pine Valley Drive, Teston Road to Kirby Road	City of Vaughan	-	2027 - 2031	Schedule A, proceed to implementation
Widening - Bathurst Street, Major Mackenzie Drive to Kirby Road (6 lanes)	York Region	2022 - 2026	York TMP	
Widening - Dufferin Street, north of Major Mackenzie Drive to Teston Road (4 lanes)	York Region	2022 - 2026	York TMP	

Project	Jurisdiction	YRTMP Phasing	Recommended Timing	Status
Widening - Highway 27, Major Mackenzie Drive to North City Limit (4 lanes)	York Region	2022 - 2026	York TMP	
Widening - Jane Street, Teston Road to Kirby Road (4 lanes)	York Region	2027 - 2031	York TMP	
Widening - Kirby Road, Weston Road to Bathurst Street (4 lanes)	York Region + City of Vaughan	2027 - 2031	By 2026	Schedule C, satisfied Phase 1 & 2, to proceed into Phase 3 & 4 of MCEA
Widening - Major Mackenzie Road, Jane Street to Highway 27 (6 lanes)	York Region	By 2021	York TMP	
Widening - Pine Valley Drive, Major Mackenzie Road to Teston Road (4 lanes)	York Region	2022 - 2026	York TMP	
Widening - Teston Road, Keele Street to Bathurst Road (4 lanes), including construction of missing link	York Region	2022 - 2026	York TMP	
Widening - Teston Road, Pine Valley Drive to Weston Road (4 lanes)	York Region	2022 - 2026	York TMP	
Widening - Weston Road, Teston Road to Kirby Road (4 lanes)	York Region	2027 - 2031	York TMP	

9.2 Kirby Road Grade Separation

As mentioned previously, the Kirby Road grade separation is recommended to be built prior or in parallel with the Kirby GO station construction for the following reasons (for details see **Appendix E**):

- Metrolinx has identified it as a Tier 1 priority for grade separation (as noted in Metrolinx's February 17, 2017 Memorandum regarding the RER Level Crossings Strategy).

- **Safety** – avoid level crossing of Kirby Road with the Barrie GO Line prior to development and GO Station operations:
  - With all-day two-way train service, Transport Canada's grade separation warrant exposure index threshold of 200,000 will be exceeded by 16 times,
  - Kirby Road has a 4% downgrade towards the level crossing which increases safety risk for heavy vehicles during slippery or icy conditions,
  - Minimize conflicts between GO trains and pedestrians and cyclists, and
  - Eliminates unsafe behaviour by motorists, pedestrians, and cyclists as seen at similar level crossings where the GO station is adjacent to the crossing.
- **Delays** – eliminate delays to transit, autos, pedestrians, and cyclists associated with a level crossing,
- **Avoid disruption of GO station access** – any vehicular, transit, and pedestrian access to an at-grade Kirby Road would need to be closed during construction of the Kirby grade separation. Traffic would have to be re-routed to Keele Street during the construction period,

- **Minimize disruption to GO train services** – building of the grade separation when the Station is operating would require closing of the train tracks for some time to allow for the installation of the grade separated bridge,
- **Minimize construction duration** – building the Kirby grade separation prior to significant development, the Kirby GO Station and a Highway 400 interchange would potentially allow for full closure of the road to reduce construction duration, and disruption to traffic and adjacent businesses,
- **Minimize throwaway construction costs:**
  - Existing Kirby Road is a two-lane rural road. If the level crossing is retained, existing Kirby Road would need to be upgraded to an urbanized cross-section and widened with turning lanes to serve the GO Station and Block 27. This reconstructed Kirby Road would need to be removed during construction of the grade separation,
  - Should the grade separation be built while the GO station is already operational, a detour road would need to be built, to maintain traffic access. The detour road not only disrupts station operations, but also adds throwaway construction costs,
  - Minimize risks with respect to the relocation and coordination of servicing infrastructure and utilities required during construction.

