Vaughan Transportation Plan

Plan Report

FINAL

Vaughan, ON

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HDR

VAUGHAN

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Indigenous Land Acknowledgement

We respectfully acknowledge that the City of Vaughan is situated in the Territory and Treaty 13 lands of the Mississaugas of the Credit First Nation. We also recognize the traditional territory of the Huron-Wendat and the Haudenosaunee. The City of Vaughan is currently home to many Indigenous, Métis and Inuit people today. As representatives of the people of the City of Vaughan, we are grateful to have the opportunity to work and live in this territory.

Message from the Mayor

On behalf of Members of Council, I am pleased to introduce the 2023 Vaughan Transportation Plan - the City's blueprint for a transportation network that addresses Vaughan's future growth and development. As one of Canada's fastest-growing municipalities, preserving corporate assets, preparing for exponential growth and advancing a connected transportation system are critical components of the City of Vaughan's ongoing success. This plan lays out the vision for a future transportation system that offers everyone high-quality, competitive and sustainable travel choices, including the critical projects of the Nine Point Action Plan to Fight Traffic Gridlock.

Well-managed infrastructure fosters prosperity and contributes to the overall quality of life for residents, businesses and visitors. The 2023 Vaughan Transportation Plan immediately addresses the limited number of east-west connections in the network through planned road improvements, new road construction and targeted bridge enhancements to resolve bottlenecks and reduce gridlock. We continue to work effectively with our partners at York Region, Ontario's Ministry of Transportation, Metrolinx and national railway carriers to advocate for enhanced transit and GO rail service and upgrades to essential links in the road network.

Continuing the implementation of the 2020 Pedestrian and Bicycle Master Plan is a critical component of the City's plan to create the transportation system of tomorrow. Soon, our communities will be designed better to accommodate pedestrians, cyclists, transit riders and motorists. Also, innovative technologies are changing how travellers think about and use roadways, transit and other transportation services. Vaughan is ready to harness these new technologies as we think ahead and support a future transportation system.

The City of Vaughan's Infrastructure Planning and Corporate Asset Management department is essential to ensuring our city keeps moving forward. Their meaningful work and commitment are helping to develop a connected community in Vaughan and beyond. As we continue to build a world-class city, creating economically sound, safe, accessible and seamless transportation connections will ensure Vaughan remains a city of choice.

I want to express my sincerest gratitude to every member of Vaughan's Infrastructure Planning and Corporate Asset Management team for their continuous effort to address the challenges of today while keeping an eye on the opportunities of tomorrow. Through this plan, the City looks forward to working with residents, businesses, partners and stakeholders to accelerate the transition to a comprehensive and modern transportation system that will Get Vaughan Moving.

STEVEN DEL DUCA
Mayor, City of Vaughan

1 Introduction

The Vaughan Transportation Plan (VTP) is a long-range Transportation Master Plan (TMP) for the City of Vaughan (hereinafter referred to as "the City"). The City's first transportation plan was completed in 2012, and the VTP reviews and updates the planning context that influences the City, establishing the baseline transportation conditions today and in the future to 2051. The VTP provides directions for future transportation-related studies, projects, initiatives, policies, and decisions, and will guide transportation changes in the City to establish a network supportive of all users.

1.1 Purpose of the VTP

1.1.1 Why do we need a TMP?

The City of Vaughan is one of Ontario's fastest-growing cities, home to approximately 340,000 residents and 236,000 jobs.[1] By 2051, Vaughan's population is projected to increase to over 570,000, and projected to employ over 350,000 people.

Today, most people in Vaughan choose to travel using their private vehicles. This is because much of Vaughan was developed in a sprawling manner, optimized for vehicle travel, where destinations such as workplaces, schools, grocery stores, and other amenities are too far to walk or cycle from most homes. This also makes providing frequent, convenient transit service a challenge as well. As a result, traffic in Vaughan can be very congested, especially on major roads, because of the number of people who are trying to go to work, school, home, or run errands, all at the same time on the same roads.

As the City continues to grow, that growth will need to occur in a manner which facilitates more sustainable travel via walking, cycling or transit. This will enable more options to travel from one place to support the City's Strategic Plan goals of achieving a fully connected and integrated community, protecting the environment and fostering a sustainable future, and promoting active, safe and diverse communities. The VTP identifies the steps that need to be taken to take advantage of the opportunities we have and to address the challenges that we face.

1.1.2 What is the TMP?

A TMP is a study defined in the Municipal Class Environmental Assessment (EA) process (October 2000, as amended in 2007, 2011, and 2015) which identifies the long-term transportation objectives of a defined area and specific solutions requiring further study. TMPs build on the policies of the Official Plan and are developed through a consultation process involving the public, technical agencies, Indigenous and Aboriginal Peoples, and other stakeholders including affected property owners. The TMP process follows Phase 1 and Phase 2 of the five-phase EA process (as shown in **Figure 1-1**) by first defining a problem and/or opportunity statement followed by identifying and evaluating a range of alternative solutions to

[1] City of Vaughan. (n.d.). About Vaughan. Retrieved November 24, 2022, from https://www.vaughan.ca/news/about_vaughan/Pages/default.aspx

select one or more preferred solutions. Upon completion of the TMP, the preferred solutions can be studied further to meet the requirements of Phases 3, 4, and 5 as required.

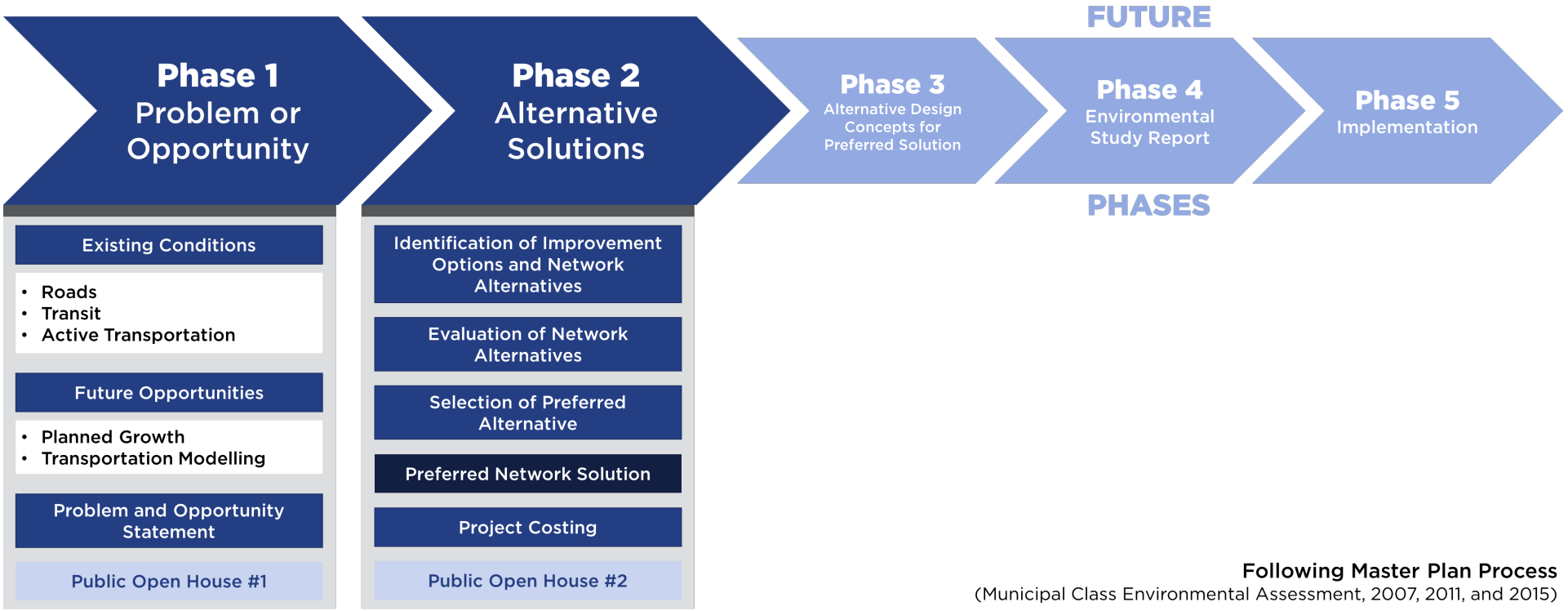


Figure 1-1: Transportation Master Plan Process

1.2 EA Study Process and Timeline

The VTP is being conducted per the Phase 1 and Phase 2 requirements of the Municipal Class EA process, which includes the following elements:

- Identifying the problems and opportunities for the transportation system in Vaughan;
- Determining future transportation networks (alternative solutions) to these problems and/or methods to take advantage of available opportunities;
- Evaluating the future transportation networks to recommend a preferred solution;
- Identifying appropriate policies to support a sustainable transportation system, and;
- Encouraging users to choose the form of transportation that best meets their needs.

Additionally, the Municipal Class EA process involves public consultation and stakeholder engagement throughout the entire process. The next phases of the MCEA process are:

- Phase 3: To identify alternative design concepts and identify a preliminary preferred design;
- Phase 4: Documenting the planning process through an Environmental Study Report (ESR), issuing a Notice of Completion and obtaining other approvals, and;
- Phase 5: Implementing the project per the ESR and monitoring/evaluation.

Figure 1-2 presents the process and timeline that was followed during the development of the VTP, along with associated tasks and consultation/engagement for Phases 1 and 2.

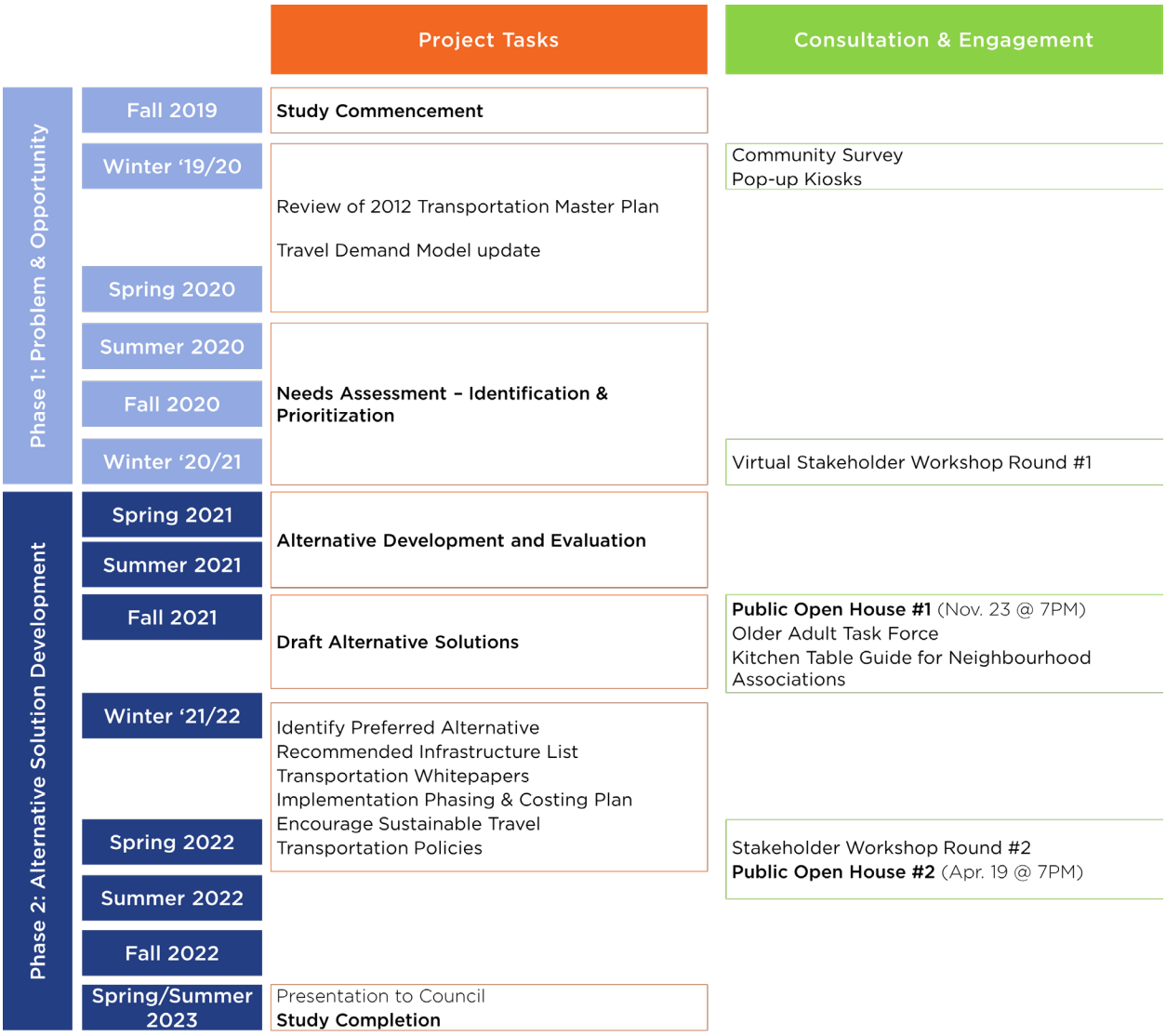


Figure 1-2: VTP Study Process and Timeline

1.3 Plan Structure

This plan report is structured in the following manner:

- **Chapter 1** introduces the VTP, establishing the need and purpose of the TMP and describes the development of the VTP in accordance with Phase 1 and Phase 2 of the EA process.
- **Chapter 2** describes the existing transportation conditions within Vaughan including current policy context, forecasted future conditions and concludes with key findings of the needs and opportunities analysis.
- **Chapter 3** provides a summary of the consultation activities undertaken throughout the study during different phases, along with the parties consulted and how their input was used to inform plan development.

- **Chapter 4** describes the vision of the VTP, building off the existing conditions' analysis, identifies a new path forward and the Problem and Opportunity statement for the plan.
- **Chapter 5** summarizes the selection and evaluation of different alternatives to arrive at a Preferred Transportation Infrastructure Alternative and its components.
- **Chapter 5.5** discusses what guides transportation culture today and how to encourage the use of sustainable modes.
- **Chapter 7** discusses policy-related recommendations/action plans to enable more mobility choices within the City through areas other than building infrastructure.
- **Chapter 8** describes the implementation plan to deliver the Preferred Transportation Infrastructure Alternative, including phasing, high-level cost estimates, and monitoring, along with recommended future VTP updates, future plans and studies.

2 Vaughan Today

This chapter describes the City of Vaughan's history, its planning context, land use and existing conditions. It concludes with key findings of needs and opportunities where infrastructure improvements and policy recommendations can be targeted.

2.1 History of Vaughan

The City of Vaughan originated from a group of rural villages, namely Woodbridge, Kleinburg, Maple and Thornhill, which were incorporated with the surrounding countryside to create the Town of Vaughan in 1974. These communities were rural in urban form during the 1970s and dated back to 19th-century settlements.

Vaughan was quickly transformed from a series of agricultural villages in the rural countryside to Greater Toronto to one of the largest and most rapidly growing suburban municipalities in Canada. Between 1971 and 1991, the Town's population grew from 15,000 to 100,000 and in 1991, Vaughan was incorporated as a City.

During the 1990s, Vaughan continued to grow at a rapid pace, not only in population, but also in employment, and this growth was characterized by residential single-family homes and low-density employment and commercial areas adjacent to the freeways with extensive surface parking. This type of development encouraged travel by personal automobile.

As a result, many of the City's streets take a primarily suburban form defined by large blocks and curvilinear streets. This is also reflected in street design at the segment and intersection levels. Many arterial and collector streets are characterized by wide rights-of-way, wide vehicle travel lanes, and large corner curb radii to facilitate higher travel speeds. Cycling facilities are uncommon, and there are gaps in the sidewalk network.

The transformation of the transportation system in Vaughan has already begun, with increased recognition that moving people by transit is more efficient, and financially sustainable. Recently completed transit investments such as the Toronto-York Spadina Subway Extension to Vaughan Metropolitan Centre in 2017 and the Viva Transitway between Richmond Hill Centre and Pine Valley Drive in Vaughan have helped to drive this change in mindset. Vaughan's Pedestrian and Bicycle Master Plan (PBMP) outlines an approach to providing safer and more accessible walking and cycling facilities for people of all ages and abilities, connecting people directly to the places they want to go, or to transit if they need to travel afar.

2.2 Overview

The City of Vaughan first developed a TMP in 2012, which identified the City's "New Path" forward, and recommended actions, infrastructure improvements and policy direction. This plan involved seven main objectives:

1. Increase Mobility;
2. Improve Safety;
3. Improve Reliability;
4. Increase Accessibility;

5. Meet Transportation Demand Management (TDM)/Transportation Systems Management (TSM) Objectives;
6. Achieve Sustainable Built Environment/Land Use, and;
7. Reduce Environmental Impacts.

The City of Vaughan set into motion several initiatives following the completion of the 2012 TMP. As one of the first tasks in the development of the VTP, a review of the 2012 TMP was undertaken, which is included in **Appendix A: Review of the 2012 TMP**.

Amidst rapid growth, the City of Vaughan has experienced an increase in the overall number of trips, more congestion and higher travel times on the City's road network. According to the 2016 Transportation Tomorrow Survey (TTS), residents of the City of Vaughan complete approximately 585,000 trips daily, which represents a 23% increase compared to 2006, when residents completed only 477,000 trips daily.

Roughly a quarter of these trips (approximately 160,000) are taken during the AM peak period, with the remainder occurring during the PM peak period (200,000 trips) and off-peak period (240,000 trips). **Figure 2-1** presents the distribution of start times of trips originating from Vaughan, by AM, PM and off-peak periods.

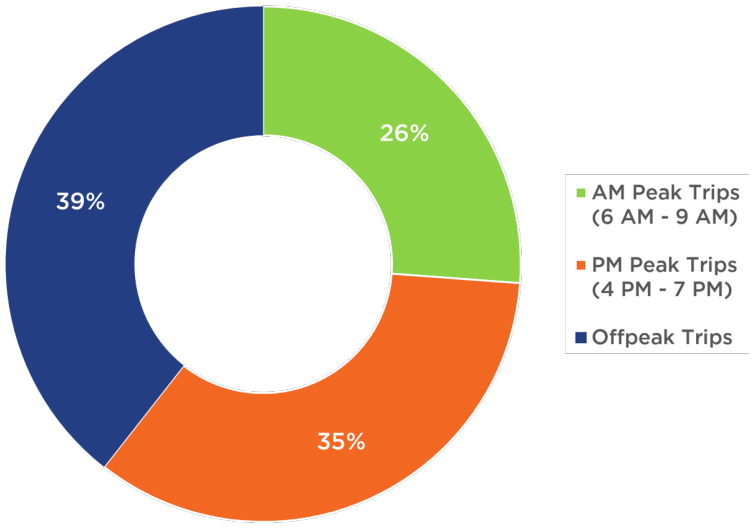


Figure 2-1: Start time of trips from Vaughan

Rising congestion has become more pronounced in recent years; its effects on reliability and travel speeds may be attributed to both population growth and continued reliance on the automobile as the primary mode of travel. Accordingly, the mode shares for transit, walking and cycling have remained largely unchanged since 2006. **Figure 2-2** presents the daily mode shares of Vaughan households in 2006 and 2016 TTS.

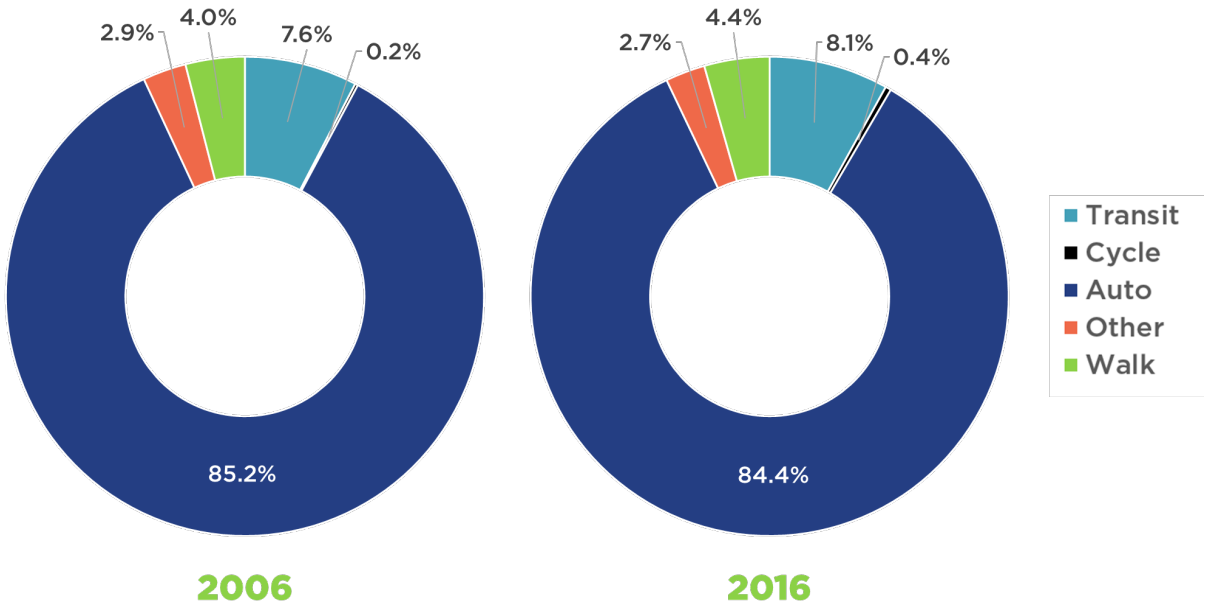


Figure 2-2: City of Vaughan Household Daily Mode Shares, TTS 2006 and 2016

Mode shares in general have remained relatively constant in the ten-years between the TTS surveys above. This offers the opportunity for the VTP to focus on accommodating growth through a transportation system that provides people with more travel options aside from the auto, particularly for shorter trips. Additionally, because of the increasing impacts of climate change, providing sustainable travel modes is becoming more important. In the context of Vaughan's development, changes in its built-form and movement toward mixed land use, the provision of high-quality cycling and walking facilities and networks are important trends to be noted.