As Metrolinx identified the need to include five proposed stations along the Barrie rail corridor, the Kirby GO station being one of them, which were not evaluated in the Barrie Rail Corridor Expansion Environmental Project Report (BRCE EPR), Metrolinx prepared an addendum to the BRCE EPR. The notice of completion for the BRCE EPR Addendum was issued on August 2, 2018. Although the Kirby Road Grade Separation is not included in the Kirby GO station Reference Concept Design, the station design protects for the Kirby Road grade separation and the project team will work in coordination with the City to incorporate results and designs wherever possible from the Kirby Road Environmental Assessment undertaken by the City.

9.3 East-West Collector (Street 2) Grade Separation

Street 2 is the main east-west collector across Block 27 that provides connections to Jane Street and Keele Street. As a result, the collector road will cross the railway line at the east end of the Block. The Recommended City Collector Network illustrates this crossing as grade separated; however, before full development, this crossing can be at grade in the interim subject to Metrolinx approval. Grade separation for this crossing is recommended prior to the implementation of RER, as track twinning and all-day two-way service exceeds the warrant for grade separation. Additional information on feasibility analysis for this grade separation is provided in **Appendix A**.

9.4 Active Transportation Programs, Partnerships and Funding

Implementation of an active transportation network in North Vaughan will rely on partnerships between the City of Vaughan, York Region, private developers and other public, private and community entities. The recommendations in this TMP aim to complement and update those laid out in the City of Vaughan's 2007 Bicycle and Pedestrian Master Plan, the 2012 Vaughan Transportation Master Plan and the 2016 York Region Transportation Master Plan for regional roads in the study area (Highway 27, Weston Road, Jane Street, Keele Street, Dufferin Street,

Bathurst Street and sections of Teston Road). In addition, they complement recommendations for Block 27 and 41 plans.

9.4.1 Partnerships

Partnerships can not only facilitate and speed up the implementation of an active transportation network; they also offer opportunities to promote cycling and walking through programs, incentives, and events to ensure an efficient use of infrastructure. Local partnerships and connections with the local cycling community can help ensure plans are reflective of local needs and context.

9.4.1.1 YORK REGION

A 2015 York Region survey showed that the majority of residents think the Region should invest in more cycling facilities and offer more cycling education and skills programs. The City of Vaughan is taking a leading role in implementing new separated bike lanes in partnership with York Region along sections of Highway 7, Centre Street, Bathurst Street and Rutherford Road. As development in Blocks 27 and 41 progresses in North Vaughan, it will be important to implement the bicycle accommodations on regional roads.

9.4.1.2 GO TRANSIT AND YORK REGIONAL TRANSIT

Both GO Transit and York Regional Transit have shown commitment to active transportation by adding bike racks to buses, allowing bikes on GO Trains during off-peak times, and by creating bike parking at bus stops and stations**.** They are important partners in improving bicycle and pedestrian access to existing and planned bus stops and stations, thereby increasing first and last mile accessibility, and in promoting the use of active transportation to access stations and stops. As service increases along GO Transit routes in the coming years, active transportation access will become increasingly important.

9.4.1.3 YORK REGION DISTRICT SCHOOL BOARD - ACTIVE AND SAFE ROUTES TO SCHOOLS

There are several schools proposed in the plans under development for Block 27 and Block 41, providing excellent opportunities to incorporate pedestrian and bicycle infrastructure that allows children to travel to school safely. The York Region District School Board and The York Region Catholic School Board are currently involved in the GTHA wide Active and Safe Routes to Schools Hub program, which works with interested schools on promoting walking and bicycling to and from school. The new schools should be designed with bicycle and pedestrian access in mind and active and safe routes to school programming should be planned even before the schools open.

9.4.1.4 VAUGHAN BICYCLE USER GROUP

The Vaughan Bicycle User Group (BUG) is a non-profit formed by residents to promote “cycling as a viable and sustainable transportation alternative in Vaughan, unite Vaughan cyclists under one voice, encourage safe cycling, organize family cycling events and raise cycling awareness in the community”. The group can provide feedback, advocacy and political support for the implementation of a comprehensive bicycle network across North Vaughan.

9.4.1.5 VAUGHAN CYCLING FORUM

The Vaughan Cycling Forum is a city initiative that allows residents and cycling enthusiasts to learn about current and future efforts related to cycling within the city. The forum meets regularly

to discuss opportunities and provide feedback on city plans. The forum would provide an excellent channel to promote the active transportation elements of the TMP, discuss initiatives for successful implementation and secure early community buy-in.

9.4.1.6 SMART COMMUTE - NORTH TORONTO, VAUGHAN (SCNTV)

As Blocks 27 and 41 develop, SCNTV, the local TMA, will likely emerge as a partner to deliver work place programming to promote active transportation along with other TDM strategies in North Vaughan to employers relocating or starting up business. SCNTV (in partnership with the Metrolinx Smart Commute program) also has the ability to develop programming projects to support AT access to GO Transit services, and could be a valuable partner in growing ridership along key corridors.

9.4.1.7 DEVELOPERS

The City should work with developers in Blocks 27 and 41 to ensure that new residential and commercial developments tie into the surrounding bicycle and pedestrian network and generally provide an environment onsite that is conducive to walking and cycling. Secure and public bicycle parking, showers, locker rooms and pedestrian amenities should be provided to complement the active transportation network.

9.4.1.8 ACCESSIBILITY ADVISORY COMMITTEES

Local or regional bodies that represent the accessibility community can be effective partners in obtaining support and funding for pedestrian improvements.

9.4.2 Funding

This section describes potential funding sources currently available for active transportation projects.

9.4.2.1 MUNICIPAL

The City of Vaughan should continue to budget municipal funds for cycling and pedestrian projects. In addition, the city could explore developer agreements, tax increment financing and parking fees to raise funds for active transportation improvements in Blocks 27 and 41 and the Highway 400 North Secondary Plan Area.

9.4.2.2 REGIONAL

The York Region has an annual fund of $500,000 to help municipalities build new pedestrian and cycling infrastructure. The fund requires a 50 percent local match.

As the local TMA, Smart Commute – North Toronto, Vaughan can access funding from Metrolinx and York Region to deliver projects that support increasing AT access to GO Transit stations. This funding is part of the TMAs annual funding allocation from Metrolinx and York Region. Projects need to be led by the TMA, be programmatic in nature and cannot cover any capital costs. Funding allocations to any projects of this nature are subject to approval from both York Region and Metrolinx.

9.4.2.3 PROVINCIAL

Ontario Ministry of Transportation

MTO is currently taking comments on a proposed action, including funding, to accelerate the implementation of #CycleON by helping municipalities build cycling infrastructure and increase bike parking. Vaughan should track this initiative to be able to apply for funding when funding guidelines become available.

Approximately $150 to $225 million will be invested by Ontario's Climate Change Action Plan (CCAP) to create and support cycling networks. This includes bike parking at public building and transit stations, upgrading of existing cycling facilities, and adding cycling facilities in urban areas.

Ontario Trillium Foundation
The Foundation has a capital grants program for projects that broaden access, improve community spaces and promote energy efficiency. There are two stages in applying for the OTF and it requires an applicant to register their organization and to submit a grant application. By registering their organization, the OTF can ensure that the organization is eligible to receive a grant before an application is submitted.

9.4.2.4 FEDERAL GOVERNMENT

Federal Government transportation funding sources may be used for bicycle and pedestrian infrastructure funding. They may be most appropriate for large infrastructure projects that include an active transportation component. Funding sources include:

- **2014 New Building Canada Plan**: the Plan helps support projects that create jobs, improves productivity, and stimulates economic growth.
- **Federal Gas Tax Fund**: the fund helps local municipalities to invest in their local public infrastructure and can go towards projects such as public transit, roads, bridges, highways, and short-line rail.