It should be also noted that the mode shares above may be underestimating non-auto shares and their improvement, primarily due to two limitations of TTS. Firstly, TTS data generally under-represents walking and cycling trips, and recreational trips (which are more likely to be completed by active modes). Secondly, the transformation of the transportation system in Vaughan has already begun, and several improvements in their early stages may not be captured. This includes major projects completed after 2016, such as the Toronto-York Spadina Subway Extension and the VIVA Bus Rapid Transitway between Richmond Hill Centre and Pine Valley Drive. Many other VIVA initiatives are underway, and land use changes through the development of Primary Centres are in their early stages. These improvements will have a considerable impact on travel patterns, behaviours and mode shares.

Through a review of the 2012 TMP objectives and evaluating progress towards achieving these goals, a time difference was noted between when infrastructure changes occur and when data on changing behaviours will be available. The VTP will guide the planning and execution of a coherent transportation vision, along with plan monitoring measures to track progress.

Managing congestion through building more and wider roads has been established as ineffective, as this approach encourages more driving, and consequently, more congestion through a phenomenon called “induced demand”. Evidence for this has been observed on a worldwide basis [2,3] and in North America [4,5] and affirms that providing choices that allow people to drive less is a vital component of managing congestion in Vaughan. Enabling other modes such as walking, cycling or taking transit will lessen the demand on the road network, leaving room for those who must drive to get to their destinations reliably.

However, there will still be a need for newly constructed or improved roads. In new development areas they will be required and should be designed to accommodate vehicles, transit, cyclists and pedestrians. Targeted improvements to bridge gaps in the network and resolve bottlenecks will still be required and reviewed. Driving is will still be an essential mode, both to move people and to move goods. The need to drive will certainly not disappear, but, should no longer be the only reasonable option to get around for the majority of trips.

Enabling additional transportation choices will require building infrastructure that allows convenient and safe use of different transportation modes, and changing habits that were formed when driving was the only feasible option. The VTP will support both of these through policy and analysis, managing congestion through the provision of feasible transportation choices for residents, visitors and businesses.

Planning context at the provincial, regional and local levels are described in the following subsections.

2.2.1 Provincial Planning Context

2.2.1.1 CONNECTING THE GGH: A TRANSPORTATION PLAN FOR THE GREATER GOLDEN HORSESHOE

The Ministry of Transportation for Ontario (MTO) released its transportation plan in March 2022 for the Greater Golden Horseshoe (GGH) region, setting out a 30-year vision of a transportation system that provides safe, efficient, and convenient options for people and businesses, and supports the well-being and economic prosperity of the region into the future. The GGH Transportation Plan has four main themes, illustrated below in **Figure 2-3**.

[2] Hsu, W.-T., & Zhang, H. (2014). The fundamental law of highway congestion revisited: Evidence from national expressways in Japan. Journal of Urban Economics, 81, 65–76. https://doi.org/10.1016/j.jue.2014.02.002

[3] Garcia-López, M.-À., Pasidis, I., & Viladecans-Marsal, E. (2022). Congestion in highways when tolls and railroads matter: Evidence from European cities. Journal of Economic Geography, 22(5), 931–960. https://doi.org/10.1093/jeg/lbab025

[4] Duranton, G., & Turner, M. A. (2011). The Fundamental Law of Road Congestion: Evidence from US Cities. American Economic Review, 101(6), 2616–2652. https://doi.org/10.1257/aer.101.6.2616

[5] Hymel, K. (2019). If you build it, they will drive: Measuring induced demand for vehicle travel in urban areas. Transport Policy, 76, 57–66. https://doi.org/10.1016/j.tranpol.2018.12.006

Figure 2-3: Greater Golden Horseshoe Transportation Plan Themes

The GGH Transportation Plan's recommendations informed and influenced policy direction and transportation priorities across the GGH, including the City of Vaughan.

2.2.1.2 A PLACE TO GROW: GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE

A Place to Grow is the Ontario government's initiative to plan for growth and development in a way that supports economic prosperity, protects the environment, and helps communities within the GGH achieve a high quality of life.

A Place to Grow identifies the Vaughan Metropolitan Centre (VMC) as an Urban Growth Centre that will be planned "to accommodate and support the transit network at the regional scale and provide connection points for inter- and intra-regional transit". The Growth Plan also identifies priority transit corridors that connect the VMC to other regional Urban Growth Centres.

It also identifies priority transit corridors and provincial direction to focus population and employment growth around Major Transit Station Areas (MTSA), which will have major implications on where and how Vaughan will grow, impacting the City's transportation needs.

2.2.2 Regional Planning Context

2.2.2.1 YORK REGION OFFICIAL PLAN

York Region adopted the current 2022 Regional Official Plan in June 2022, which was subsequently approved by the Minister of Municipal Affairs and Housing in November 2022. This updated Official Plan guides new planning and development in York Region through an alignment of land use, financial sustainability, infrastructure, and phasing to manage significant growth through 2051.

One of the key guiding planning principles identified as part of this is enhancing mobility systems through a "people and transit first approach" to connect land use and transportation planning. This will be achieved by completing Master Plans for all modes of transportation including transit and active modes.

The Regional Official Plan also aims to support Complete Communities by creating vibrant, complete, and sustainable communities where people can live, work, play, learn and enjoy high quality of life. Key to this objective is transportation, with policies pertaining to Complete Communities aimed at creating well-designed integrated greenspace, trails, pedestrian and transit networks that offer a variety of transportation options.

Transportation planning in the updated Official Plan places an emphasis on making the most of existing and planned transportation infrastructure while also considering the effects of a changing climate. York Region's objective for transportation is to "provide a full range of transportation facilities throughout York Region, while reducing automobile dependence by enhancing opportunities for residents and workers to walk, cycle, take transit and carpool". Innovative, convenient, and reliable alternative modes of transportation are necessary for reducing automobile dependence, which are addressed in the Official Plan using a combination of infrastructure investment, supportive policies, and partnerships.

The Region provides four transportation-related maps: Regional Cycling Network, Regional Trail Network, Rapid Transit Network, and Street Network (that presents the regional planned rights-of-way on regional roads). Preferential treatment will be provided for transit corridors on regional roads through the provision of high-occupancy vehicle lanes, dedicated transit lanes, transit signal priority, and other transit priority measures.

The Region also states its commitment to work with local municipalities to co-ordinate infrastructure along Regional Streets for operating and capital components, including street lighting, sidewalks, multi-use paths, and cycling facilities; and to ensure that sidewalks and street lighting are provided on both sides of all streets within the Urban Area, and Towns and Villages that are serviced by transit. Policy also requires local municipalities to design street systems to accommodate pedestrian, cycling and transit facilities.

2.2.2.2 YORK REGION TRANSPORTATION MASTER PLAN

York Region's updated Transportation Master Plan was approved in September 2022. It is an updated long-term vision based on four areas of focus: Economic Vitality, Good Government, Healthy Communities and Sustainable Environment. This update accommodates population and employment growth in line with updated provincial forecasts, and contains three main elements:

1. **Active transportation:** supporting a well-integrated and well-connected network of cycling facilities, trail and multi-use paths to make these options easier and safer for all users.
2. **Rapid transit:** additional rapid transit corridors to address growth to 2051 and beyond.
3. **Optimized road network:** investments to manage traffic flow in the Region's most congested areas.

Additionally, the plan includes future network maps to identify required infrastructure in York Region by 2051. Similar to the VTP, the 2022 York Region TMP follows the Municipal Class EA process and aligns with provincial legislation and guidance. In addition, new infrastructure identified in the 2022 York Region TMP was incorporated in the alternatives analyzed by the VTP.

2.2.3 Local Planning Context

2.2.3.1 VAUGHAN OFFICIAL PLAN

Vaughan's Official Plan (VOP), adopted by Vaughan City Council in September 2010 and with a June 2019 Office Consolidation partially approved by the Ontario Municipal Board, outlines policies that affect the future growth of the City and its transportation system. Critically, one of the VOP's eight goals is to support moving around without a vehicle. As such, the VOP includes planning and design policies to make walking, cycling and transit use realistic options for moving around, and recognizes the integrated roles of land use, urban design, and transportation decisions. It emphasizes that the primary consideration for enhancements to the street network are to support transit and rapid transit, cycling, walking and that new streets and the redesign of existing streets should have a balanced right-of-way that supports all needs. Infrastructure should be designed to be sustainable and resilient.

Vaughan's Official Plan recognizes that the historical pattern of growth and current urban structure has created several issues in Vaughan (and other suburban municipalities), including:

- car dependence, traffic congestion and increased commuting times;
- low-density, single-use areas that do not allow for the efficient provision of transit;
- a limited range of housing options, and;
- a significant loss of agricultural and natural areas.[6]

Currently, an Official Plan Review (OPR) process is underway, which will culminate with an amendment to the Vaughan Official Plan. The context within which the City continues to grow and evolve has changed since VOP 2010 was prepared and adopted, as have the trends and drivers directing these changes. Reviewing VOP 2010 provides the City with an opportunity to adopt contemporary land use and development policies that will guide growth and development to the year 2051. The OPR follows a principled approach rooted in environmental sustainability, social responsibility, and economic development to plan for complete communities and guide the city's growth for the next 30 years and beyond. The VTP is intended to inform the OPR, providing transportation-related input.

2.2.3.2 GREEN DIRECTIONS VAUGHAN

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

Several transportation-related actions were identified as part of GDV, including:

- Implementing electric vehicle (EV) charging at City facilities and encouraging infrastructure across the City to support EVs;
- Implementing sustainability metrics as a component of the development review process;

[6] City of Vaughan. (2022). Vaughan Official Plan, Volume 1. City of Vaughan.

- Planning and implementing a complete streets framework and guideline, non-vehicular networks, and recreational trail network;
- Developing frameworks for first- and last-mile initiatives to promote transit use, implementing a fine-grained network of streets and block lengths to enable efficient movements, and;
- Collaborating with York Region and community partners to implement Transportation Demand Management (TDM) initiatives to reduce congestion and promote transit, active transportation and carpooling.

2.2.3.3 PEDESTRIAN AND BICYCLE MASTER PLAN

An update to the City's Pedestrian and Bicycle Master Plan (PBMP) was completed and approved by Council in December 2019. The key outcomes and recommendations of the PBMP are highlighted in this Chapter as they form and inform many of the recommendations of the VTP.

Figure 2-4 shows the priority cycling network identified in the PBMP. In addition to regional and local routes, it is also composed of a multi-use recreational trail network that includes the 100km Vaughan Super Trail, which forms a continuous circular loop around the City of Vaughan. The study also prioritizes localized mini networks in the Maple, Thornhill, and Woodbridge neighbourhoods, as well as at Intensification Centres.

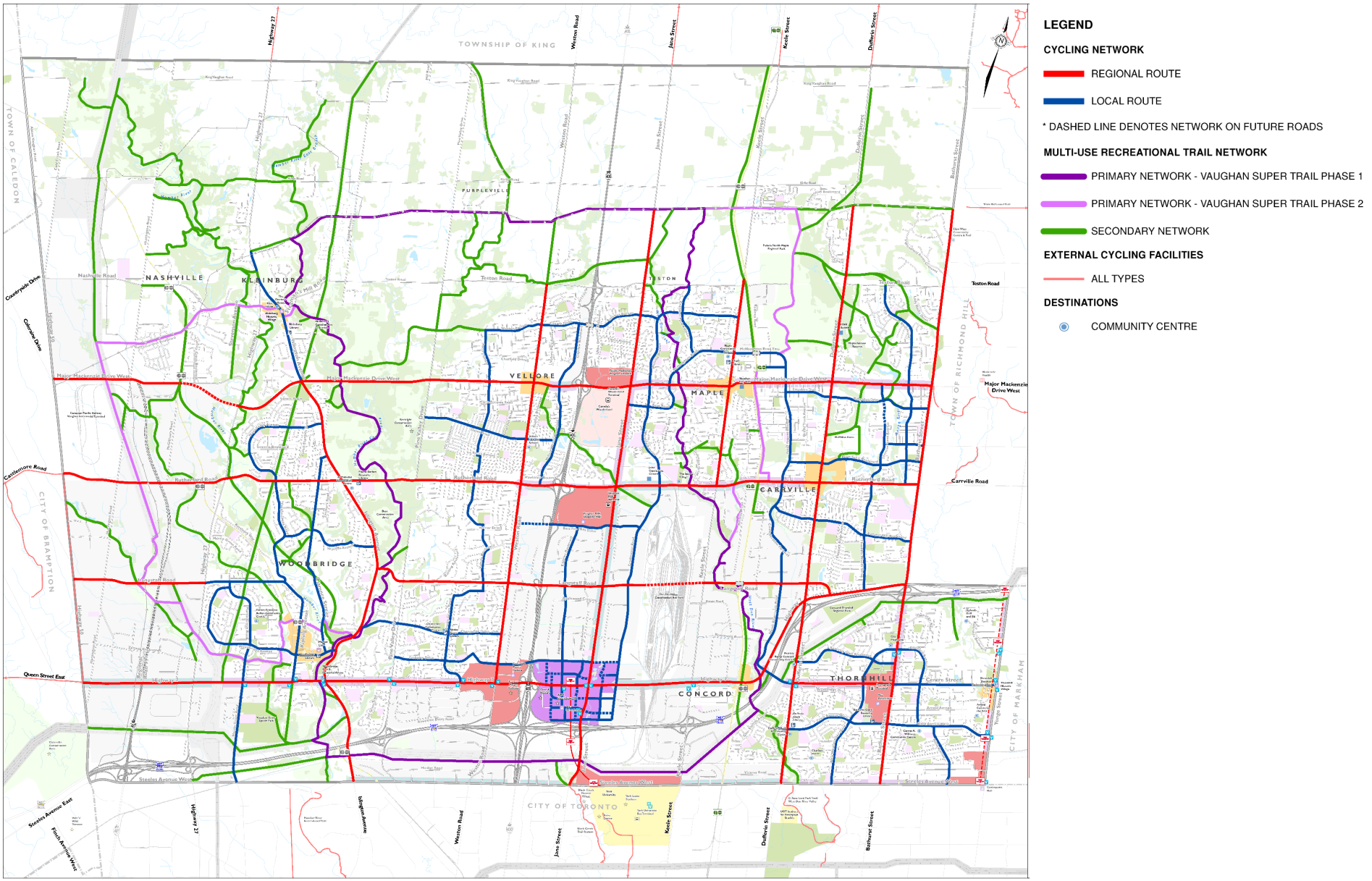


Figure 2-4: Priority Cycling and Multi-Use Recreational Trail Network in the PBMP

In addition to the priority network, the study also identified policy recommendations in four groups: Awareness and Culture, Safety, Infrastructure, and Connectivity. Key policy recommendations related to the VTP include:

- Provide active transportation infrastructure that is suitable for all ages and abilities;
- Identify and leverage larger capital projects and development to improve active transportation infrastructure;
- Update the City-wide Engineering Design Criteria and Standard Drawings to consolidate all existing standards and guidelines and reflect current best practices in design of pedestrian, cycling and multi-use recreational trail design;
- All new arterial and collector roads shall include protected intersections, separated linear active transportation facilities on both sides of the roadway and consider crossings that will service the multi-use recreational trails system in order to provide the most direct and comfortable route for pedestrians and cyclists; and
- Continue to research new and emerging trends and technologies such as bike share, e-bikes and e-scooters.

2.2.3.4 SECONDARY PLANS FOR INTENSIFICATION AREAS

The City of Vaughan has completed or is in the process of completing a number of area-specific planning studies in intensification areas which coordinate development growth with transportation. Many of these Secondary Plans are focused on infill transit-supportive development, aiming to align land use planning and more sustainable travel behaviour, in alignment with VTP objectives. These area specific studies are critical to the future growth of the City in a manner which supports transit and active transportation and reduces reliance on the personal automobile.

2.3 Planning and Land Use

Schedule 1 of Vaughan's Official Plan presents the proposed urban structure in Vaughan, which consists of:

- **Natural Areas and Countryside**, areas to be protected against urban use,
- **Community Areas**, designated for low-rise residential purposes, such as parks, community, institutional and retail,
- **New Community Areas**, which will prioritize people, sustainability and liveability and developed with high-quality urban design,
- **Employment Areas**, which are intended for the use of economic activities that require separation from other uses,
- **Rail Facilities**, major rail areas that play a critical role in continental rail transportation and goods movement, and
- **Intensification areas**, that range in height and intensity of use:
    - The Vaughan Metropolitan Centre (VMC), which is the major focus for intensification and development,

- Regional and Primary Intensification corridors, which will link VMC with other intensification areas in Vaughan and York Region,
- Primary centres, intensification through mixed-use high- and mid-rise buildings at intensities supportive of transit, and
- Local centres, which provide mixed-use focus in a manner compatible with the local context. **Figure 2-5** presents the urban structure according to VOP Schedule 1.

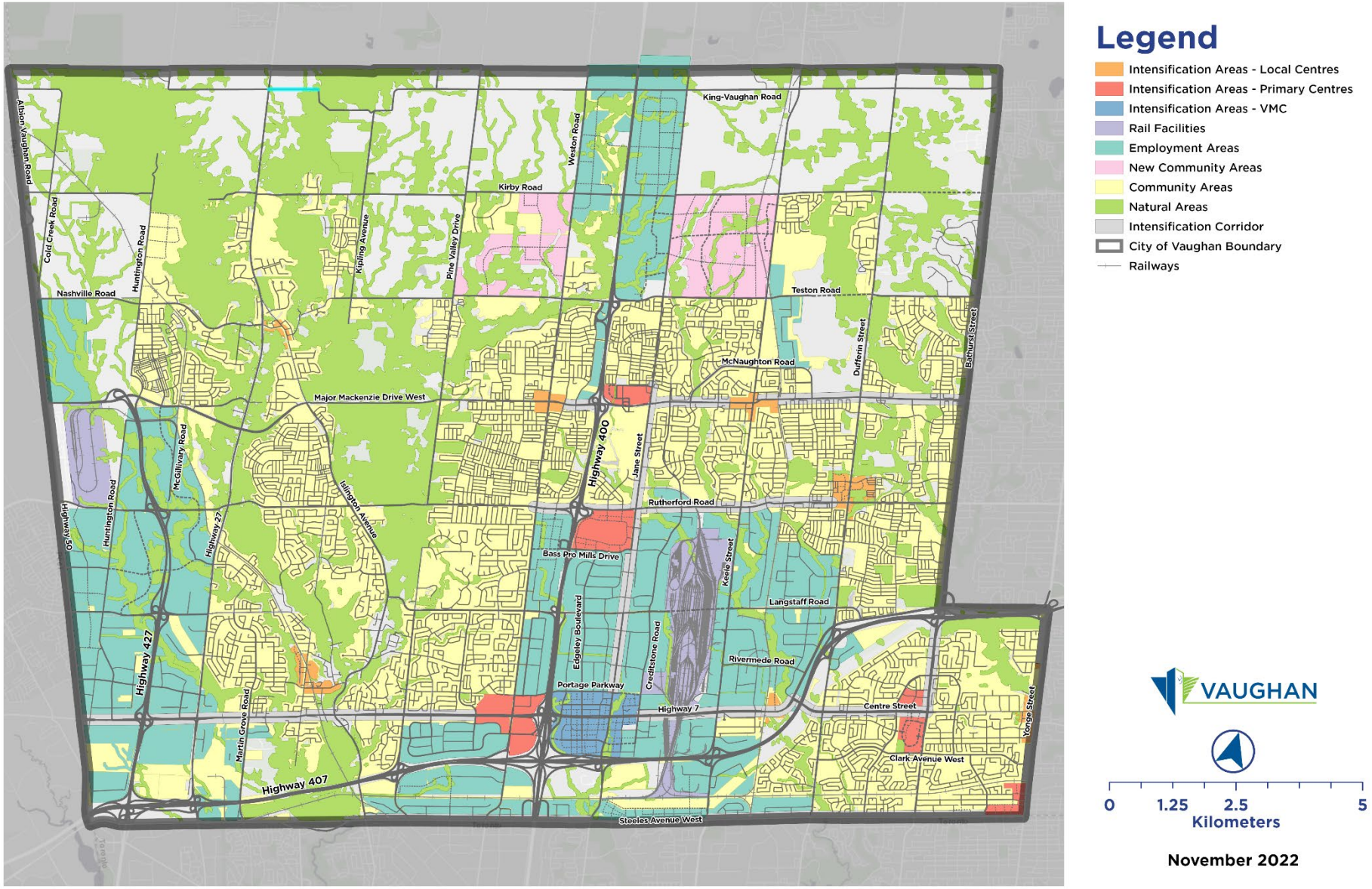


Figure 2-5: Urban Structure in the City of Vaughan

This plan leverages the urban structure in **Figure 2-5**, building upon it to recommend improvements consistent with the area-based context. Additionally, existing policies and street classifications in the VOP were reviewed and policy inputs were provided based on VTP outcomes and recommendations for the ongoing Official Plan Review.

2.4 Population and Employment

The City of Vaughan has historically been one of the fastest-growing municipalities in Canada in the last 30 years. **Table 2-1** presents the historical population in 2006, 2022, and the 2051 planning horizon forecasts.