9.4.2.5 GREEN DEVELOPMENT FUNDS

The Federation of Canadian Municipalities Green Municipal Fund provides funding for projects which reduce greenhouse gas emissions (GHG), including modal shift projects such as bicycle and pedestrian infrastructure. Projects which are eligible for the fund must exhibit their potential to reduce vehicle kilometres travelled for single occupancy vehicles.

9.4.2.6 OTHER FUNDING SOURCES

Funding opportunities may emerge from partnerships with public health departments, transit agencies and transportation departments, and school districts. Climate change initiatives at any level of government could be a potential funding source for active transportation projects. In addition, grants may be available from private foundations or corporate sustainability funds for specific projects.

9.4.3 Implementation Steps

The planned active transportation infrastructure identified in the NVNCTMP and the ongoing update to the City-wide Pedestrian and Bicycle Master Plan can be implemented immediately through development within both Block 27 and 41 as well as through the Kirby GO station.

Within Block 27 in particular, the Kirby GO Station is a significant transit investment that will encourage sustainable, long-distance travel which provides an opportunity to creating a comfortable first / last mile to the GO station for non-auto travel. This is critical to creating a complete community in Block 27 from day one, and active transportation infrastructure should be emphasized throughout Block 27 as a foundational element of the new community.

The City must also leverage opportunities alongside other planned City and Regional Road improvements to complete the active transportation network in accordance with the NVNCTMP and the City-wide Pedestrian and Bicycle Master Plan.

9.4.4 New Guidance Documents

Since the 2007 Pedestrian and Bicycle Master Plan was adopted, the Ontario Ministry of Transportation has issued new guidance for the design of bicycle facilities. It includes guidance for relatively newer facility types, which address the need to provide bicycle facilities for a currently underserved market: cyclists of all ages and abilities who are not comfortable riding on busy streets. They include raised cycle tracks, separated bicycle lanes and bicycle priority streets. The documents provide detailed guidance on facilities selection and design, which should be followed during implementation of the North Vaughan active transportation network plan.

- ***Ontario Traffic Manual (OTM) Book 18 – December 2013*** – applicable to all bicycle facilities in the province. (Note that an update to OTM Book 18 is currently underway and the City should be prepared to adapt to new standards that arise as part of the update).
- ***MTO Bikeway Design Manual – March 2014*** – applicable to bicycle facilities within the right-of-way of a provincial highway.

9.5 Travel Demand Management

Travel Demand Management (TDM) implementation recommendations are summarized below. A TDM report providing further details, prepared by UrbanTrans North America Limited, is attached to this report as **Appendix G**.

9.5.1 Coordinated Approach to Program Delivery

Blocks 27 and 41 provide an opportunity to coordinate all TDM efforts within each of the block to work together and reinforce each other. Recommendations include:

- City staff to oversee and coordinate all programs and work with Smart commute, schools, Metrolinx, development division, etc. to implement and track TDM programs, developer requirements and outcomes.
- Time TDM programming around the introduction of new services and the occupancy of new developments.

9.5.2 Piloting and Measuring New Programs and Approaches

In order to deliver the most effective programs that achieve behaviour change, the City should test new approaches with pilot programs, measure impacts and re-evaluate pilot or permanent programs based on the results. The following steps are recommended:

- Conduct focus groups to gather preliminary feedback and gauge interest among employees and residents.
- Implement pilot programs to test and investigate innovative TDM approaches.
- Measure impacts of pilot programs, evaluate, and decide on larger scale program implementation.
- Monitor program effectiveness on an ongoing basis to inform program improvements and future programming efforts.

9.5.2.1 ECOMOBILITY HUB PILOT PROGRAM

Partner with Smart Commute - North Toronto, Vaughan (SCNTV) to implement a pilot program for EcoMobility hubs within Block 27 to promote multimodal connectivity to and from Kirby GO Station and surrounding key destinations including the North Maple Regional Park. SCNTV is currently working with the City of Toronto on a similar pilot program in the Consumers Road Business Park Area, and a similar model should be considered surrounding the Kirby GO Station and Block 27.