Table 2-1: Population and Employment Forecasts for the City of Vaughan

	2006	2022	2051
Population	249,300	341,000	571,400
Employment	162,200	227,000	352,100

(Source: 2016 from Vaughan's Official Plan, 2022 per City of Vaughan Website, 2051 per Regional Forecasts)

Figure 2-6 and **Figure 2-7** present the population and employment, respectively, land use for 2016 and 2051. The following were noted:

- High population growth was forecasted in North Vaughan, Northwest Vaughan, VMC and the Kleinburg areas.
- High employment growth was forecasted in West Vaughan.

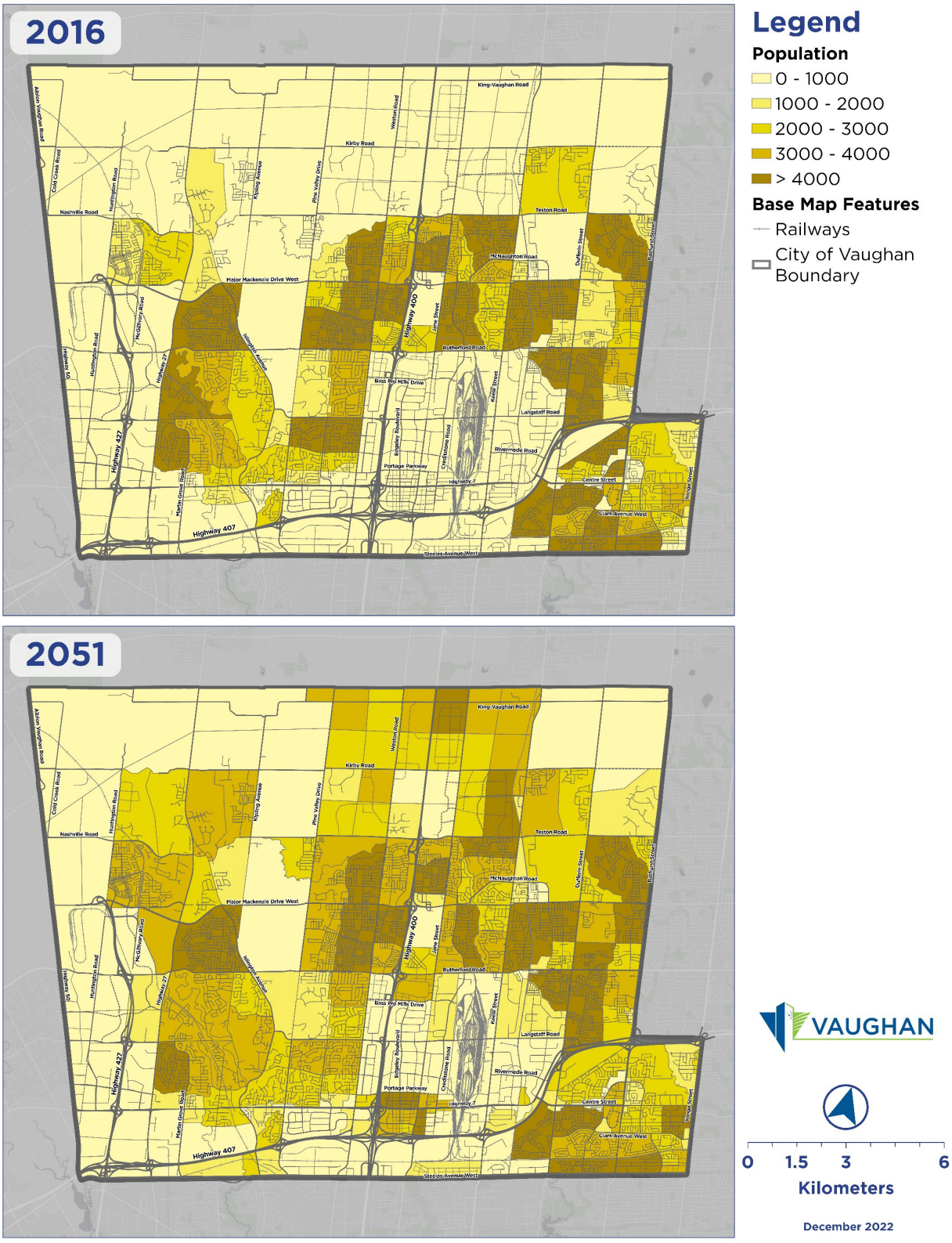


Figure 2-6: Population forecasts in the City of Vaughan

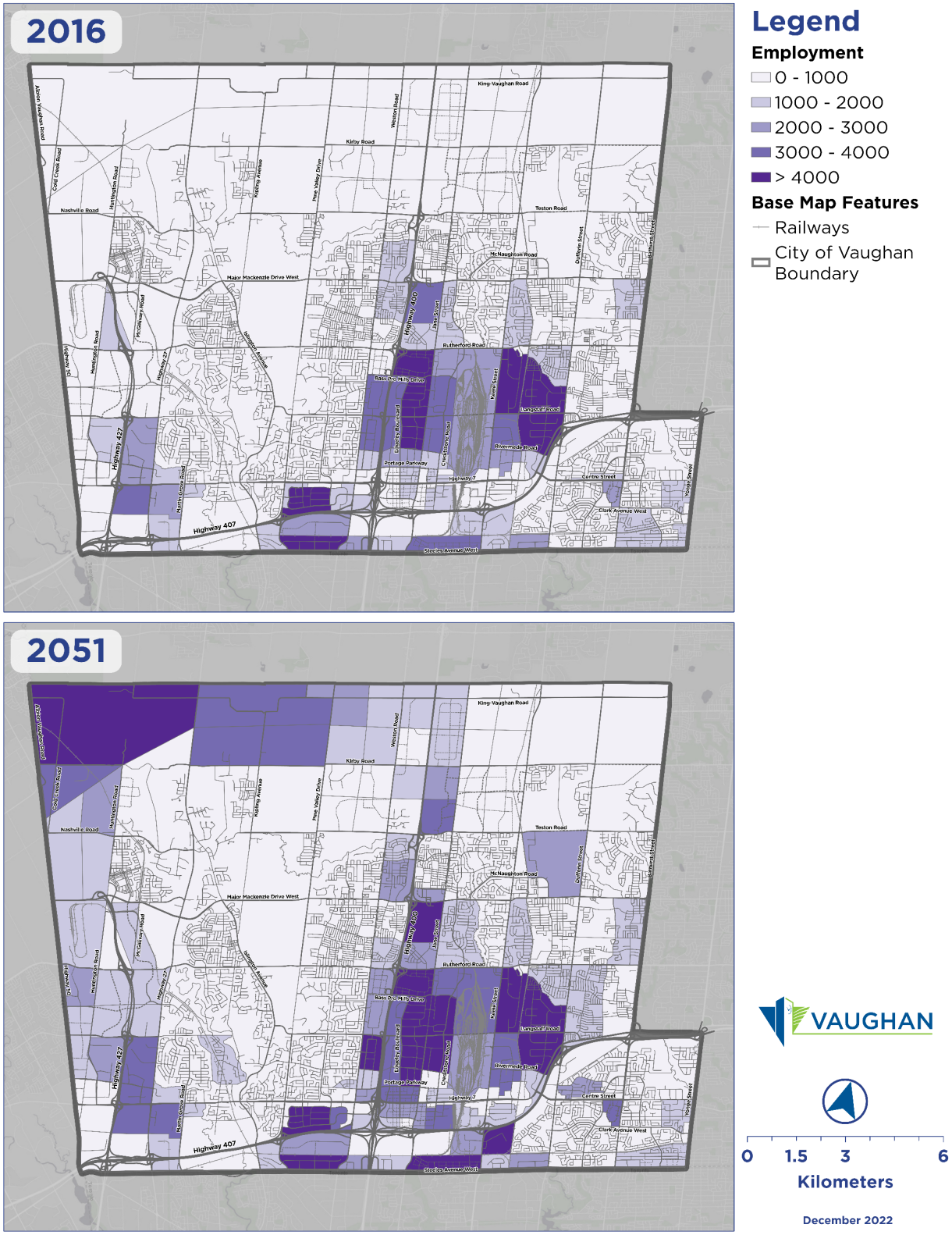


Figure 2-7: Employment forecasts in the City of Vaughan

2.5 Transportation Needs Assessment

The VTP intends to create a transportation system with mobility choices, and so it is important to invest effort in identifying issues not only for the road and transit network but also for the walking and cycling network. This will ensure that the available infrastructure is well-connected, comfortable, safe, and accessible, which in turn will encourage Vaughan residents and visitors to make more sustainable travel choices. To do so, the identification and prioritization of opportunities in the network (or "needs" as they will be referred to in this chapter), as well as the identification and evaluation of transportation infrastructure improvements, must explicitly consider all modes of transportation: autos, transit, bicycles, and pedestrians. The assessment followed the steps shown below in **Figure 2-8**, with the first three steps described in this chapter, and the latter two steps described in **Chapter 5**. The complete needs assessment is also provided as **Appendix B: Transportation Needs Assessment and Alternative Development**.

Figure 2-8: Transportation Needs Assessment Process

2.5.1 Vaughan Travel Demand Model

To assess transportation needs and establish existing conditions, a new travel demand model was developed for the City. Travel demand models are an important tool for municipalities to support forecasting and transportation planning work, such as transportation master plans, corridor planning/EA studies, and focused area analyses such as Secondary Plans, MTSA studies or traffic impact studies. This new model, called the Vaughan Travel Demand Model (VTDM), was developed as part of the Vaughan Transportation Plan.

The VTDM was based on an adaptation of the multimodal activity based GTAModel Version 4.1 created by the Travel Modelling Group at the University of Toronto. For travel demand modelling purposes, the 2006 GTA zone system is commonly used as a base for land use projections across the region. This zone system includes 142 zones within the City of Vaughan. It was further disaggregated using a one-to-many process according to Major Transit Station Area (MTSA) boundaries, arterial and major collector roads, and variations in major land use types, adding 126 zones within Vaughan, each with distinct population and employment for the 2016 base modelling year and the 2051 horizon year, totalling to the forecast shown in **Table 2-1**.

The model was customized and calibrated for the City by further customizing the zone system, adding and refining network detail, and adjusting calibration parameters to approximate more closely prevailing travel conditions within the City. While the model covers the complete Greater Toronto and Hamilton Area and will generate outputs for the whole coverage area, it has only been calibrated, and thus should only be applied, for travel to, from and within Vaughan. However, its structure could be readily adapted for more detailed subarea models and analyses, in combination with a more focused local calibration. Full details of the calibration and validation

of the model are provided as **Appendix B: Transportation Needs Assessment and Alternative Development**

Appendix C: Vaughan Travel Demand Model Calibration and Validation.

The VTDM was initially run using a 2016 network. Population and employment were synthesized for the 2051 forecast, as shown in **Figure 2-6** and **Figure 2-7**. To update the network to 2051, additional road and transit improvements were coded to build the 2051 network. These projects formed the “Do Nothing” alternative, which represents the base alternative upon which others would be formed. The improvements added were obtained from the City, York Region and provincial agencies (MTO, Metrolinx) and were filtered to identify projects with high priority and relevancy to Vaughan. These improvements are already underway or have committed implementation funding and represent a minimum future base of projects that were likely to be in place by the time horizon.

2.5.2 Existing Gap and Opportunity Identification

The first step of the needs assessment was to identify gaps in the present day, and then identify opportunities for improvements that address these gaps. This chapter describes the identification of existing gaps in the transportation network.

Gaps are disparities or deficiencies in either networks, individual infrastructure or in services provided. They can be related to different users, for different socio-demographic groups, for different modes or locations and for different trip purposes. These can arise when demand or trip characteristics for different modes are incompatible with the land use or urban structure characteristics or when they cannot be accommodated with the available transportation infrastructure. The purpose of identifying gaps is to identify subsequent opportunities for improvements that address them.

The objective of the gap analysis and prioritization phases was to:

- Determine the need and justification for new infrastructure,
- Consider gaps for all modes equally,
- Prioritize areas of greatest need,
- Accommodate future growth, and
- Create an adaptable and repeatable framework.

Network gaps were identified from a system perspective using GIS information, and many of these originated from missing connections, such as disconnected infrastructure for active transportation, a lack of direct walking routes, circuitous roads, long blocks, or an urban form built to a scale of vehicles instead of people.

Indicators for connectivity and safety gaps are shown below in **Table 2-2**, on the following page.

Table 2-2: Objectives and measures used for identifying network gaps

Objective	Mode	Measure	Measure details	Data requirements	Analysis Method
Connected (Network Reach)	Auto	Connectivity Network Completeness	Link to node ratio % of blocks with 2 N-S and 2 E-W collectors spanning block (OP requirement)	Roads GIS layer Block GIS layer	Developing heatmaps to identify connectivity "islands" and missing connections. Ranking gaps based on road network connectivity.
	Walk	Connectivity Network Completeness	Link to node ratio % of parcels that are linked to sidewalk facility	Sidewalk GIS layer Parcel GIS layer	Developing heatmaps to identify connectivity "islands" and missing connections. Ranking parcels based on access to sidewalk facility and consider dominant land use type of block.
	Cycle	Connectivity Network Completeness	Link to node ratio % of parcels that are linked to cycling facility	Cycling GIS layer AAA Cycling Network GIS layer (created from Cycling GIS layer) Parcel GIS file	Developing heatmaps to identify connectivity "islands" and missing connections. Ranking parcels based on access to cycling facility and consider dominant land use type of block.
	Transit	Transit Network Coverage	People and jobs near transit (400m walking distance from frequent bus or 800m from subway, GO, Viva)	Population and Employment by traffic zone Bus stop locations (GTFS) Sidewalk GIS layer	Identifying where service guidelines from YRT/Viva's 2016-2020 Strategic Plan are not met:[7] • 90% of residents within 500m of bus stop (Urban) • 90% of residents within 1000m bus stop (Rural) – with caveats
Safe	Auto	Road collisions	# of collisions compared to volume	Collision summaries AADTs at intersections and midblock	Ranking based on collision rates
	Walk	Pedestrian collisions	# of fatalities or seriously injured compared to volume	Collision summaries AADTs at intersections and midblock	Ranking based on collision rates
	Cycle	Cyclist collisions	# of fatalities or seriously injured compared to volume	Collision summaries AADTs at intersections and midblock	Ranking based on collision rates
	Transit	Bus collisions	# of collisions involving buses	Collision summaries and midblock AADTs at intersections	Ranking based on collision rates

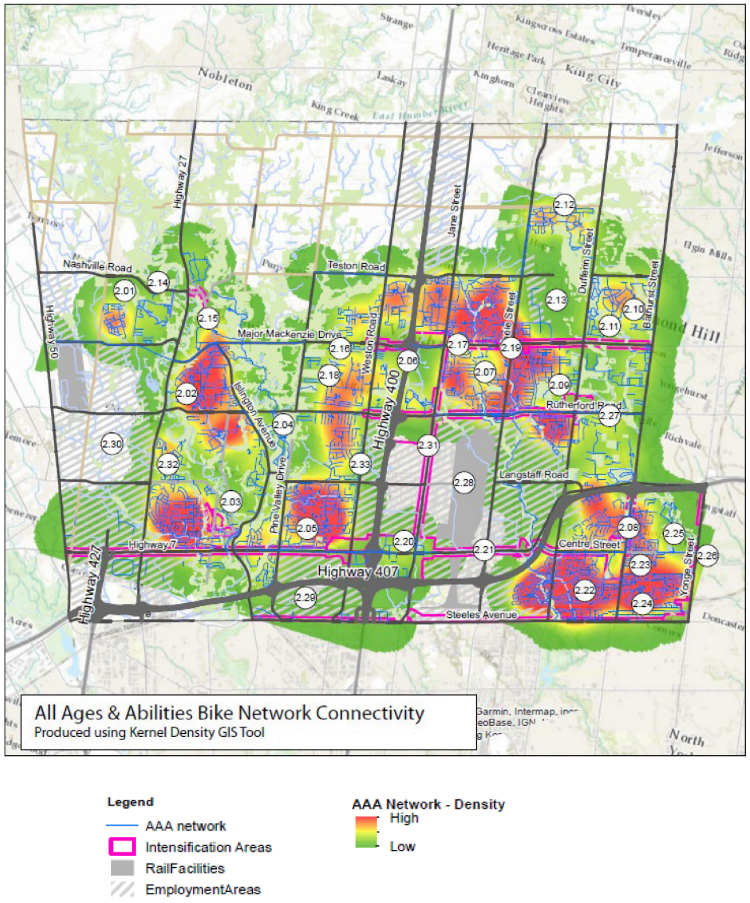
[7] York Region Transit/VIVA. (2016). Moving to 2020: YRT/VIVA 2016-2020 Strategic Plan. York Region. https://www.york.ca/media/65156/download

To identify network gaps above, a series of spatial analyses were completed using primarily GIS tools, which identified “hot spots” or areas of opportunity for improvement. The was completed for several different modes and measures, such as sidewalk network connectivity, cycling network connectivity, and transit accessibility (proximity to conventional transit stops or higher order stops. A full list is provided in **Appendix D: Long List of Existing Gaps from Needs Assessment**.

The outcome of this gap identification process was a long list of gaps, which needed to be prioritized to better understand which should be addressed first. An example of this analysis for the All Ages & Abilities (AAA) Cycling Network Connectivity is shown on the following page in **Figure 2-9**. This heatmap illustrates the density of the AAA cycling network using a colour gradient of dark green to dark red.

All Ages & Abilities (AAA) Bike Network Connectivity

A colour gradient of dark green to dark red indicates areas with low to high AAA bike network density, respectively.



Long List of Gaps

Connectivity Islands

Isolated areas where road connectivity is good, but with few connections to the rest of the City. Often, these islands are bounded by arterial roads, railways, and natural features such as watercourses.

- **2.01 – Block 61 West**
- **2.02 – Napa Valley Community** (Block 53)
- **2.03 – Woodbridge Centre** (Blocks 51 & 44)
- **2.05 – Block 37:** New Highway 7 multi-use path is the only current AAA connection to this block
- **2.08 – Thornhill:** Internal discontinuity in AAA network also evident around Promenade Mall
- **2.10 – Block 12 Northeast**
- **2.12 – Historic Community of Hope**
- **2.32 – Block 52 Southwest**

Barriers

Continuous land uses and major facilities such as the CN McMillan Yard or natural features which result in gaps and barriers between areas of road network connectivity.

- **2.04 – Kortright & Boyd Conservation Areas:** Conservation area forms barriers to east-west travel between Woodbridge and the rest of the City.
- **2.06 – Highway 400/Canada's Wonderland:** Barrier separating dense areas of AAA network connectivity to the east and west, with no mid-block crossings featuring AAA infrastructure.
- **2.13 – Keele Valley Landfill:** Closed landfill forms a barrier to east-west connectivity from Keele Street to Dufferin Street.
- **2.24 – CN York Subdivision** (Yonge-Steeles Intensification Area): Rail corridor forms a significant barrier to accessing the intensification area from denser areas of Thornhill to the northwest.
- **2.25 – Block 2:** Golf and country clubs form barriers between central Thornhill and the Langstaff intensification area.
- **2.28 – CN MacMillan Yard & Employment Areas:** Rail infrastructure and associated industrial employment areas form a significant barrier to east-west AAA connectivity north of Steeles Avenue and south of Rutherford Road.
- **2.29 – South Vaughan Employment Areas:** Industrial employment areas south of Hwy 407 and west of Dufferin Street form barriers to north-south and east-west connectivity. No continuous AAA facilities in these areas.
- **2.30 – West Vaughan Employment Areas:** Existing and future employment areas in Blocks 50, 57-60, and 64-66 form barriers to north-south and east-west connectivity. No continuous AAA facilities in these areas.

Inner Blocks

Blocks or land parcels which feature a discontinuous interior patchwork of AAA/sidewalk network routes.

- **2.07 – Historic Maple Village** (Southwest quadrant of Keele/Major Mackenzie Intersection): Discontinuity due to rural-profile roads.
- **2.09 – Dufferin/Rutherford Intersection**: Undeveloped greenspace and collector roads in the northwest quadrant form internal barriers to north-south and east-west connectivity.
- **2.18 – Block 39**
- **2.27 – Blocks 10 & 11**

Missing Connection

Individual gaps in the AAA/sidewalk network separating areas of good connectivity from one another or from intensification areas and other major trip generators.

- **2.11 – Dufferin/Major Mackenzie Intersection:** Missing AAA connection in northeast quadrant to Major Mackenzie Intensification Area due to Maple Nature Reserve barrier.
- **2.14 – Kleinburg Intensification Area:** Missing connection to Block 61 West along Nashville Road.
- **2.15 – Kleinburg Intensification Area:** Missing connection to Napa Valley Community along Islington Avenue.
- **2.16 – Jane/Major Mackenzie Intensification Area:** Missing connection from the west along Major Mackenzie Drive from Pine Valley Drive to Highway 400.
- **2.17 – Jane/Major Mackenzie Intensification Area:** Missing connection from north and south along Jane Street and east along Major Mackenzie Drive.
- **2.19 – Keele/Major Mackenzie Intensification Area**: Missing connection from all directions along Keele Street and Major Mackenzie Drive.
- **2.20 – Vaughan Metropolitan Centre Intensification Area:** Missing connection along Hwy 7 from Edgeley Blvd to Jane Street.
- **2.21 – Highway 7 Corridor:** Major arterial corridor without continuous AAA network infrastructure.
- **2.22 – Bathurst/Centre Intensification Area:** Missing north-south connections along Dufferin and Bathurst Streets.
- **2.23 – Bathurst/Centre Intensification Area:** Missing east-west connection along Centre Street.
- **2.26 – Yonge Street Corridor:** Missing north-south connections between Langstaff, Bathurst/Centre, and Yonge/Steeles intensification areas.
- **2.31 – Jane Street Corridor:** Major arterial corridor without continuous AAA network infrastructure.
- **2.33 – Weston Road Corridor:** Major arterial corridor without continuous AAA network infrastructure.

Figure 2-9: All Ages & Abilities (AAA) Cycling Network Gap Analysis

GIS analyses similar to **Figure 2-9**, were undertaken for each mode according to the measures described in **Table 2-2**. As mentioned above, these are provided in detail as **Appendix D: Long List of Existing Gaps from Needs Assessment**. Prioritization of these gaps is discussed in the following chapter.

2.5.3 Existing Prioritization of Gaps and Opportunities

To prioritize the need to address each network gap for each mode according to the objectives of the VTP, a series of prioritization indicators – quantitative measures which can be calculated using GIS software for each gap identified in the long list – were developed. The indicators are not dependent on mode, which allows for a direct comparison of the priority score across all modes. Simply put, the higher the gap score, the higher it should be prioritized (all else being equal). The calculation of scores is described in greater detail below.

The data on which the indicators are based were taken from a variety of data sources, including the 2016 Transportation Tomorrow Survey (TTS), Statistics Canada Census, and Google Maps Distance Matrix API. The indicators used in the prioritization process are listed in **Table 2-3**, below, along with data sources and descriptions where necessary. Note that collision hotspot data from the long list was used as an input to the safety prioritization indicators, rather than as a category of gaps on its own.

Table 2-3: Gap Prioritization Indicators

Category	Description of Indicators	Data Source(s)
Transportation Indicators	• **Mode-Specific Average Travel Time**: Average travel time from the gap to the nearest Primary Centre, Local Centre, or VMC, by mode. • **Mode-Specific On-Road to Straight-Line Distance Ratio:** Ratio of on-road distance divided by straight-line distance, from the gap to the nearest Primary Centre, Local Centre, or VMC, by mode. • **Presence of a 15-Minute Frequency Transit Stop:** Whether a transit stop with a 15-minute frequency exists within 400 metres of the gap.	• Google Maps Distance Matrix API • GIS data provided by York Region Transit
Land Use Indicators	• Population Density • Presence of Employment Area • Presence of Intensification Area	• Transportation Tomorrow Survey (TTS) • GIS Data (Official Plan)
Social/Equity Indicators	• Percentage of Low-Income Households • Percentage of Seniors • Percentage of Immigrant Residents • Percentage of Zero-Car Households	• Statistics Canada Census • TTS Data
Safety Indicators	• Presence of a School Zone • Presence of a Senior Care Centre • The severity of Mode-Specific Collision Hotspots	• GIS data provided by the City • Collision data provided by York Region

To provide equal weighting to all categories of indicators, a normalized scoring system was developed based on whether an indicator was discrete or continuous. **Table 2-4** shows an

example of this scoring is shown below for Gap 2.08: Thornhill (which can be cross referenced against in **Figure 2-9**).

Table 2-4: Gap prioritization example scoring calculation

Category	Indicator	Indicator Score	Category Average Score
Transportation Indicators	• Mode-Specific Average Travel Time • Mode-Specific On-Road to Straight-Line Distance Ratio • Presence of a 15-Minute Frequency Transit Stop	4 2 3	**3.0**
Land Use Indicators	• Population Density • Presence of Employment Area • Presence of Intensification Area	2 1 3	**2.0**
Social/Equity Indicators	• Percentage of Low-Income Households • Percentage of Seniors • Percentage of Immigrant Residents • Percentage of Zero-Car Households	2 2 2 2	**2.0**
Safety Indicators	• Presence of a School Zone • Presence of a Senior Care Centre • Severity of Mode-Specific Collision Hotspots	3 3 3	**3.0**

Averaging the category scores gives an overall score of **2.50** for this gap. In addition to scoring, land use considerations were accounted for through a feasibility filter. This filter looked at the context of the gap location, whether it was built-up or had significant built features that act as barriers (with low potential for changes to the road network), or whether it was a neighbourhood that had yet to be developed or in transition (with high potential for changes).

This exercise was applied for all gaps identified in the previous Chapter and prioritized based on score, then for road improvements, the feasibility filter was applied to integrate land use considerations. **Table 2-5** lists the prioritized gaps and their locations, based on the mode. Individual maps of these gaps and their location for each mode are provided in **Appendix D: Long List of Existing Gaps from Needs Assessment**.

Table 2-5: Prioritized Existing Gaps

Gap Type	Gap Location
Sidewalk	Thornhill
	Thornhill – CN York Subdivision
	Woodbridge Centre (Blocks 51 & 44)
	Jane Street Intensification Area
	Vaughan Mills Intensification Area
	Jane/Rutherford Intersection
	Steeles Avenue Intensification Area
	Steeles Avenue West – South Vaughan Employment Area
	Steeles Avenue West – Block 22
Cycling	Thornhill – Bathurst/Centre Intensification Area
	Thornhill

Gap Type	Gap Location
	Thornhill – CN York Subdivision
	Woodbridge Centre (Blocks 51 & 44)
	Between Jane and Weston, Highway 7 to Rutherford – Block 30
	Between Jane and Weston, Highway 7 to Rutherford – Block 31
	Keele/Major Mackenzie Intensification Area
Transit	Dufferin, from Langstaff to north City limits
	Langstaff, from Dufferin to west City limits
	Pine Valley, from south to north City limits
	Rutherford, from Dufferin to Bathurst
	Major Mackenzie, from Weston to west City limits
	Islington
Road	Steeles Ave W
	South Vaughan Employment Area
	Highway 400/Highway 407 Interchange Area
	West Vaughan Employment Areas
	Highway 400 Corridor
	Highway 400/Highway 407 Interchange
	Block 18 Street Design
	Dufferin / Major MacKenzie Intersection
	Pine Valley / Teston Intersection
	Keele Valley Landfill Area

Across all categories of gaps, certain corridors and areas of the City of Vaughan appear commonly as prioritized gap locations. These include the Highway 400 corridor, Thornhill, Woodbridge Centre, northeastern Vaughan, and the South Vaughan Employment Area. This indicates that infrastructure improvements in these areas of the city have the greatest potential to positively address gaps in multiple facets of Vaughan's transportation network. For instance, developing a finer-grained street network in the vicinity of Highway 400 and implementing further midblock crossings of the highway could increase active transportation network density in these areas, resolving gaps in the road, cycling, and sidewalk networks simultaneously.

2.5.4 Future Gap Identification and Prioritization

To accommodate the effects of future growth, gaps were identified and prioritized for future conditions using the results of the Vaughan Travel Demand forecasting model under the 2051 "Business-as-Usual" (BAU) scenario. Details on this scenario are further discussed in Chapter **5.2**. The results were categorized as either:

- **Further prioritizing existing gaps**, where future demand help to further prioritize existing gaps previously identified in the existing gaps prioritization step, or;
- **Identifying new gaps**, where future demand highlights new gaps which may also merit infrastructure improvements to address.

Since the prioritization indicators which underlie the existing gap prioritization process cannot be calculated under future conditions with current analytical tools, a different set of indicators was developed for each mode to identify and give priority to future gaps. Future gaps for pedestrians were not assessed individually.

A full description of these future focus and priority areas along with maps and evaluation are presented in **Appendix B: Transportation Needs Assessment and Alternative Development**.

2.5.4.1 FUTURE CYCLING NETWORK FOCUS AREAS

The VTDM does not model individual cycling network links or volumes. Since the model is disaggregated to a traffic zone level and does not feature local street networks, cycling facilities, or trails, it can be challenging to model cycling trips or volumes. Cycling network gaps were therefore identified at a network level by plotting the average travel speed of short (i.e., trips under 5 kilometres in length) auto trips originating from each traffic zone, as output by the model. Short auto trips with a low average travel speed were considered indicative of a high latent potential to convert auto trips to cycling trips, as cycling speeds can approach vehicle speeds in these areas.

These areas were identified as active transportation focus areas and were generally clustered into three main areas of the City: Southwestern Thornhill near Promenade Mall and Dufferin Street, Northeastern Vaughan near Rutherford and Maple GO stations, and the Vellore neighbourhood west of Highway 400. These are shown below in **Figure 2-10**.

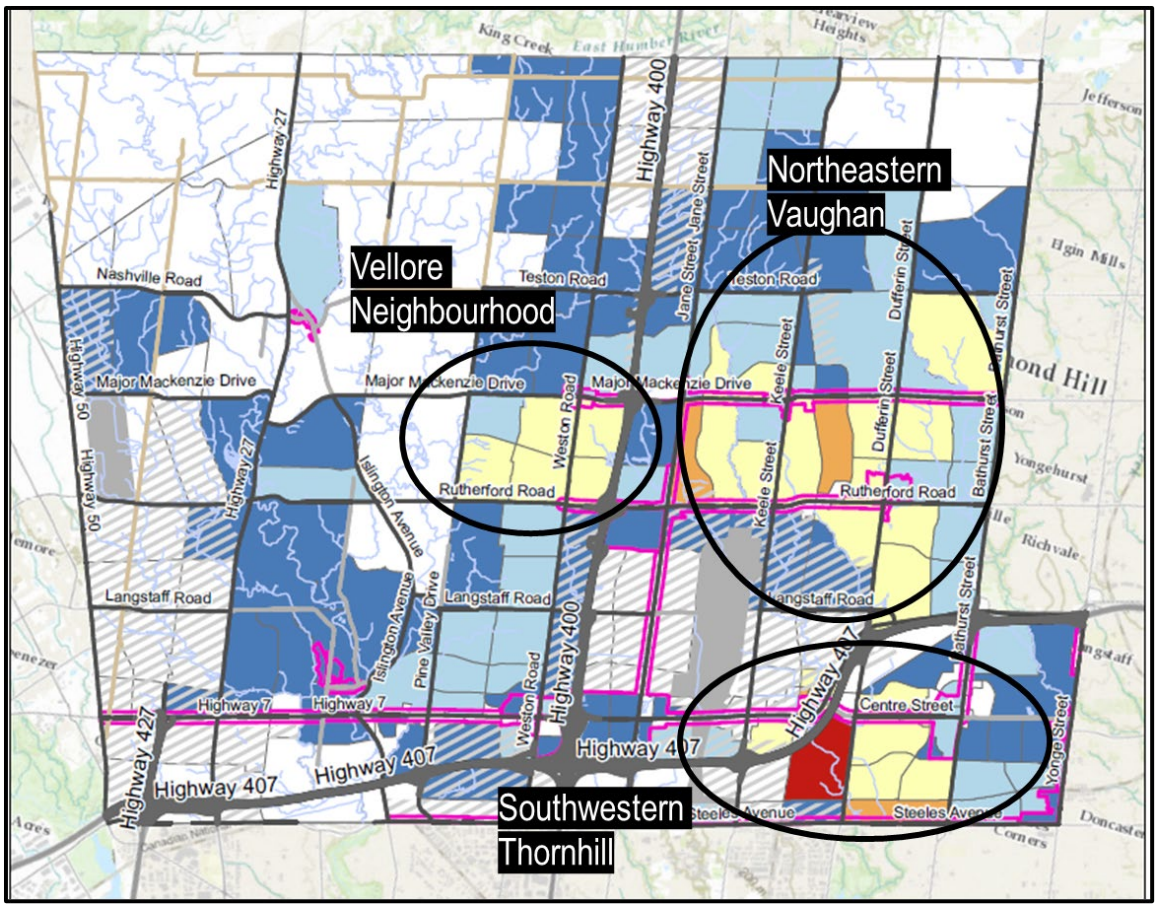


Figure 2-10: Future Cycling Network Focus Area Identification

2.5.4.2 FUTURE TRANSIT NETWORK PRIORITY AREAS

Transit gaps were identified through three main methods:

1. Assessment of capacity constraints on the future transit network using the VTDM;
2. Accessibility to employment using the future transit network, and;
3. Accessibility to the population using the future transit network.

The threshold for population and employment accessibility was 45 minutes, meaning that the measure evaluates the number of jobs or people that can be accessed *from* each zone in the City, by transit.

Table 2-6 presents these gaps, specifying if they are new or existing gaps and whether they are from lack of accessibility or capacity constraints in future modelling.

Table 2-6: Prioritized Future Transit Network Gaps based on Accessibility to Population

Prioritized Future Transit Network Gaps Location/Corridor	Description	Existing or New Gaps?
Highway 7	Capacity-constrained areas primarily in the eastbound direction from Highway 50 to Jane, both directions between Jane and Weston.	New
Jane Street	Capacity-constrained for both directions between Highway 7 and Rutherford.	New
Northeastern Vaughan	Capacity-constrained, primarily in the eastbound direction, largely between Keele and Yonge.	New
Kleinburg	Major population centre with poor employment transit accessibility.	Existing
Woodbridge Centre	Major population centre with poor employment transit accessibility.	Existing
Northeastern Vaughan	Residential blocks/corridors with poor employment transit accessibility, between Rutherford and Teston.	New
West Vaughan Employment Area	Major employment area with poor population transit accessibility.	Existing
South Vaughan Employment Area	Major employment area with poor population transit accessibility.	New
Highway 400 Corridor	Employment areas on both sides of Highway 400 with poor population transit accessibility, from Langstaff Road to north City limits.	Existing

2.5.4.3 FUTURE ROAD NETWORK PRIORITY AREAS

Road network gaps were evaluated using the travel time ratio, which is calculated by comparing the actual time on a road link compared to the free-flow time on a road link in the VTDM.

Table 2-7 summarizes future road network priority areas in Vaughan. Areas of the city that currently feature gaps and therefore have been prioritized through the existing gap analysis process continue to exhibit congestion in the future, including the West Vaughan Employment Area, Highway 400 corridor, and northeastern Vaughan.

Table 2-7: Prioritized Future Road Network Gaps

Prioritized Future Road Network Gaps Location/Corridor	Description	Existing or New Gaps?
West Vaughan Employment Area & Woodbridge	Highway 50, Highway 27, and connecting east-west roads in the West Vaughan Employment Area and Woodbridge continue to experience congestion.	Existing
Highway 400 Corridor	East-west and north-south roads near Highway 400 continue to experience congestion.	Existing

Prioritized Future Road Network Gaps Location/Corridor	Description	Existing or New Gaps?
East Vaughan	East-west and north-south roads east of Highway 400 and north of Highway 7 continue to experience congestion.	Existing

To develop cohesive transportation alternatives, the needs identified in **Chapter 2.5** must be addressed. Based on these findings, a Problem and Opportunity statement was developed and described in **Chapter 4**, and evaluation of infrastructure alternatives in **Chapter 5** along with accompanying policies to empower choice and look at alternative methods to provide transportation choices in **Chapters 5.5** and **7**. **Chapter 3** describes how the public and stakeholder engagement was undertaken throughout the VTP and leveraged to inform final recommendations.

3 Public and Stakeholder Engagement

This chapter describes the public consultation undertaken for the Vaughan Transportation Plan. Meaningful public and stakeholder engagement was a fundamental component of developing the VTP. The public and stakeholder engagement undertaken exceeds the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment (MCEA) process.

The goal of the public and stakeholder engagement process was to facilitate robust conversations on future directions for developing a longer-term plan for how residents and workers will move about the City. A key aim was to set the bar high for inspiring minds and transforming thinking about transportation choices. The engagement process significantly shaped how the VTP was developed by building a better understanding of the future of transportation and mobility which was informed by input from the public and stakeholders on key aspects of the plan including alternative transportation solutions, policy directions and implementation framework. For full details of the public and stakeholder engagement during the VTP, including notices, presentation material, meeting notes and correspondence with the public, please refer to

Appendix E: Public and Stakeholder Consultation.

Public and stakeholder consultation was organized in three phases and was guided by a communications and public engagement plan. Engagement methods were adapted in April 2020 to pivot to virtual methods in response to the COVID-19 pandemic. In-person methods were utilized for Phase 1 engagements prior to this date, and virtual methods were utilized for Phases 2 and 3. While the method for delivering the engagement process changed, the commitment to effective public and stakeholder engagement remained the same, with the following material presented in each phase:

- In Phase 1 of the VTP study, the project team undertook background studies, identified opportunities and challenges, and developed goals for the Plan.
- In Phase 2 of the VTP study, the project team presented a Problem and Opportunity Statement and explored four Alternative Solutions for the transportation network that identified projects which will provide more ways to travel and get you where you need to go.
- In Phase 3 of the VTP study, the project team presented and sought public and stakeholder input on a Draft Preferred Alternative, Implementation Plan and Policy Directions.

Documentation of public and stakeholder input and how it was reflected in the evolution of the development of the VTP includes summaries for Pop-Up workshops, detailed Public Open House Feedback Reports and summaries of stakeholder meeting discussions. Common themes and key messages were reported on in successive engagement activities and reports were posted on the project website.

The communications and public engagement that was undertaken for the VTP were guided by the following principles in **Table 3-1**.

Table 3-1: Engagement Principles and Application for VTP study

Engagement Principle	Method in which the Engagement Principle was applied for the VTP
Inclusivity	• Engaging residents and stakeholders with a range of views and perspectives. • Reducing barriers to engagement by offering many different opportunities to connect. • Going out to where people are already gathering to foster more opportunities for receiving input. • Using techniques that support different ways of learning and participating.
Relevancy	• Being clear on the purpose of the engagement and scope of work being considered. • Framing issues for productive discussion. • The right level of information for the conversation.
Respect	• Creating an experience that values people's time and respects different viewpoints. • Dealing with apathy, conflict and outrage. • Responding in a timely and professional manner.
Effective communication	• Developing a unique visual identity and project branding to build awareness. • Using visual engagement to inform and educate.
Transparency	• More than feedback reports – documenting what was heard and demonstrating how input was used/reflected in the development of the VTP. • Sharing key themes and messages on the website and in meetings and activities.
Continuous improvement	• Adapting approaches and techniques to get the most out of the engagement. • Adjusting schedule and timing of activities to maximize involvement.

The engagement process was aligned with the principles and values of the International Association of Public Participation (IAP2) and was compliant with the Accessibility for Ontarians with Disabilities Act (AODA) and City of Vaughan Accessibility Guidelines.

Given the significance of other ongoing City initiatives, alignment of communication and engagement with these other projects where feasible and appropriate was undertaken including the following:

- Utilizing contact lists from recent and related projects to provide notification to stakeholders about the VTP and to update those that had been involved in other studies of the work for the VTP.
- Drawing on information learned from other studies and reviewing this as part of the analysis for the VTP. For example, the Pedestrian and Bicycle Master Plan (PBMP) Update was incorporated into the VTP and included in stakeholder discussions.
- Avoiding duplication of recent consultation efforts undertaken as part of the PBMP, Traffic Management Strategy and other studies – ensuring that new questions were posed in community surveys, pop-up workshops and stakeholder meetings and striving to explain how other City initiatives fit with the VTP to achieve broader City goals and vision.
- Hosting pop-up kiosks at the same time as other City events (e.g., City of Vaughan Winterfest and 2020 Vaughan Business Expo).

3.1 Public Process Objectives

The goal of the public engagement process was to inspire minds and transform thinking about transportation choices. With the importance of understanding the existing transportation environment and identifying where transformation could occur in how people travel in Vaughan, coupled with the unique aspects of accommodating growth and shifting to more sustainable travel modes, a number of important public process objectives were developed. The following objectives guided the communications and public engagement throughout the study:

1. To create City-wide interest in the Vaughan Transportation Plan.
2. To reach diverse groups and needs by engaging different stakeholders differently.
3. To personalize the VTP – explaining why this plan matters by connecting information to what is the impact for each person.
4. To mobilize residents and stakeholders to take more ownership – e.g. This is “my Vaughan” – What steps can I take to make transportation more sustainable?
5. To educate the community on opportunities, transportation programs and pilots through information shared at Public Open Houses, through Kitchen Table Guides, and at Stakeholder workshops and presentations.
6. To provide appropriate platforms for public input and facilitating meetings in order to ensure that all viewpoints can be expressed in an open and friendly environment.
7. To keep people engaged by sustaining levels of input and collaboration over the entire work plan timeline – working with staff and stakeholders, being cognizant of the demands of many different projects and priorities.
8. To create a climate for channelling what often becomes negative venting into constructive input about the transportation system and future ideas.
9. To address perceptions that input doesn’t matter by showing how input has been reflected throughout the VTP.
10. To place less emphasis on the quantity of input and more on quality. While social media stats and analytics on attendance at public events are important, these need to be considered in the context of how people were able to contribute and the extent of that contribution and not on the number of participants alone.

3.2 Public Engagement and Communication Activities

The communication and public engagement efforts used different formats and tools to share information and garner input from the community. **Figure 3-1** provides an overview of the public engagement methods and tools used.

Phase 1 Consultation:
Background, Opportunities, Challenges and Plan Goals

Project Set-up
- Develop project website.
- Set up dedicated project email address.
- Email update and invitation to participate to all registered neighbourhood associations and community associations.
- Email update and invitation to participate to Indigenous Communities.