9.5.3 Partnerships

The ability to successfully influence travel behaviour through implementation of the recommendations within the North Vaughan TMP will rely heavily on the city's partnerships with external agencies, other levels of government, and businesses and residents. The city has already established many of these partnerships, but should work with these partners to facilitate the implementation of the TMP. The city should continue to build relationships, work with partners to implement and study pilot programs, analyze results, and adjust programs based on community feedback and needs.

9.5.3.1 WORKPLACE

Workplaces have a key role to play in the delivery of the TMP. The daily commute is a significant trip generator, and workplaces are well placed to encourage their staff to use alternative travel modes and associated infrastructure, such as that laid out in the TMP. The City should seek to leverage partnerships with organizations and agencies already delivering sustainable transportation programs and messaging in order to maximize the reach of the city's TDM programs. There are a number of workplace related partnerships to explore and enhance:

i) Smart Commute – North Toronto, Vaughan

In order to implement the TDM elements of the TMP at the workplace level, the city should continue to work closely with the local TMA, Smart Commute - North Toronto, Vaughan (SCNTV). SCNTV is a non-profit TMA that operates as part of the GTHA region-wide Smart Commute network funded by Metrolinx, the local and regional municipalities and the private sector. Smart Commute NTV delivers workplace TDM programming across the north of the city of Toronto and to the whole of the city of Vaughan. SCNTV is unique in its direct connections with workplaces and their employees, conducting surveys of commuter travel behaviour and providing on-site programming. These connections to workplaces provide an excellent channel for communicating relevant elements of the TMP and identifying workplace partners that support the goals of the TMP. For example, Smart Commute workplaces may be well served by new HOV lanes or cycling infrastructure provided by the TMP. SCNTV should act as the conduit to provide messaging and promotion of this infrastructure to the workplace and deliver

programming to encourage its use. SCNTV should be a key player in influencing travel behaviour change that Vaughan is seeking to achieve through the TMP.

ii) City of Vaughan Economic Development

In addition to SCNTV, Economic Development can provide useful connections to local businesses, particularly those relocating into the area. Ensuring that new businesses moving into the city are aware of the TMP and encouraging them to relocate in areas served by TDM infrastructure can help increase sustainable commuting amongst their workforce. The city should work closely with Economic Development to promote the benefits of transit and bike friendly development sites and existing commercial properties to incoming businesses.

iii) York Region Public Health

York Region Public Health works with employers to develop wide-ranging workplace wellness programs. Increasingly, these programs (and the wider work of public health agencies) focus on increasing the use of active transportation by employees, both as a commute mode or a recreational activity. Additionally, public health units are recognizing the importance of "healthy by design" workplaces and communities. The opportunities to improve public health at the workplace are greatly increased if workplaces are served by supportive infrastructure such as bike lanes, walkable streets, and public transit. The city should partner with York Region Public Health to develop workplace wellness programs that actively promote the active transportation elements of the TMP.

9.5.3.2 COMMUNITY (RESIDENTIAL AND SCHOOL TRAVEL PLANNING)

i) Smart Commute – Metrolinx

Currently, SCNTV is limited to only with workplaces and employers. However, the parent organization, Smart Commute at Metrolinx, has the ability to work with municipalities on more community focused TDM programs. These would primarily relate to school travel and GO Station Access. The TMP will impact both of these areas, and a partnership would offer excellent opportunities for promotion.

ii) Vaughan Cycling Forum

The Vaughan Cycling Forum is for residents and cycling enthusiasts to learn about current and future cycling initiatives in the city of Vaughan. The forum meets regularly through the year to discuss opportunities and provide feedback on city plans. The forum would provide an excellent channel to promote the active transportation elements of the TMP and discuss initiatives for successful implementation.