Vaughan Winterfest Pop-up Workshops
February 9, 2020
Vellore Village Community Centre

Vaughan Business Expo Pop-up Workshops
February 11, 2020
Terrace Banquet Centre

Community Survey
April 13, 2020, to May 11, 2020
City-wide community survey available on the VTP project website

Phase 2 Consultation:
Problem and Opportunity Statement, Alternative Solutions

Stakeholder Workshop Meetings #1
- Builders and Developers (*December 8, 2020)*
- Major Employers and Businesses *(February 9, 2021)*
- Goods movement and Logistics Businesses, Major Chains and Retailers *(February 11, 2021)*

Presentation to City of Vaughan Older Adult Task Force
October 25, 2021
Online Meeting

Virtual Public Open House #1
- Online Materials for viewing (*November 18, 2021, to December 9, 2021)*
- Live Virtual Presentation and Discussion (*November 23, 2021)*

Self-Guided Kitchen Table Guide for all Neighbourhood Associations
November 2021 to January 2022
Downloadable tool for Input

Phase 3 Consultation:
Draft Preferred Alternative Solutions

Virtual Public Open House #2
- Online Materials for viewing (*April 5, 2022, to April 29, 2022)*
- Live Virtual Presentation and Discussion (*April 19, 2022)*

Stakeholder Workshop Meetings #2
- Cycling Advocates *(April 27, 2022)*
- Goods movement and logistics Businesses, Major Chains and Retailers *(May 19, 2022)*
- Major Employers and Businesses *(May 25, 2022)*
- Builders and Developers *(May 26, 2022)*

Figure 3-1: Public Consultation and Engagement Activities undertaken during the VTP

3.3 Audiences for Public Engagement: Who was Consulted?

Public engagement efforts were focused on creating awareness of the VTP across Vaughan and included the audiences and stakeholders presented in **Table 3-2**.

Table 3-2: Audiences Consulted for the VTP

Audience (who was consulted)	Engagement Method(s)
General Public (Residents throughout the City including drivers, pedestrians, cyclists, and transit users)	Website Social Media Community Survey Pop-up Kiosk at City of Vaughan Winterfest (February 2020) Virtual Public Open Houses #1 (November 2021) Virtual Public Open House #2 (April 2022)
Neighbourhood Associations	Kitchen Table Guide (downloadable tool for input) Invitation to Virtual Public Open Houses #1 (November 2021) Invitation to Virtual Public Open House #2 (April 2022)
Older Adult Task Force	Presentation at Task Force Meeting (October 2021)
Active transportation/cycling organizations	Virtual Stakeholder Workshop including presentation and discussion (April 2022) Invitation to Virtual Public Open Houses #1 (November 2021) Invitation to Virtual Public Open House #2 (April 2022)
Builders and Development Industry	Two rounds of Virtual Stakeholder Meetings held in December 2020 and May 2022 Invitation to Virtual Public Open Houses #1 (November 2021) Invitation to Virtual Public Open House #2 (April 2022)
Major Employers and Businesses	Pop-up workshop held at the 2020 Business Expo 2020 (February 2020) Two rounds of Virtual Stakeholder Meetings held in February 2020 and May 2022 Invitation to Virtual Public Open Houses #1 (November 2021) Invitation to Virtual Public Open House #2 (April 2022)
Goods Movement	Two rounds of Virtual Stakeholder Meetings held in February 2020 and May 2022 Invitation to Virtual Public Open Houses #1 (November 2021) Invitation to Virtual Public Open House #2 (April 2022)
Indigenous Communities	Notice of Commencement (February 2020) Notice of Public Open House #2 (April 2022)
Agencies and Approval Authorities	Inclusion in the External Technical Advisory Committee: • Toronto Regional Conservation Authority • Ministry of the Environment, Conservation and Parks • Ministry of Transportation for Ontario • Metrolinx • York Region • York Region Transit • Region of Peel • City of Brampton • City of Markham • City of Richmond Hill • City of Toronto • Toronto Transit Commission
Internal City departments	Inclusion in Internal Technical Advisory Committee: • Corporate and Strategic Communications

Audience (who was consulted)	Engagement Method(s)
	• Infrastructure Planning and Corporate Asset Management • Development Engineering • Infrastructure Delivery • Parks Infrastructure Planning and Development • Development Planning • Policy Planning and Special Programs • Vaughan Metropolitan Centre (VMC) Program • Transportation and Fleet Management Services

It should also be noted that Youth engagement was proposed to be undertaken in 2020 and early 2021. Meetings were held with the York Region District School Board and York Catholic District School Board with respect to providing a self-guided workbook for use in classrooms. The *Advise Your Council* series was developed and efforts to pilot its use in classrooms through Grades 7 to 10 in each City Ward were undertaken. Given the ongoing class disruptions and remote learning due to the Covid-19 pandemic, it was not feasible to hold the youth engagement.

3.4 Public Consultation Activities Undertaken by phase

Public and Stakeholder Engagement activities were organized in three phases. The following subsections provide an overview of the public consultation activities undertaken in each phase.

3.4.1 Phase 1: Project Commencement and Key Findings Analysis

In Phase 1 of the VTP study, the project team undertook background studies, identified opportunities and challenges, and developed goals for the Plan. Consultation during this phase promoted awareness of the VTP and sought input on travel behaviours and ideas for improving travel choices within Vaughan. The consultation activities were undertaken from February 2019 to November 2020.

3.4.1.1 VAUGHAN TRANSPORTATION PLAN PAGE ON THE CITY OF VAUGHAN WEBSITE

A project page was developed for the VTP as a central place for information that provided information about the project, how to get involved and resources. The webpage included links to key relevant City documents, including the link for the Community Survey, notices for Public Open Houses, Public Open House Feedback Reports, Summaries of Stakeholder meetings and videos of the live presentations from POH#1 and POH#2.

3.4.1.2 DEDICATED VAUGHAN TRANSPORTATION PLAN EMAIL

A dedicated email address was established for the VTP project to provide a singular point of contact for residents to provide input. Emails were reviewed, responded to, and considered by the project team.

3.4.1.3 INDIGENOUS COMMUNITIES ENGAGEMENT

The City of Vaughan's engagement and consultation process with Indigenous communities was undertaken with the Alderville First Nation, Curve Lake First Nation, Hiawatha First Nation, Huron-Wendat First Nation, Mississaugas of Scugog Island and Mississaugas of Credit First Nation with an email with a PDF attachment of the Notice of Commencement on February 26,

2020, and with an email with a PDF attachment of Public Open House #2 on April 6, 2022. The following were noted:

- A response was received from the Huron-Wendat Nation during Phase 1 consultation inquiring on whether archaeological study would be undertaken during the VTP. The project team informed the Huron-Wendat Nation that archaeological study would not be undertaken and provided additional detail on next steps as the VTP progressed.
- Alderville First Nation indicated that they did not have an interest in Vaughan (as Vaughan is within the Toronto Purchase) and were not sent the notice for Public Open House #2.

3.4.1.4 POP-UP WORKSHOPS

Two pop-up workshops were held as follows:

- At the City of Vaughan Winterfest on Saturday, February 9, 2020, from 9 a.m. to 3 p.m. at the Vellore Village Community Centre.
- At the Vaughan Business Expo on February 11, 2020, from 8:00 a.m. to 3:00 p.m. at the Terrace Banquet Centre.

The pop-up workshops promoted awareness of the VTP and sought input on travel behaviours and ideas for improving travel choices within Vaughan. By presenting materials at these two events in locations where the public was already gathering, the Project team was able to have conversations with approximately 225 individuals.

The display used at the Pop-up Kiosks is shown in **Figure 3-2**, below. It consisted of a 3-panel board that provided information about existing and anticipated future travel patterns in the City and visual images of innovative ideas that could be considered for improving travel choices by all modes. Two questions were used to prompt input as follows:

- What is important to you when choosing how to travel? Convenience, Cost, Time, Other?
- What about travelling in Vaughan would you improve?

Figure 3-2: Pop-up Kiosk Display

Participants were encouraged to write an idea or concern on a post-it note and place it on the display. Project team members were available to share information about the study and to discuss ideas with community members. Postcards were distributed with the project website, email address and promotion for the Community survey.

Five common themes from the feedback at the Pop-up workshop at Winterfest were heard:

- Improving transit with increased frequency, reliability, more convenient bus stop locations, better integration with other modes, and overall ease of use of and convenience of the system.
- Addressing traffic congestion with frustration noted about congestion and delays associated with bottlenecks in the existing traffic network and with recurring construction projects.
- A desire to bike more with the hope that Vaughan will provide expanded and safer bike infrastructure.
- Improving walking conditions with more focus on pedestrian-friendly streets.
- Ideas about future innovations that could make a difference, including opinions about relatively new, or net-yet available services and technologies.

There were many ideas expressed for ways to improve transit, the road network, cycling, walking and innovation which were considered by the project team.

Common themes were heard at the 2020 Vaughan Business Expo:

- Improvements are needed to improve travel along arterial roads and at intersections.
- Goods movement considerations need to be better accommodated in transportation planning.
- Transit infrastructure improvement in Vaughan is promising.
- Would like to see more improvement to active transportation.

3.4.1.5 COMMUNITY SURVEY

From April 13, 2020, to May 11, 2020, a City-wide community survey was available on the VTP project website. 423 people participated in the survey. The survey included questions aimed at learning about values and preferences to inform discussions about shifting travel patterns and what is important about different travel choices. Each question posed included statements where the respondent was asked to indicate how they consider the listed statements for each mode by either disagree, not sure or agree or not applicable. Survey questions and responses are included in **Table 3-3**, below.

Table 3-3: Community Survey Questions and Responses

Community Survey Questions and Responses
How do you feel about driving, about transit, about cycling, about walking? • How do you feel about driving (60% agree driving gets me to where I want to go), is reliable (70%), is straightforward (70%), is safe (55%), is expensive (70%). • How do you feel about transit (20% agree that transit gets me to where I want to go), is reliable (25%), is straightforward (40%), is safe (70%), is expensive (50%). • How do you feel about cycling (10% agree that cycling gets me to where I want to go), is reliable (28%), is straightforward (38%), is safe (7%). • How do you feel about walking (28% agree that walking gets me to where I want to go), is safe (62%)
How do you feel about parking? • Free parking is important (85% agreed) • There isn't enough parking (75% agreed) • If free parking wasn't provided at my destination i.e., work, I would change the way I get there (45% agreed) • I believe on street parking could be better used for other things like wider sidewalks, patios or bike lanes (45% agreed)
How likely are you to use other modes to travel? • How likely are you to bike to a transit stop if bike share is available (60% indicated unlikely) • Take an Uber or Lyft to a bus or subway stop (55 % indicated unlikely) • Use an electric scooter or bike for short trips? (50% indicated unlikely) • Take transit if you could order a bus on our phone to pick you up from a desired location? (60% indicated likely)
How do you feel about travel information and payment? • I want more ways to pay (70% agreed) • Knowing when the next bus is coming is important (80% agreed) • I would plan my daily trip on a phone app if it was reliable and easy to use (75% agreed) • I would walk, bike or take transit to work if my employer provided incentives to leave my car at home (65% agreed)
How do you feel about the following statements? • Transportation influenced where I chose to live (over 50% agreed) • Transportation influenced where I chose to work (over 50% agreed) • Owning a car is important (80% agreed) • I like being the driver (60%) I like being the passenger (40%) • I prefer saving time (65%) I prefer saving money (35%) • Given the choice, I prefer to buy online and get it delivered (55%) vs. go to the store and get it myself (45%) • Getting around the City, I enjoy the following the most: Being the driver (40%), Listening to music, reading while travelling (30%), Getting some exercise (20%), Getting work done (10%) • When new technology comes out, I buy it right away (10%), I buy new when my stuff breaks (60%), it is no concern of mine (30%)

Community Survey Questions and Responses
How people move about the City currently and in the future. • Currently, I move around the City by: Public transit (40%), Walking (40%), Bike or scooter (7%), Gas vehicle (85%), Hybrid or electric vehicle (5%). • In 10 years, I would like to move more by public transit (65%), walking (44%), bike or scooter (18%), ride/car share (8%), gas vehicle (29%), hybrid vehicle (47%), driverless vehicle (24%) • My transportation choices are influenced by time (80%), cost/affordability (56%), available options (38%), physical accessibility (9%), comfort and safety (32%), reliability (45%), environmental footprint (8%)

The survey input was analyzed by the project team and used to inform the Problem and Opportunity Statement, Project Goals, and consideration for the development of alternative solutions. Results from the survey were also used to inform materials for Phase 2 consultation activities.

3.4.2 Phase 2: Problem and Opportunity, Draft Alternatives and Evaluation Criteria

In Phase 2 of the VTP study, the project team presented a Problem and Opportunity Statement and explored four Alternative Solutions for the transportation network that identified projects which will provide more ways to travel and get where you need to go. Public input was sought on the Problem and Opportunity, Draft Alternatives and Evaluation Criteria in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment.

Consultation with the public and key stakeholders was undertaken in Phase 2 from December 2020 to November 2021 and included the following:

- Stakeholder workshop meeting #1 with:
  - Builders and Developers on December 8, 2020
  - Major Employers and Businesses on February 9, 2021
  - Goods Movement and Logistic Businesses, Major Chains and Retailers on February 11, 2021
- Presentation to the City of Vaughan Older Adult Task Force on October 25, 2021.
- Public Open House #1 with online materials available for review and comment from November 18, 2021, to December 9, 2021.
- Live Virtual Presentation and Discussion (webinar) on November 23, 2021.
- Emailing of self-guided Kitchen Table Guide to all Neighbourhood Associations, November 2021 to January 2022.

The following subsections describe how the consultation events took place, the materials used, and the formats used to share information and receive feedback. Detailed feedback reports on what was heard were prepared for each activity and posted on the VTP project website.

3.4.2.1 STAKEHOLDER WORKSHOP MEETINGS

Three stakeholder workshops were by invitation and hosted virtually on December 8, 2020, February 9, and February 11, 2021. RSVPs were requested and information on how to join the meeting via WebEx was provided in advance. The purpose of these sessions was to hear about experiences and input from these key stakeholders to directly inform the City's policy direction and guidelines for future transportation infrastructure and programs. The meetings included a

short background presentation followed by a facilitated discussion on the exchange of ideas, opportunities and hurdles and supports for shaping the VTP. 37 individuals participated in the three virtual stakeholder workshop meetings. The purpose and topics discussed at each workshop are summarized in **Table 3-4**.

Table 3-4: Stakeholder Workshops, Purpose and Key Topics

Date Held	Audience and Purpose of Workshop
December 8, 2020 **9:30 to 11:00 a.m.** **Attended by 16 Builder and Development representatives.**	**Development Industry and Property Managers** • To discuss opportunities and barriers/hurdles to advancing sustainable modes in new and existing development. • To collectively identify policy directions to inform the VTP • To identify key drivers from the developer's perspective to support City's goals: 1. Support transit 2. Encourage active transportation, enhance the public realm, and provide a mix of uses 3. Reduce parking requirements 4. Support goods movement and new freight delivery models 5. Leverage new mobility technologies To collect inputs to inform the City's direction and guidelines for the Transportation Plan.
February 9, 2021 **1:30 to 3:00 p.m.** **Attended by 12 major Employers and Business representatives.**	**Major Employers and Businesses** • To discuss opportunities and barriers/hurdles to encouraging the use of sustainable modes for employers and employees. • To collectively identify policy directions to inform the City's Transportation Plan. • To highlight key insights from an employer's perspective that align with City goals. • To collectively identify policy gaps and actions to consider in the City's Transportation Plan. • To discuss how remote working haschanged.
February 11, 2021 **1:00 p.m. To 2:30 p.m.** **Attended by 9 Goods Movement representatives.**	**Goods Movement and Logistic Businesses, Major Chains and Retailers** • To discuss opportunities and ideas to ensure goods movement can operate efficiently and sustainably within Vaughan. To identify the barriers or hurdles to get there. • To collectively identify policy directions to inform the City's Transportation Plan • To highlight key insights from a goods movement perspective that align with City goals • To discuss suggestions on the overall transportation network solution that would improve transportation access to workplaces.

3.4.2.2 OLDER ADULT TASK FORCE MEETING

As part of the outreach and consultation for the VTP, the Project Team made a presentation to the City of Vaughan Older Adult Task Force on October 25, 2021. The meeting was attended by 17 individuals including 5 Committee members, the City's Age-Friendly Action Plan Consultant and Staff from the City and York Region.

The purpose of the workshop was to:

- Share information on the key findings and directions for the VTP.

- Highlight key insights from an older adult perspective that align with City goals.
- Collectively, discuss policy gaps and actions to consider in the City's Transportation Plan.

The presentation included the following:

- Overview of the purpose of the VTP, goals and vision for the plan, and what we have learned so far throughout the consultations – noting key messages.
- Key transportation themes highlighted from the City of Vaughan Age-Friendly Community Action Plan.
- Examples and transportation sustainability ideas for how to get there - ideas to start the discussion on how the City can get there

Following the presentation, the discussion was facilitated on the following:

- What are the opportunities and what are the barriers/hurdles to creating a transportation system that is designed for all ages and abilities?
- What does an age-friendly community mean to you?
- What are the important destinations to you?
- What additional choices do you want to see for transportation?
- Would you be interested in trying new technologies like a driverless shuttle?

The following key themes were noted:

- Lack of access and comfortable connections to transit is a significant barrier to using public transportation.
- It's important to create a transportation system for everyone to provide seniors with the independence to be part of the community.
- More work is needed when considering opportunities and challenges for seniors for active transportation.
- The affordability of transit for seniors is a barrier.

3.4.2.3 KITCHEN TABLE GUIDES FOR NEIGHBOURHOOD ASSOCIATIONS

To foster input from the City's Neighbourhood Associations, A Kitchen Table Guide was distributed by email. Kitchen Table Guides are a structured way of participating in a conversation about an important issue amongst neighbours and members of a neighbourhood association. The guide included key information about the VTP and asked questions about transportation experiences and ideas for improvement. It included information on how to hold the discussion and a feedback form that could be completed and returned to the City. Five feedback forms were completed and returned to the City. These identified specific transportation challenges in various areas within the City and provided opinions on ways of improving walking, cycling and transit. One Neighbourhood Association meeting was facilitated by City staff. Feedback from the Kitchen Table Guides was summarized and considered by the project team.

3.4.2.4 PUBLIC OPEN HOUSE #1

The first virtual open House took place in November 2021. The consultation took place virtually. Community members were able to participate in two ways as follows:

1. By visiting the Project Website anytime between Thursday, Nov. 18, 2021, to Thursday, Dec. 9, 2021, to view online materials and to provide input directly through the site.

Materials were available 24 hours a day, 7 days a week. Participants could also forward comments to the City's Project Manager by email.

2. By attending the live Virtual Presentation and Discussion held on Tuesday, Nov. 23, 2021, from 7:00 to 8:30 p.m. The meeting was held as a webinar and residents registered in advance of the session. The format included a presentation and question and answer session with the project team. The presentation recording was posted on the project website for viewing following the meeting.

From November 18 to December 9, the website was visited 534 times and 17 individuals responded by providing their views on the online open house materials. 19 registrant connections participated in the live community meeting. Public input was documented in a detailed Feedback Report which included responses to questions asked in the online meeting materials and questions and responses to individual comments through the live presentation and discussion.

Information provided through the Public Open House #1 online materials is presented in **Table 3-5**.

Table 3-5: Public Open House #1 Online Meeting Materials

Topic	Information Presented
Introduction	Goals Objectives Study Process and Timeline
Updated and Related Plans	List of Regional and Provincial Policies and Plans 2012 Vaughan Transportation Plan Updates since the 2012 Transportation Master Plan
Vaughan's Infrastructure	Community Members could click on maps to view maps of the following to better understand the characteristics of the study area: • Pedestrian Network • Cycling Network • Vehicle Network • Rapid Transit Network
What we've learned so far	Overview of Consultation Activities completed Key Messages heard for Walking, Cycling, Transit and Driving
Problem and Opportunity Statement	Noting that the VTP is a long-term blueprint to move people and goods safely, efficiently and sustainably, supporting current and future residents, businesses and visitors. Description of opportunities to improve the City's transportation system. *Feedback Question:* Tell us your Transportation Story
Proposed Solutions	Four alternative solutions were presented as follows: • Business as Usual (BAU) • Alternative 1 – New Roads Alternative • Alternative 2 – Green Alternative • Alternative 3 – Multi-Modal Alternative Community Members could click on maps to view transportation improvements for each alternative solution. *Feedback Questions:* • From a scale of 1 to 5, how satisfied are you with this alternative • Please explain why you chose this ranking
Evaluation Criteria	Evaluation criteria that will be used to evaluate the alternative solutions *Feedback Questions:*

Topic	Information Presented
	• Do these criteria reflect what is important to you? Please rate the evaluation criteria • Please explain why you chose that ranking.
Next Steps	Overview of Next Steps *Feedback Question:* • Please enter any additional comments or questions you have about the project

3.4.2.5 PHASE 3 PREFERRED TRANSPORTATION SOLUTIONS, IMPLEMENTATION PLAN AND POLICY DIRECTIONS

In Phase 3 of the VTP study, the project team presented and sought public and stakeholder input on a Draft Preferred Alternative, Implementation Plan and Policy Directions in accordance with the requirements of Phases 1 and 2 of the Municipal Class Environmental Assessment. Consultation with the public and key stakeholders was undertaken in Phase 3 during April and May 2022. At each event, the project team presented key findings, overviewed the preferred transportation solutions, implementation plan and policy directions and sought feedback on what future programs and infrastructure should be prioritized.

Consultation undertaken as part of Phase 3 included the following:

- Public Open House #2 with online materials available for review and comment from April 5 to April 29, 2022.
- Live Virtual Presentation and Discussion (webinar) on April 19, 2022.
- Stakeholder workshop meeting with:
    - Cycling Advocates on April 27, 2022
    - Goods Movement and Logistic Businesses, Major Chains and Retailers on May 19, 2022
    - Major Employers and Businesses on May 25, 2022
    - Builders and Developers on May 26, 2022.

The following describes how the consultation events took place, the materials used, and the formats used to share information and receive feedback. Detailed feedback reports on what was heard were prepared for each activity and posted on the VTP project website.

3.4.2.6 PUBLIC OPEN HOUSE #2

The final virtual Public Open House took place in April 2022. The consultation took place virtually. Community members were able to participate in two ways as follows:

1. By visiting the Project Website anytime between Tuesday, April 5, 2022, to Friday, April 29, 2022, to view online materials and to provide input directly through the site. Materials were available 24 hours a day, 7 days a week. Participants could also forward comments to the City's Project Manager by email.
2. By attending the live Virtual Presentation and Discussion held on Tuesday, April 19, 2022, from 7:00 to 8:30 p.m. The meeting was held as a webinar and residents registered in advance of the session. The format included a presentation and question and answer session with the project team. The presentation recording was posted on the project website for viewing following the meeting.

From April 5 to April 29, the website was visited by 129 users and 33 individuals responded by providing their views on the online open house materials. 19 registrant connections participated in the live virtual presentation and discussion. Public input was documented in a detailed Feedback Report which included responses to questions asked in the online meeting materials and questions and responses to individual comments through the live presentation and discussion.

Information provided through the Public Open House #2 online materials is presented in **Table 3-6**.

Table 3-6: Public Open House #2 Online Meeting Materials

Topics	Information Included
Introduction	Goals Study Process and Timeline including Project Tasks and Consultation and Engagement
Problem and Opportunity Statement	Noting that the VTP is a long-term blueprint to move people and goods safely, efficiently, and sustainably, supporting current and future residents, businesses and visitors. Description of opportunities to improve the City's transportation
Alternatives and Evaluation Criteria	Description of the four Alternative Solutions presented in Phase 1: • Business as Usual (BAU) • Alternative 1 – New Roads Alternative • Alternative 2 – Green Alternative • Alternative 3 – Multi-Modal Alternative Evaluation criteria and results used to evaluate the alternative solutions include: • Accessibility and Connectivity • Environmental Stewardship • Equity • Financial Sustainability • Reliability and Resilience • Safety
What we've learned so far	Overview of Consultation Activities completed What we have learned since Public Open House #1 Key messages heard from the public on the themes of: • Build Infrastructure • Change Culture • Think Forward
Transportation Network Recommendations	• Description of the recommended transportation network solution – Alternative 3: Multi-Modal. • Community Members could click on maps to view maps of the following to better to view the transportation network recommendations for the study area including the following: Multi-Modal Alternative Improvements, Grade Separated Rail Crossing, Road Improvements, Transit Service Improvements, Interchange Improvements, and GO Rail. Planned Highway Extensions by Others, Existing Road Network, and Active Transportation Priority Areas. • Description of how Alternative 3: Multi-Modal meets the goals of the Plan. • Description of how the Transportation Network Recommendations can improve residents' and visitors' travel. • Implementation Plan. • *Feedback question: How satisfied are you with Alternative 3: Multi-Modal as the recommended alternative? Please explain why you chose this ranking*
Policy Recommendations	Description of key policy recommendations including: • Transportation Infrastructure Resiliency • Support for 15-minute Neighbourhoods

Topics	Information Included
	• Maximize Transportation Infrastructure Value • Goods Movement • Future Mobility • Data Collection • *Feedback question: How important are each of the policy recommendations to you and are there other policies that should be considered? Please explain why you chose this ranking.*
Next Steps	• Overview of Next Steps • *Feedback Question: Please enter any additional comments or questions you have about the project*

3.4.3 Stakeholder Workshop Meetings

To seek feedback on the Draft Preferred Alternative, Implementation and Policy Directions, Stakeholder Workshop Meetings were held with Cycling Advocates, Goods Movement, Major Chains and Retailers, Major Employers and Businesses, and Builders and Development Industry. With the exception of the Cycling representatives, this was the second round of meetings with stakeholders building on the input received in Phase 2. The four stakeholder meetings were by invitation and hosted virtually. RSVPs were requested and information on how to join the meeting via WebEx was provided in advance. The meetings included a short background presentation followed by a facilitated discussion. 26 individuals participated in the virtual stakeholder workshop meetings. The purpose and topics discussed at each workshop are summarized in **Table 3-7**.

Table 3-7: Stakeholder Workshop Purpose and Key Topic

Date Held	Audience and Purpose of Workshop
April 27, 2022 **6:30 to 8:00 p.m.** **Attended by 2 cycling Organization representatives.**	**Cycling Advocates** • To share information on the direction of the Vaughan Transportation Plan and how it builds on the City's Pedestrian and Bicycle Master Plan • To provide an overview of the preferred alternative and recommendations • To collectively discuss cycling-related policy gaps and actions to consider in the Plan **Discussion Questions included:** • How satisfied are you with Alternative 3: MultiModal as the recommended alternative? Does this reflect the importance of cycling in Vaughan? • What things we can do to encourage more cycling in Vaughan? i.e., considering both infrastructure and events/programs/education etc. • Do you have any other suggestions about the implementation or policy recommendations that you feel could improve travel in Vaughan?
May 19, 2022 **3:00 to 4:30 p.m.** **Attended by 7 Goods Movement representatives.**	**Goods Movement Businesses, Major Chains and Retailers** • To provide an update on the VTP • To provide an overview of the preferred alternative and recommendations • To collectively discuss goods movement policy recommendations and actions to consider in the Plan. **Discussion Questions included:**

Date Held	Audience and Purpose of Workshop
	• Do you have any comments or suggestions on the overall transportation network solution that would improve goods movement in Vaughan? • A key policy recommendation is articulating a Goods Movement Strategy. A number of components were referenced in the presentation. • Are there other components that should be considered? • What advice do you have for the City for developing this strategy? • How can the City coordinate this work with Goods Movement and Logistics stakeholders? • Do you have any other suggestions about the Vaughan Transportation Plan that you feel could improve goods movement practices in Vaughan?
May 25, 2022 **2:00 to 3:30 p.m.** **Attended by 7 major Employers and Business representatives.**	**Major Employers and Businesses** • To provide an update on the VTP • To provide an overview of the preferred alternative and recommendations • To collectively discuss policies and considerations for implementing sustainable travel options to and from employment and business destinations and actions to consider in the Plan. **Discussion Questions included:** • Do you have any comments or suggestions on the overall transportation network solution that would improve transportation access to workplaces in Vaughan? • What are your organization's current plans for returning to work? • For transportation policies • How can the City make working from home more attractive to employees? • What can we do to encourage greater uptake of sustainable travel to work?
May 26, 2022 **9:30 to 11:00 a.m.** **Attended by 10 builder and Development representatives.**	**Builders and Development Representatives** • To provide an update on the VTP • To provide an overview of the preferred alternative and recommendations • To collectively discuss development-related policy gaps and actions to consider in the plan **Discussion Questions included:** • Do you have any comments or suggestions on the overall transportation network solution that would improve transportation access? • For transportation policies • Are there other policy aspects that are important for the City to consider promoting sustainable mobility in new developments? • What are the trends with respect to parking demand for new residential and commercial development?

3.5 Public and stakeholder response by the numbers

The following public and stakeholder response by the numbers in **Table 3-8** represents the number of community members who connected with and participated in the VTP public and stakeholder engagement process.

Table 3-8: Public and Stakeholder Response by the Numbers

Number involved	Public and Stakeholder Engagement Activity Undertaken
9,829	Visitors to the VTP project website (as of December 2022)
423	Respondents to the 2020 Community Survey
225	Participants at the Pop-up workshops held at the City of Vaughan Winterfest and the 2020 Vaughan Business Expo
280	Individuals directed to the Project Website and the Open House Materials during Public Open House #1
534	Visits to the website for Public Open House #1
17	Individual respondents to Public Open House #1 Feedback Questions
19	Attendees/connections at the Public Open House #1 Live Presentation
5	Neighbourhood Associations who returned Kitchen Table Guides
146	Individuals directed to the Project Website and the Open House Materials during Public Open House #2
129	Visits to the website for Public Open House #2
33	Individual respondent to Public Open House #2 Feedback Questions
19	Attendees at the Public Open House #2 Live Presentation
63	Participants at Stakeholder Workshops (7 workshops)
10	Participants at Older Adult Task Force Meeting
22	Emails received and responded to from the public, not including emails related to the Kitchen Table Guide, TAC members, or consultant requests.

3.6 How Public and Stakeholder Input was reflected in the VTP

The project team received public and stakeholder input related to a wide range of interests in the VTP project. There was a high level of interest in the VTP, and the engagement significantly shaped how the VTP was developed through detailed conversations on the future of transportation and mobility. Some community members provided input at specific phases and others were engaged throughout the engagement process. Participation by the public and stakeholders was thoughtful, constructive, and forward-thinking. Many ideas and opinions were expressed about what is needed in Vaughan to transform transportation choices. The final VTP was informed by input from the public and stakeholders on key aspects of the plan including alternative transportation solutions, policy directions and implementation framework.

Chapter 3 provides an overview of the common themes and key messages heard through each Phase and highlights how this input was reflected in the development of the VTP. Public and Stakeholder input was documented throughout the process. The detailed feedback reports and meeting summaries are posted on the City website and should be read in conjunction with this report for a full picture of what was heard.

Phase 1 Public and Stakeholder Engagement Activities, including the pop-up workshops and community survey, provided views on gaps, concerns and ideas for transforming the City's transportation network. Ideas about how to improve walking, cycling and transit were considered in the review of the existing transportation network, input to the Problem and Opportunity Statement and development of alternatives.

Phase 2 Public and Stakeholder Engagement Activities, including the stakeholder workshop meetings and Public Open House #1, provided input on challenges and opportunities and

specific feedback on the Problem and Opportunity Statement, draft alternatives and evaluation criteria. Input received in Phase 2 was considered in the evaluation of alternatives.

Community members were provided with the proposed criteria for evaluating the alternatives and were asked whether these criteria reflect what is important to them by ranking the evaluation criteria. Most of the responses indicated that the criteria used to evaluate alternatives reflected what is important to them.

Community members were also asked about preferences with respect to the alternatives. There was significant support for Alternative 3 (Multi-modal) which was carried forward. Key reasons noted for why the multi-modal alternative was preferred include the following:

- Support focus on minimizing auto improvements and maximizing non-motorized trips and transit
- Support addressing gaps at intersections, between blocks, and across the City to create an efficient and safe active transportation network.
- Would like to see the prioritization of the multi-modal and public transit ideas of this plan.
- Incorporated Alternative 2 (Green Alternatives) noting it has similar benefits.

Common themes and key messages heard from the public and stakeholders in phase 2 are shown in **Table 3-9** and **Table 3-10**, respectively. This input was instrumental in developing the draft recommended transportation network solution (Alternative 3: Multi-Modal), implementation plan and draft policy recommendations which were presented in Phase 3.

Table 3-9: Common themes and key messages heard from the public in phase 2

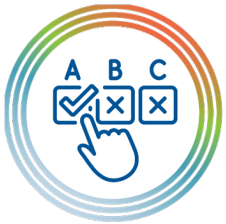
Plan Goal	What we heard from the Public in Phase 2 Consultation
Build Infrastructure 	• Create a safer walking environment. • Create protected bike routes for cyclists of all ages and abilities. • Address gaps in the street network.
Empower Choice 	• Focus on building complete communities to reduce travel. • Support improved frequent and reliable transit service. • Encourage employers to add bike racks and change and shower facilities.
Think Forward 	• Support for green initiatives to address climate change. • Encourage new development to include electric vehicle charging stations. • Consider new services such as electric on-demand transportation to improve equity.

Table 3-10: Common themes and key messages heard from stakeholders in phase 2

Plan Goal	What we heard from Stakeholders in Phase 2 Consultation
Build Infrastructure 	• Better connections to transit are a key transportation priority. This includes connections from Brampton and Toronto. • Poor east-west transit connections across Vaughan are hindering employee attraction and business expansion. • Poor first and last-mile walking and cycling infrastructure is a bigger issue than most may think for attracting and retaining employees. • Congestion along Highway 7 is challenging for the movement of large carriers and is impacting business operations. • More work is needed to improve active transportation in the areas around Langstaff, Highway 50, Highway 27, Major Mackenzie and Huntington Drive.
Empower Choice 	• Better transit service and connections to existing workplaces are needed in many areas of Vaughan. • Walking infrastructure from major bus routes is lacking and creates further challenges for those employees who can find transit close to workplaces. • Make cycling safer on major routes. • Improve neighbourhood-level cycling connections. • A desire for bike share options. • More flexibility in site design and focus on complete streets. • Road design and parking need to be looked at differently with structural changes to ROW widths and parking regulations if a move away from auto-dependency is to be achieved.
Think Forward 	• Shuttles to improve first-mile and last-mile connections. • Micro-mobility options within the VMC. • Potential for experimenting with electric fleets with the caveat that while there is potential for a shift to newer technologies caution is needed when investing in huge infrastructure projects for technologies that could shift quickly.

The Phase 3 Public and Stakeholder Engagement Activities including the stakeholder workshop meetings and Public Open House #2 provided input on the recommended transportation network solution – Alternative 3: Multi-Modal, implementation plan and draft policy recommendations. Refinements to the Multi-modal alternative reflected the feedback on the prioritization of transit connections and new infrastructure to support mobility choices. The ideas

and opinions expressed about the prioritization of projects were considered in the development of the implementation plan. The policy recommendations including support for 15-minute neighbourhoods, developing a goods movement strategy, and considering future mobility options reflect public and stakeholder opinions articulated through the engagement.

In Phase 3, community members could view interactive maps of the transportation network recommendations including the following: Multi-Modal Alternative Improvements, Grade Separated Rail Crossing, Road Improvements, Transit Service Improvements, Interchange Improvements, GO Rail, Planned Highway Extensions by Others, Existing Road Network, Active Transportation Priority Areas. Comments received were addressed through refinements to the transportation network recommendations.

Information was presented that described how Alternative 3: Multi-Modal meets the goals of the Plan. Community members were asked if they agreed with the description with the majority indicating – yes.

Through the discussion of the draft policy recommendations, additional comments were noted. Additional comments from the public and stakeholders in Phase 3 are shown in **Table 3-11**. These and other detailed comments were considered and incorporated into policy recommendations where applicable. Comments that relate to other City initiatives will be considered in other related work.

Table 3-11: Additional comments from the public and stakeholders in phase 3

Plan Goal	What we heard from the Public and Stakeholders in Phase 3 Consultation
Build Infrastructure	• Create cycling connections within neighbourhoods to get to the trails. • Design safer separated bike lanes, addressing right turns on red and implications for cyclists and consideration for implementing delayed crosswalks • Concerns about how bike share and bike parking are calculated and addressed noting that the number of spaces seems excessive. • Parking is still in demand by employees and is being constrained in some areas (e.g., Vaughan Metropolitan Centre)
Empower Choice	• Shared micro-mobility hubs near key destinations. • Secure weather-protected bike parking and storage facilities at destinations. • Creating resources e.g., route maps, and apps for promoting cycling. • More electrical vehicle charging stations.
Think Forward	• The potential for E-bikes to be a game changer in terms of increasing cycling. • Address the changing transportation needs of the aging population including accessibility for wheelchairs and electric vehicles and services i.e., OnDemand transportation. • Optimize deliveries using new technology (e.g., Electric vehicles and Drones and consolidated delivery locations).

The goal of the public and stakeholder engagement process for the VTP was to facilitate robust conversations on future directions for developing a longer-term plan for how residents and workers will move about the City. In reflecting on the effectiveness of public and stakeholder engagement, the following were important considerations for meeting this goal:

- Providing well-designed engaging public meeting materials that told a story of what was being considered at each phase and why it matters to community members.
- Using techniques that support different ways of learning and participating including pop-up workshops, community surveys, meetings and different formats for public open houses,

- Mobilizing input through the hosting of smaller group stakeholder workshops where topics could be discussed in more detail.
- Providing online formats and live presentations for Public Open Houses to enable community members to choose which format was most appealing to them.
- Being transparent by documenting what was heard and sharing key themes and messages on the website and in meetings and activities.
- Listening and learning from different viewpoints and incorporating ideas into key aspects of the VTP.
- Continually adapting approaches and techniques to get the most out of the engagement. This included a pivot to virtual engagement due to the Covid-19 pandemic.

There is much interest in how the plan will be implemented. The stakeholders who participated in the engagement process, including the Major Businesses and Employers, Goods Movement and Logistics Companies, Builders and Development Representatives and Cycling Advocates have expressed interest in continuing to be involved and supporting the City as it moves forward to implementation.

4 Problem and Opportunity Statement

The public and stakeholder engagement program and existing and future needs assessments informed the development of a problem and opportunity statement. This statement defines the key challenges facing the City's transportation system and informs the development of alternative solutions.

This Chapter describes the problem and opportunity statement, lays out the vision of the VTP, and provides the path to achieving the transportation vision, with accompanying objectives and goals.

4.1 Problem and Opportunity Statement

Vaughan is one of the fastest-growing municipalities in Canada. The VTP is a long-term blueprint to move people and goods safely, efficiently, and sustainably, supporting current and future residents, businesses, and visitors.

The City has largely been built for the private vehicle resulting in large distances between land uses, reliance on private vehicle travel, and traffic congestion.

As the City grows with support from provincial and regional transit investments, there are opportunities to address the needs of all modes of travel by improving the connectivity and safety of active transportation infrastructure and the accessibility and frequency of transit service.

By building the right infrastructure, empowering mobility choice, and thinking forward, the City has an opportunity to provide high-quality, attractive, competitive, and sustainable mobility choices.

4.2 Vision

The vision for the Vaughan Transportation Plan is to provide high-quality, attractive, competitive, and sustainable mobility choices to every resident, business and visitor in Vaughan. There are four main pillars of this vision:

1. **Provide choices** by letting people decide how they will travel by providing multiple attractive options – instead of being limited by having to drive to their destination,
2. **Move more people and goods** by improving sustainability, and maximizing infrastructure to be used effectively and flexibly for people and goods,
3. **Be equitable** by creating a transportation system that serves everyone, regardless of age, ability, background, and income level, and
4. **Promote good health** by minimizing pollution and greenhouse gases from vehicles and building safe infrastructure for vulnerable users.

4.3 How Will We Get There?

There are three main steps to achieving this vision, which are the plan directions:

1. Build infrastructure,

2. Empower choice, and
3. Think forward.

This will involve improvements to walking, cycling, transit and driving in the City, acknowledging that the status quo will be insufficient to meet Vaughan's future needs. The following subsections explore these goals in further detail.

4.3.1 Build Infrastructure

Investing in accessible, safe, and efficient infrastructure is key to offering residents and visitors mobility choices. Ensuring that all users, whether they be walking, cycling, riding a bus, or driving, can move around safely and efficiently is a cost-effective and environmentally friendly strategy to manage congestion and accommodate growth in the transportation system. Public feedback indicated that the following was important to the public and stakeholder groups:

- Creating a safer walking environment.
- Creating protected bike routes for cyclists of all ages and abilities.
- Addressing gaps in the street network.

4.3.2 Empower Choice

People are creatures of habit. In Vaughan, because of the convenience of driving, people are most accustomed to travelling by car. The VTP aims to promote more travel options, such as transit, walking and cycling, as viable, safe, and attractive choices. Each person that can use an alternate form of travel is one less car on a congested road, reducing the need for costly new roads and road expansions while also reducing greenhouse gas emissions. Empowering residents and visitors of Vaughan to choose more sustainable travel modes can be achieved through the City's Transportation Demand Management process. Public feedback indicated that the following was important to the public and stakeholder groups:

- Focusing on building complete communities to reduce travel.
- Supporting improved, frequent, and reliable transit service.
- Encouraging employers to add bike racks and change and shower facilities.

4.3.3 Think Forward

We need to harness new methods and technologies to meet the transportation needs of Vaughan today and in the future. City intensification and population growth mean that people need different options to get from Point A to Point B safely and conveniently. New ways to move around may provide more pleasant experiences for travellers while being more environmentally sustainable. Public feedback indicated that the following was important to the public and stakeholder groups:

- Supporting green initiatives to address climate change.
- Encouraging new development to include electric vehicle charging stations, and;
- Considering new services such as electric on-demand transportation to improve equity.

4.4 Objectives

The VTP's objectives are how we will measure which alternatives best meet the broader vision and goals. Thus, they serve as the evaluation criteria for transportation network alternatives. These are presented below in **Figure 4-1**.

Figure 4-1: VTP Objectives

The objectives are the same as those identified in the 2012 TMP with exception of the updated Equity objective which more broadly reflects Transportation Systems / Transportation Demand Management (TSM/TDM). These represent aspirational characteristics of the future network and provide a holistic evaluation of different transportation aspects. Structuring the objectives in this manner will maximize the benefits of the future transportation system.

5 Build Infrastructure

This chapter discusses the process to select the preferred alternative, including the framework used (**Chapter 5.1**), the alternatives developed and evaluated (**Chapter 5.2**), the evaluation results (**Chapter 5.3**), and a description of the Preferred Transportation Infrastructure Alternative (**Chapter 5.4**).

5.1 Evaluation Framework

To evaluate alternative solutions and their associated infrastructure improvements, a set of criteria were developed from the plan objectives. These are shown in **Figure 4-1**, and also present the question that the evaluation criteria would attempt to answer through more specific individual metrics.

The criteria above were quantified into specific metrics that could be calculated through modelling, as described in **Chapter 2.5** or other analyses for each alternative solution. Note that some of these metrics are qualitative instead. The metrics formed the alternative evaluation framework, used to evaluate each alternative solution and compare results against one another. The alternative evaluation framework is presented in **Table 5-1**.