iii) Healthyork – the York Region Healthy Communities Partnership

Healthyork collaborates with individuals, community partners and municipalities on initiatives that support and build healthy eating and physical activity policies for York Region residents. Healthyork is responsible for the Building Healthy Communities program, which encourages active modes of transportation including school travel planning, community walkability and bikeability and all inclusive recreation policy guidelines. This program provides an excellent opportunity to promote the active transportation elements of the TMP to the community. The Building Healthy Communities program supports active and safe routes to school planning, the Bicycle Friendly Communities program, the Walk Friendly Ontario program, and cycling advocacy in York Region as a whole. The active transportation impacts of the TMP will be of significant interest to Building Healthy Communities and its stakeholders.

iv) School Boards

School Boards are important partners for implementing school-based and community TDM. While most directly involved in approving and implementing school-based programs, the benefits of these programs tend to extend to the whole community as children and youth adopt more sustainable travel behaviours and influence their families, friends, and neighbours.

10 Future Considerations and Actions

10.1 Northwest GTA Corridor

Depending on the outcome of the Northwest GTA Corridor Identification Study, an update to the findings of the NVNCTMP may be required to consider and incorporate MTO's future recommendations; such as impact on the Highway 400 midblock crossing requirements, connections of transit network, goods movement network, and any other supporting infrastructure improvements.

10.2 Block 28 and 42 Growth

Blocks 28 and 42 are potential new community areas beyond the current urban boundary. Future study within the North Vaughan area should consider beyond 2031 potentially to 2041 to understand the impacts of potential Block 28 and 42 developments on the broader network.

10.3 Future Studies

The following studies are recommended to be undertaken by the City of Vaughan following the completion of the NVNCTMP:

- Kirby Road Environmental Assessment Study from Jane Street to Dufferin Street, including grade separation at Barrie Corridor GO railway and active transportation improvements, satisfying Phase 3 & 4 of the Class EA.
- Vista Gate Extension and Street '8' / GO Access #1 extension Environmental Assessment Study satisfying Phase 3 & 4 of the Class EA.
- City-wide Transportation Master Plan update to the year 2041

Subsequent studies pending adjacent development (i.e. concurrent with Block Plan Processes) and the outcome of Northwest GTA Corridor Study:

- Kirby Road widening and active transportation improvements from Weston Road to Jane Street Environmental Assessment Study to satisfy Phase 3 & 4 of the Class EA
- Environmental Assessment Study for Block 27 and Block 41 collector road networks – to satisfy Phase 3 & 4 of the Class EA, which maybe integrated with the *Planning Act* process.
- Environmental Assessment Study for Keele Street Urbanization and Cycling Facilities
- TransCanda Pipeline Trail EA study
- Northwest GTA Corridor supporting infrastructure study

For all future studies within the NVNCTMP Study Area, while this TMP identifies the transportation needs in the study area, further study is required to address and further assess impacts on the following:

- Due to the presence of archaeological sites throughout the NVNCTMP study area, future studies must consider in more detail the potential impacts to these sites and eliminate or mitigate any such potential impacts.

- Due to the presence of species or habitat protected under the Endangered Species Act, 2007 (ESA) within the NVNCTMP study area, future studies must consult with the MNRF, demonstrate project alternatives, and demonstrate the avoidance of potential impact to species at risk and their habitats.
- Oak Rides Moraine Conservation Plan (OMRCP) and Greenbelt Plan boundary areas which are affected by recommended transportation infrastructure should further assess policy requirements in consideration of alternatives and inform siting and route selection and construction and design considerations.

10.4 Other Future Considerations

In light of the province's ongoing work on the Greater Golden Horseshoe Transportation Plan and rapidly advancing transportation technologies which are changing the way that we move, it is recognized that the NVNCTMP reflects the current planned needs to the 2031 horizon year which are foreseen at this time. The City of Vaughan, in future updates to its transportation plans and visions must be prepared to be flexible, responsive, and resilient in its planning to account for rapidly changing technologies including new mobility solutions and connected and automated vehicles.