Table 5-1: Alternative Evaluation Framework

VTP Objective	Metric	Metric Description
Accessibility & Connectivity	System Reach	# of jobs accessible to Vaughan residents within 45 minutes by auto
		# of jobs accessible to Vaughan residents within 45 minutes by transit
		# of population within 45 minutes of jobs in Vaughan by auto
		# of population within 45 minutes of jobs in Vaughan by transit
Environmental Stewardship	VKT or equivalent GHG emissions	VKT (vehicle-kilometres travelled) for residents and employees of Vaughan.
		Estimated GHG emissions based on VKT for residents and employees of Vaughan.
Equitable	Modal travel time ratio comparison	Average transit/auto travel time ratio for Vaughan zones
		Average transit/auto travel time ratio for Vaughan social-equity seeking zones
Financial Sustainability	Relative cost estimate of alternative	Comparison of cost estimates, relatively, for each alternative (e.g., high, medium, low)
Reliability / Resilience	Delays due to congestion	VHT (vehicle-hours travelled) for all road links
		VHT for congested road links with V/C > 1.00
		Transit rider - hours travelled for all road links
		Transit rider - hours travelled for congested road links
		Lane-km of road links with V/C > 1.00
Safety	Inherent to future designs	New infrastructure will be designed to be safe by design, based on best practices of the day.

The following are some details on metrics in the alternative evaluation framework.

- To estimate greenhouse gas (GHG) emissions, factors were used from the US Federal Highway Association (FHWA) guidance to relate vehicle-kilometres travelled to kilogram CO_2 equivalent based on average speed and vehicle type.
- Two qualitative metrics were used: financial sustainability was evaluated based on cost relative to the Do-Nothing alternative solution, and safety looks at the safety of all modes of travel, where new infrastructure would be designed to be safe based on best practices.
- The remainder of the metrics were evaluated on a network-level basis using the Vaughan Travel Demand Model (which is described in **Chapter 2.5**).

5.2 Alternatives

As part of the development of the Vaughan Travel Demand Model (VTDM, described in **Chapter 2.5.1**), a Do-Nothing alternative was developed with a subset of projects that were actively in delivery or fully funded and committed to. This alternative served as the base to understand how forecasted land use would impact the transportation network with few improvements, and served as the base of comparison against which other future alternatives were evaluated.

Four alternative scenarios were developed from the Do-Nothing alternative. These are presented in **Figure 5-1**.

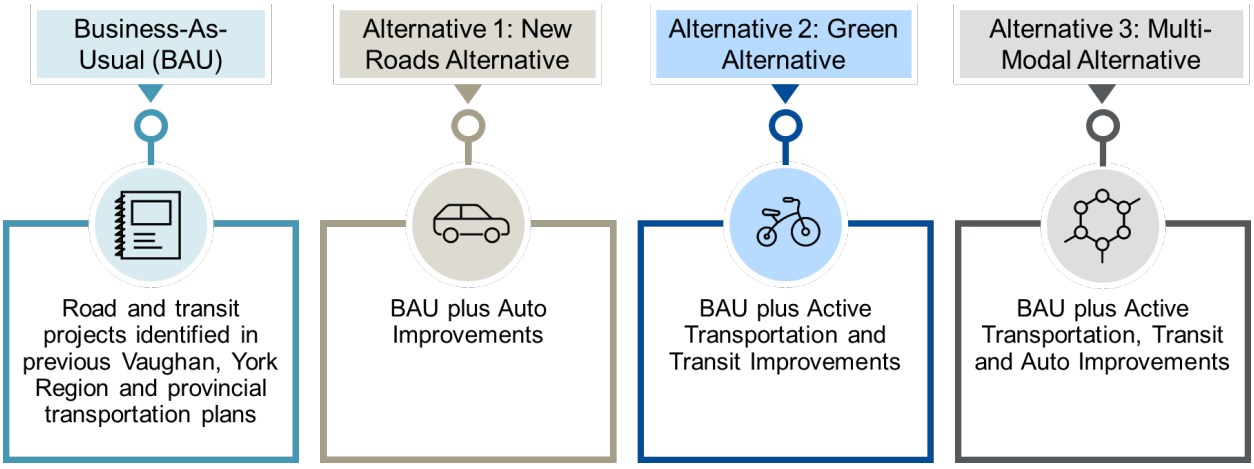


Figure 5-1: Future Alternatives Development

The following subsections describe these alternative scenarios in further detail. The component improvements that form these alternatives for each mode are provided in **Appendix F: Proposed Improvements in Transportation Alternatives.**

5.2.1 Business-As-Usual

The **Business-As-Usual (BAU)** Alternative includes road projects that were identified (but not necessarily committed to or funded) in previous Vaughan, York Region, and other Provincial transportation plans. This alternative also includes transit projects from the 2041 Metrolinx Regional Transportation Plan (RTP) that were identified as high priority and relevant to the City. This alternative is shown in **Figure 5-2**, on the following page.

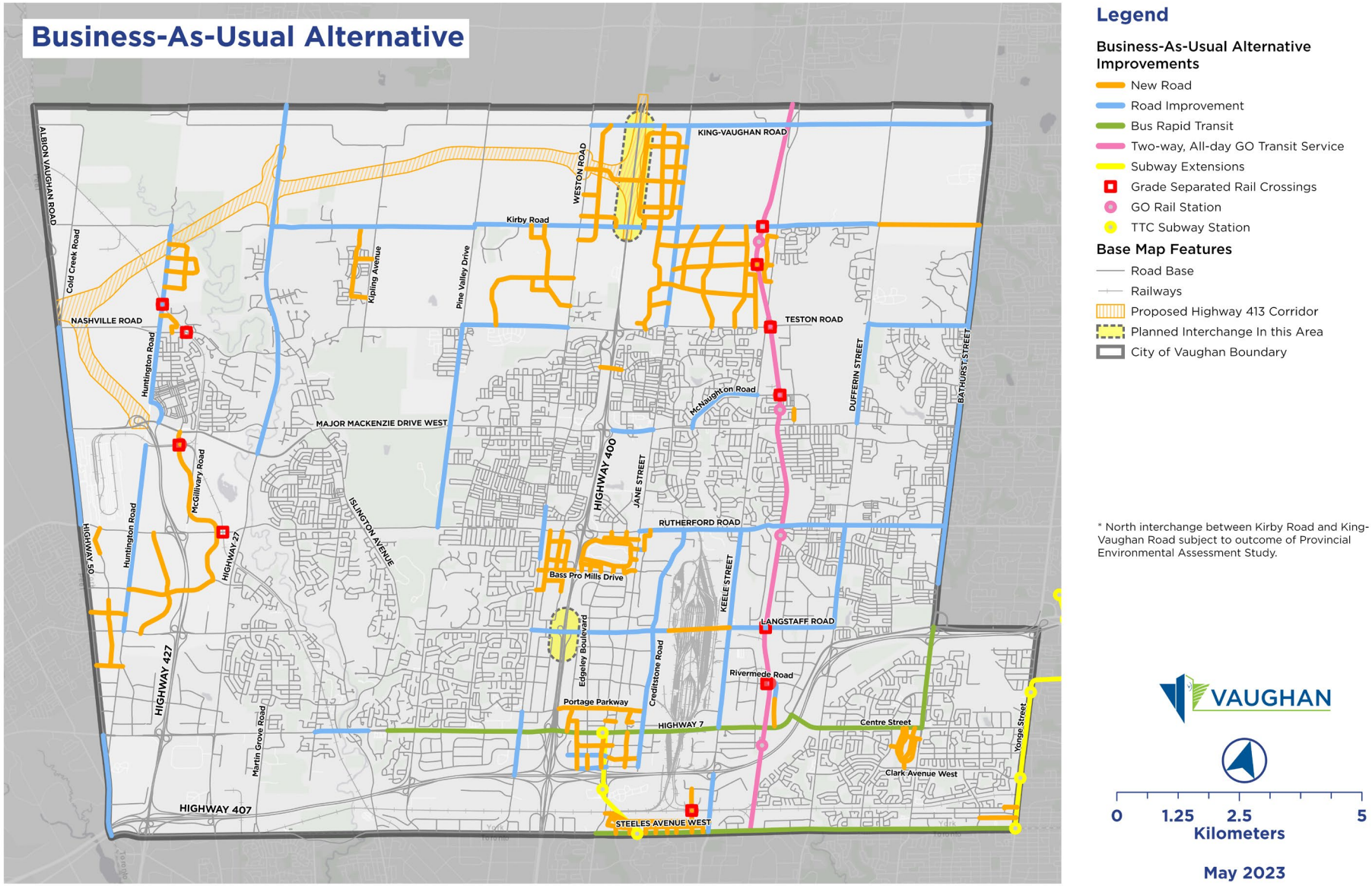


Figure 5-2: Business-as-Usual Alternative

5.2.2 Alternative 1: New Roads Alternative

The **New Roads Alternative** includes all road and transit projects in the BAU, with added road improvements identified through the Needs Assessment described in **Chapter 2.5**. This alternative evaluates the impacts of only using road improvements to address needs in the transportation network and is presented in **Figure 5-3** below.

The network mapped below also includes two extensions that are illustrated with dotted lines – these consist of road extensions that were justified on a technical basis by analysis but will not be implemented or have not been approved by Council in the past. BAU improvements are shown with thinner lines to differentiate from alternative-specific improvements in the subsequent mapping of each alternative.

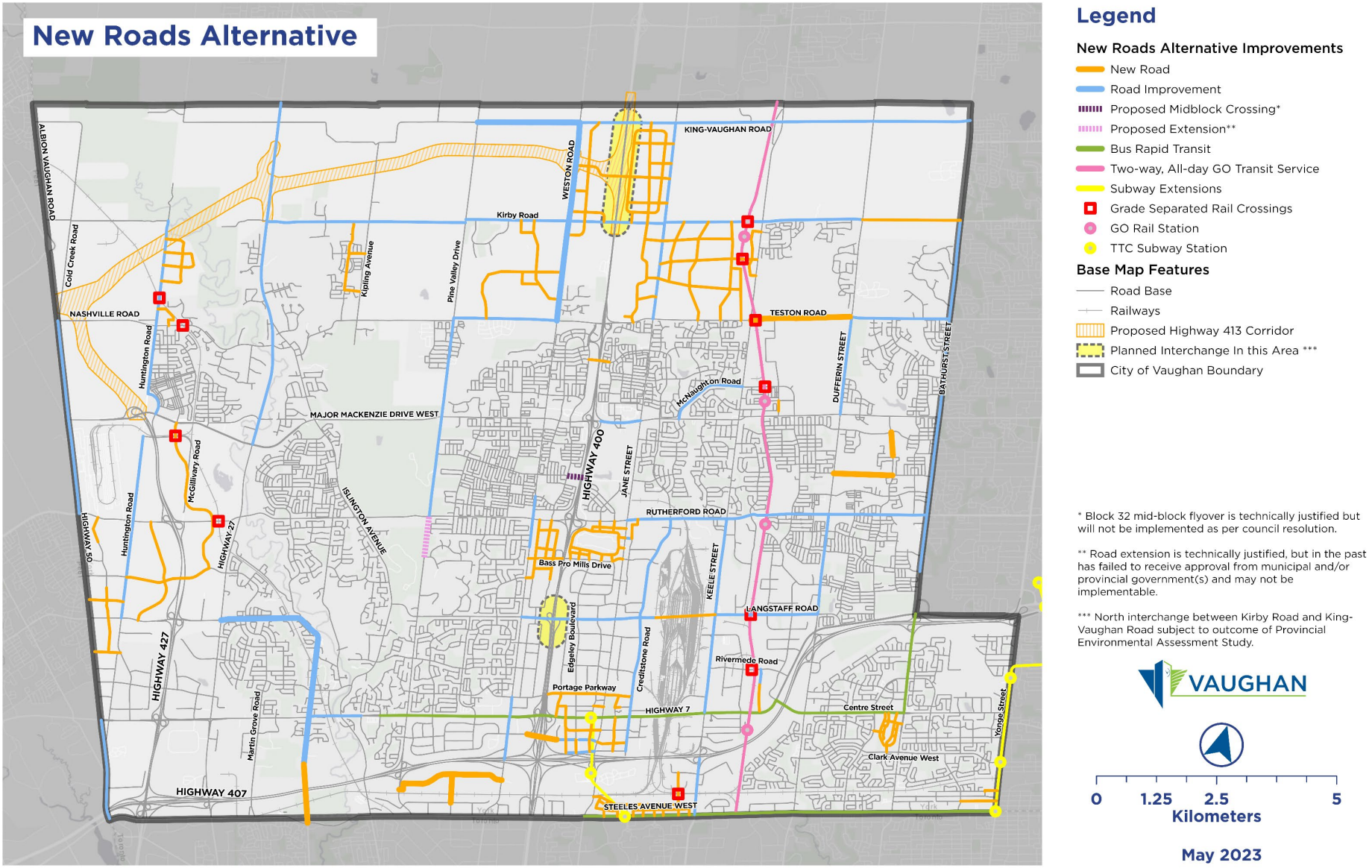


Figure 5-3: New Roads Alternative Map

5.2.3 Alternative 2: Green Alternative

The **Green Alternative** includes all road and transit projects in the BAU, with added surface transit and active transportation network improvements.

This alternative is presented below in **Figure 5-4**.

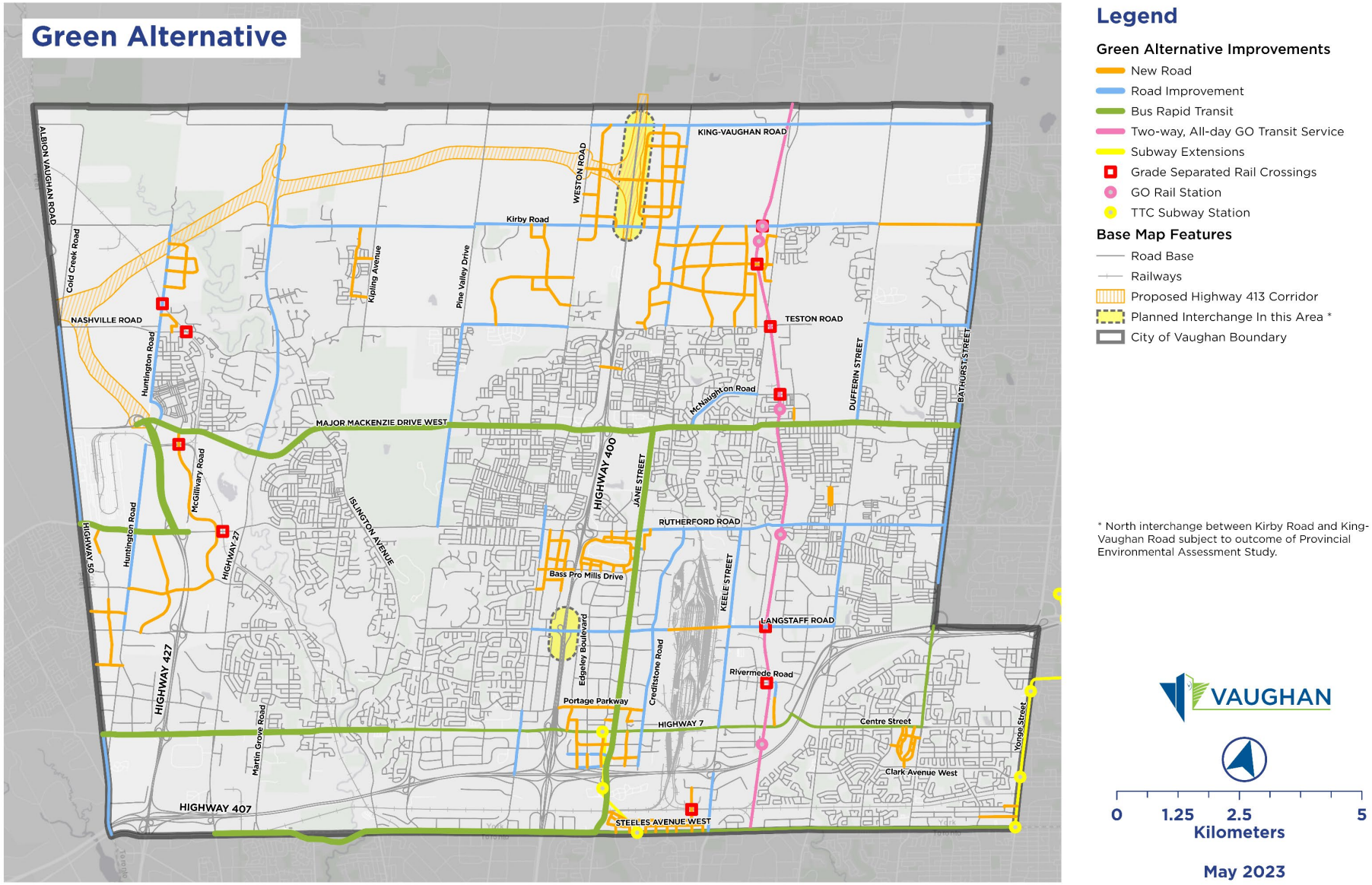


Figure 5-4: Green Alternative

5.2.4 Alternative 3: Multi-Modal Alternative

The **Multi-Modal Alternative** includes all road and transit projects found in the Green Alternative, with above-ground transit, and active transportation network improvements, as well as a subset of road improvements. This alternative is presented in **Figure 5-5**.

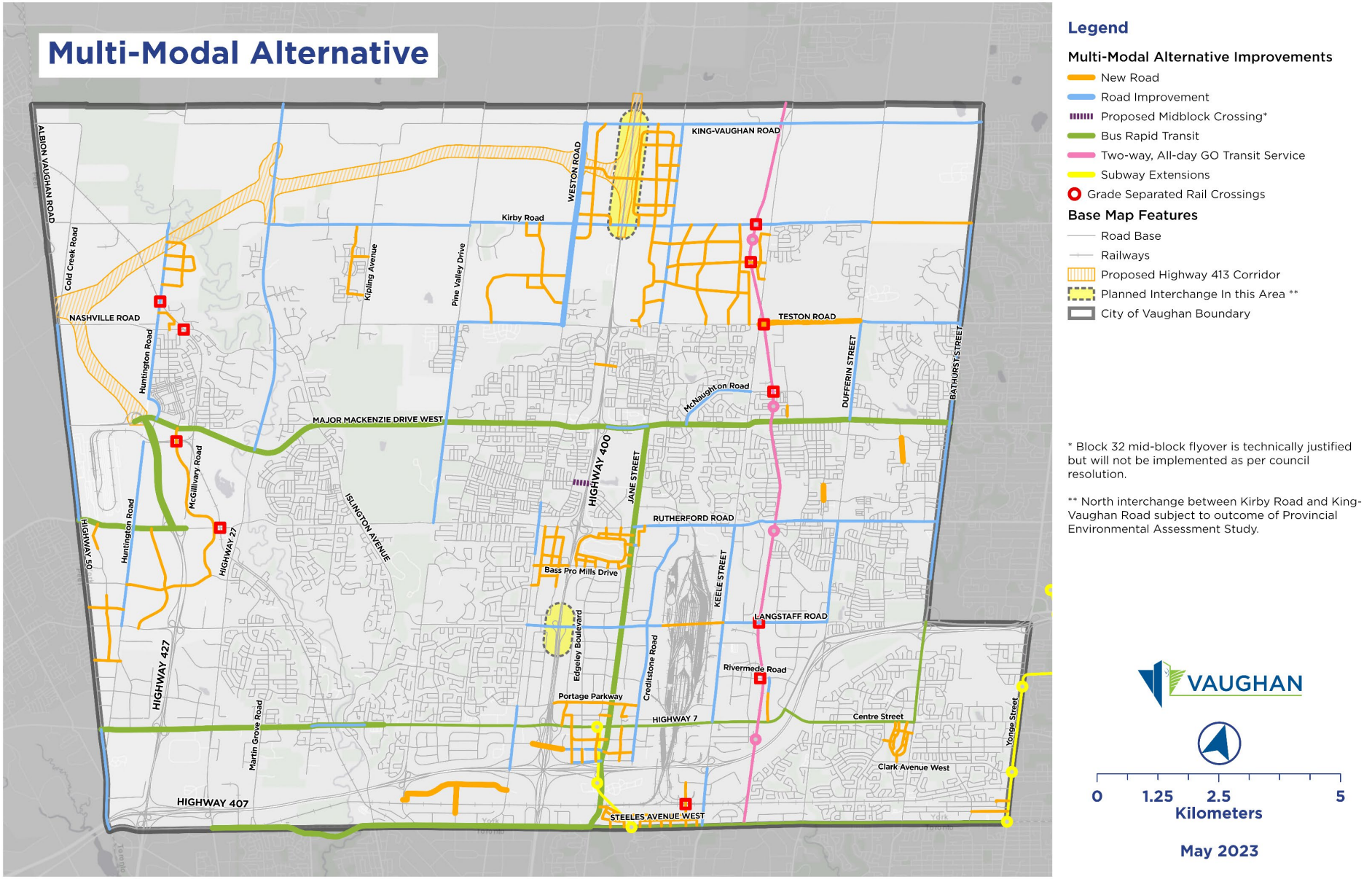


Figure 5-5: Multi-Modal Alternative

5.3 Evaluation

Evaluating the alternatives presented above involved using the VTP objectives presented in **Figure 4-1**. These were expanded on further to create an alternative evaluation framework to supply specific measures that could either be assessed qualitatively for each alternative relative to the Do-Nothing Alternative or that could be evaluated quantitatively through travel demand modelling using the VTDM. The alternative evaluation framework is presented below in **Figure 5-1**.

Table 5-2: Alternative Evaluation Framework

VTP Objective	Metric	Metric Description
Accessibility & Connectivity	System Reach	Jobs accessible to Vaughan residents within 45 minutes by auto
		Jobs accessible to Vaughan residents within 45 minutes by transit
		Population within 45 minutes of jobs in Vaughan by auto
		Population within 45 minutes of jobs in Vaughan by transit
Environmental Stewardship	VKT or equivalent GHG emissions	VKT (vehicle-kilometres travelled) for residents and employees of Vaughan.
		Estimated GHG emissions based on VKT for residents and employees of Vaughan.
Equitable	Modal travel time ratio comparison	Average transit/auto travel time ratio for Vaughan zones
		Average transit/auto travel time ratio for Vaughan social-equity-seeking zones
Financial Sustainability	Relative cost estimate of alternative	Comparison of cost estimates, relatively, for each alternative (e.g., high, medium, low)
Reliability / Resilience	Delays due to congestion	VHT (vehicle hours travelled) for all road links
		VHT for congested road links with V/C > 1.00
		Transit rider - hours travelled for all road links
		Transit rider - hours travelled for congested road links
		Lane-km of road links with V/C > 1.00
Safety	Inherent to future designs	The new infrastructure will be designed to be safe by design, based on the best practices of the day.

The evaluation results using the framework presented above are shown on the following page, in **Table 5-3**. Note that metrics such as vehicle-kilometres travelled, vehicle hours travelled, and lane-kilometres are calculated for links in Vaughan only. Results are coloured qualitatively to show the relative impact of the evaluation metrics of each alternative. These are calculated relative to the Do-Nothing alternative, which serves as the basis for the comparison of each alternative.

Table 5-3: Alternative Evaluation Results

				Compared to Do Nothing			
VTP Objective	**Metric**	**Description**	**Units**	**BAU Alternative**	**New Roads Alternative**	**Green Alternative**	**Multi-Modal Alternative**
Accessibility & Connectivity	System Reach	Jobs accessible to Vaughan residents within 45 minutes by auto	Jobs	-	9,000	1,000	7,000
		Jobs accessible to Vaughan residents within 45 minutes by transit	Jobs	36,000	56,000	60,000	87,000
		Population within 45 minutes of jobs in Vaughan by auto	Population	3,000	48,000	10,000	52,000
		Population within 45 minutes of jobs in Vaughan by transit	Population	-	27,000	35,000	70,000
Environmental Stewardship	VKT or equivalent GHG emissions	VKT for residents and employees of Vaughan.	veh*km	(2,000)	16,000	(25,000)	(20,000)
		Estimated GHG emissions based on VKT for residents and employees of Vaughan.	kg CO2 equiv	-	3,000	(3,000)	(2,000)
Equitable	Modal travel time ratio comparison	Average transit/auto travel time ratio for Vaughan zones	dimensionless (ratio)	(0.00)	(0.00)	(0.10)	(0.02)
		Average transit/auto travel time ratio for Vaughan social/equity zones	dimensionless (ratio)	(0.01)	(0.00)	(0.03)	0.07
Financial Sustainability	Relative cost estimate of scenario	Comparison of cost estimates, relatively, for each scenario (e.g. high, medium, low)	Qualitative				
Reliability / Resilience	Delays due to congestion	VHT (for all road links)	veh*hr	(100)	(600)	(1,800)	(2,000)
		VHT (for congested road links with V/C > 1.00)	veh*hr	-	(1,700)	(2,100)	(2,800)
		Transit rider - hours travelled (for all road links)	person*hr	500	500	2,300	2,900
		Transit rider - hours travelled (for congested road links)	person*hr	500	300	1,100	1,500
		Lane-km of road links with V/C > 1.00	lane*km	-	(26)	(32)	(44)
Safety	Inherent to future designs	The new infrastructure will be designed to be safe by design, based on the best practices of the day.	Qualitative				

Better
Similar
Worse

*Note: values in brackets are negative

5.4 Preferred Transportation Infrastructure Alternative

Selecting a draft preferred alternative involved careful consideration of the performance of the alternatives above, not just in comparison against the Do-Nothing alternative, but also on a relative basis against one another. Trade-offs between evaluation metrics must be considered. Additionally, public and stakeholder consultation helped bridge the gap between what improvements the needs assessment suggests and what the public is looking for, which is discussed in **Chapter 3.6**.

Based on the evaluation in **Table 5-3**, the **Multi-Modal Alternative** was selected as the preferred transportation infrastructure alternative. Additionally, consultation with community members also showed significant support for the Multi-Modal Alternative, supporting reducing the focus on minimizing (but not eliminating) auto improvements and maximizing non-motorized trips and transit.

This alternative provides a balanced combination of walking, cycling, transit, and auto network improvements, and showed the following benefits in analysis:

- Increased accessibility for all modes from Vaughan to people and jobs.
- Decreases vehicle hours travelled.
- Increased transit rider hours in Vaughan.

It was noted that one of the metrics, the average transit/auto travel time ratio for social/equity-seeking zones, increased from Do-Nothing to Multi-Modal. The metric does not capture mode switching, and users switching from auto to transit would make this measure increase (as transit trips are inherently longer). This implies that transit became more attractive for users in equity-seeking zones, which in turn improves the number of travel options available to them. However, it also highlights the disparity between auto and transit trip travel times, which should be considered for improvements.

Additionally, sensitivity tests were undertaken for three scenarios: the removal of Highway 413 from the preferred network, the addition of Caledon-Vaughan GO commuter rail service with several stops in Vaughan to the preferred network, and the removal of the Brampton Queen Street BRT from the preferred network. These tests were coded into the VTDM network and evaluated using the same framework as the alternatives. The intention of these sensitivity tests is to inform future planning and prioritization of the preferred network and understand the individual effect of these regional and provincial improvements on Vaughan travellers. They do not change the status of the Multi-Modal Alternative as the preferred transportation infrastructure alternative. The results of the sensitivity analyses are provided in **Appendix B: Transportation Needs Assessment and Alternative Development**.

It can be noted that several additions to the network were made for the final 2051 Recommended Transportation Network. Some of these projects were not analyzed as part of the Multi-Modal network initially. Among these is the abovementioned proposed Caledon-Vaughan GO service, which was included in the preferred network to maintain consistency with the 2022 York Region TMP rapid transit network. Additionally, several grade separations and

road improvements were also included for consistency between the VTP and 2022 York Region TMP. York Region road improvements are highlighted with a green hatch.

The preferred alternative is presented in the following figures, **Figure 5-6** for the 2051 Recommended Transportation Network and **Figure 5-7** for the 2051 Active Transportation Network. A list of projects is provided in **Appendix G: Implementation, Cost Estimates and Proposed EA Schedules** for each project in the preferred network.

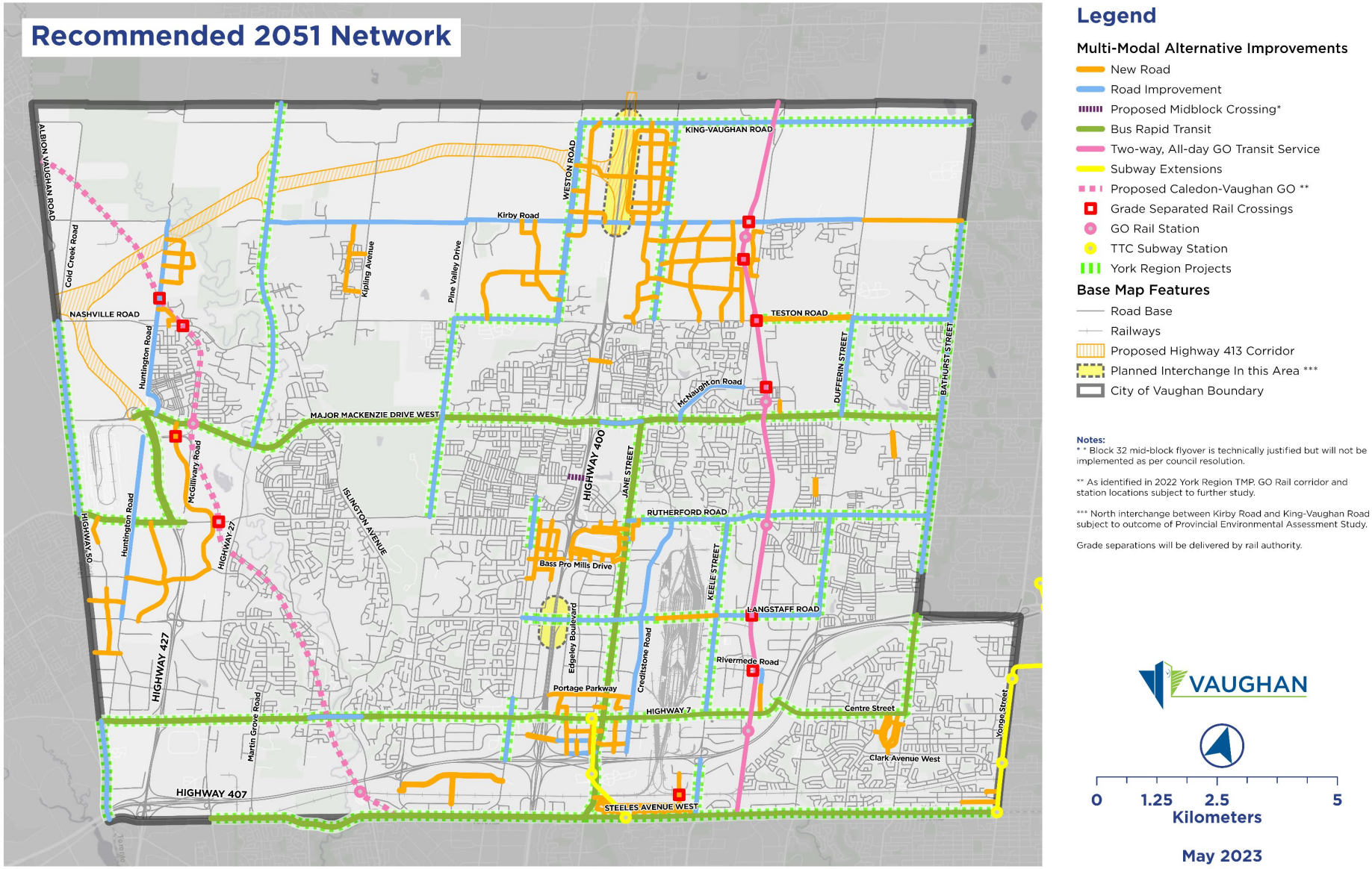


Figure 5-6: 2051 Recommended Transportation Network

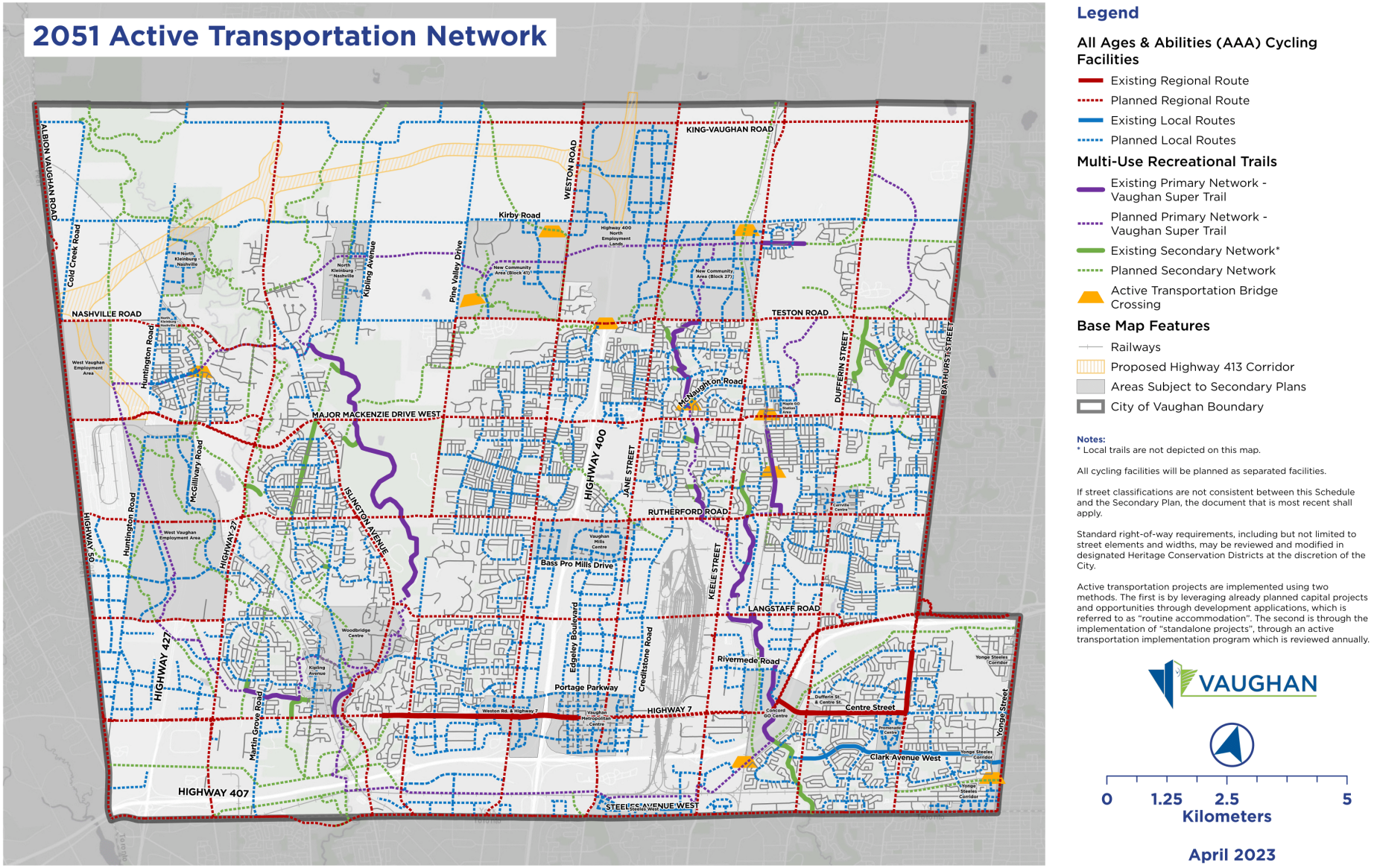


Figure 5-7: 2051 Preferred Active Transportation Network

5.5 Build Infrastructure: Actions and Initiatives

5.5.1 Resilient Infrastructure Design

Cities, communities, businesses, and individuals are facing new and intensifying challenges from extreme weather events, increasing air temperatures, and increases in precipitation intensities and flooding because of climate change. The City has taken a proactive approach to look at transportation systems differently with a climate lens to determine actions to address climate change head-on through the VTP. A sustainable transportation system can be described as one that is aligned with land use, and supports healthy and complete communities, is equitable, and provides safe, convenient, and reliable connections, and supports a high quality of life, a prosperous and competitive economy, and a protected environment. Greater transportation resilience can be achieved by implementing planning and land use policies that focus on building resilient design into existing and new infrastructure, promoting compact urban forms, and encouraging the use of a variety of transportation modes.

A review of best practices and existing policies was performed to understand the policies and plans that currently exists and actions that are underway. Climate change projections were also reviewed at several scenarios of differing intensity levels, with the following findings:

- **Air temperature.** Canada is warming at a rate that is twice the global rate. As such, the air temperature within the City is projected to increase both for minimum and maximum annual averages. The number of very hot days (≥30˚C) is also projected to increase.
- **Precipitation.** Precipitation is strongly related with air temperature, where warmer air results in the atmosphere having higher ability to hold and release moisture. Resultingly, precipitation is projected to increase within the City as well. Additionally, intensity is projected to increase, with the number of heavy precipitation events and accordingly, flood risk forecasted to increase.
- **Extreme events**. The likelihood of extreme events, such as ice jam flooding, extreme flooding, tornadoes, severe thunderstorms, and lightning increases. The increase in risk can be difficult to quantify, however, as these are typically ancillary impacts of changes to air temperature and precipitation, which are primary outputs of climate models.

Changes to climate, including but not limited to changes in air temperature and frequency of extreme storms are applicable to all the City's infrastructure, with impacts from these events likely a function of infrastructure condition. The City's infrastructure must be durable, adaptive, and resilient to the current climate and future climate, including extreme weather events.

This analysis also undertook GIS mapping to identify areas where increased floodplain area would overlap with existing and recommended infrastructure.

Recommendations:

Appendix H: Climate Change and Resiliency Whitepaper, provides a quantification of future changes in climate parameters and hazards, and a qualitative examination of potential impacts and decision support for resilient actions. These findings are intended to lead to the next step a resiliency framework, which concerns the strategic planning, funding, and prioritization of these

resilient actions. The recommendations will become part of a broader discussion of resilient actions that will align stakeholders with the other components of this project later.

The following next steps and recommendations were provided as part of this analysis:

- Evaluate opportunities to build in climate-resilient actions into the project planning process.
- Examine opportunities to increase resilience to anticipated climate hazards through infrastructure design standards and guidelines.
- Continue to monitor infrastructure at risk due to climate change**.**

5.5.2 Transportation monitoring and modelling program

Advances in transportation data collection, including application and GPS-based collection of travel behaviour data, and in transportation modelling, such as activity-based modelling will change how infrastructure and policies are developed and evaluated in the future. These advancements should be leveraged to maximize the benefit of investments in transportation infrastructure. Together with the Vaughan Travel Demand Model (VTDM) developed as part of the VTP, this monitoring initiative will ensure that design-making is well informed by the latest forecasts, and the latest trends.

In addition, there is an immediate need to understand the significant changes in travel behaviour which have occurred due to the COVID-19 pandemic, in the case that some of these behaviour changes persist beyond the pandemic to a new normal.

As part of the VTP, a review of potential data sources and practices related to collection was undertaken, with three main steps:

1. Review of the City's current data sources, their application, emerging data sources, best practices in collection and applying emerging data sources in North America and a summary of constrains and opportunities.
2. Questionnaire to peer municipalities to understand best practices, including for data management and storage, organization, staffing and budgeting.
3. Data collection implementation plan, summarizing both data collection and management "needs" and "wants" for the City.

Recommendations

The following transportation needs were identified and are recommended to be implemented in the short term by the appropriate City departments:

Transportation Data Management System. The implementation plan recommended a standardized platform to manage transportation data that is collected on an ongoing basis, with Traffic Engineering Software (TES) used as the data management platform of choice among peer municipalities.

Impact: Monitoring a transportation network requires data on an ongoing basis and establishing the system to manage transportation data allows the City to have a centralized platform in which to store transportation data and establish historical bases for comparison.

Annual Traffic Count Program. The implementation plan recommended collecting turning movement counts a minimum of once every three years, and a total of approximately 535 intersections were recommended to be included in the program. Collecting annual average daily traffic (AADT) was also recommended for vehicles on segments bounded by arterials on the same tri-annual basis, and for cycling on all separated cycling facilities annually.

Impact: Collecting traffic count and AADT data allows the City to monitor the change in traffic movements and volumes over time. York Region also collects AADT on its arterials, and as many of the arterials in the City are regionally owned, requesting this data on an ongoing basis would also be helpful.

Annual Collision Data Collection. At the time of the task, the City did not maintain a database of data on collisions and received PDF reports of collision incidents as supplied by York Region Police. The implementation plan recommended collecting collision data from York Region Police on an ongoing basis and establishing clear procedures for cleaning and storing this data in a centralized database or geocoded map.

Impact: Collision data provides a measure of safety for vehicles, cyclists and pedestrians. Collecting and storing this data provides a record of previous collisions, their severity and their location, and allow for identification of where safety improvements may be warranted based on collision frequency.

Arterial Road Travel Time Data Collection. York Region operates a network of Bluetooth travel time sensors deployed throughout the Region on arterial roads under its jurisdiction, including 120 sensors located on arterial roads within the City of Vaughan. These provide live travel time data, refreshed every five (5) minutes, as an XML feed. The implementation plan recommended that the City develop a script to scrape live travel times from the XML feed and store the data. This would provide an ongoing source of arterial travel time data within the City and construct a historical database with minimal data collection effort.

Impact: Collecting travel time data over time will allow the City to understand how intensification and network improvements impact the ability to travel through and within the City. Additionally, as the data is collected over time, understanding seasonal trends and overall growth rates can help to inform decision-making.

In addition to these immediate needs, additional data collection and analysis activities were assessed for their impact to Vaughan's data collection program. The complete data collection whitepaper and consultation feedback is provided as **Appendix I: Data Collection Whitepaper**.

6 Empower Choice

Transportation choice is shaped by built form and land use, the relative safety, convenience and efficiency of infrastructure provided, and by past, learned behaviours. Relying on the private automobile for nearly all travel is the prevailing culture of Transportation in Vaughan today because of how the City was historically built. Developing a strategy to change existing travel

habits by Empowering Choice is central to achieving the VTP's vision to provide high-quality, attractive, competitive, and sustainable mobility choices to every resident, business and visitor in Vaughan. This chapter provides a brief overview of the VTP's approach to Empowering Choice by describing transportation culture today in Vaughan and program recommendations to encourage the use of sustainable modes, further to the Preferred Transportation Infrastructure Alternative.

6.1 Travel Patterns Today

Residents of Vaughan have developed a habit of primarily using cars for their transportation needs due to their ease and convenience. One of the goals of the VTP is to make individuals aware of alternative modes of travel so that they have the choice to choose a non-auto mode if it suits their needs. Encouraging the use of alternative transportation modes will lead to a decrease in the number of cars on the road, reducing the need for costly new roads and road expansions and decreasing greenhouse gas emissions.

As presented in **Figure 2-2** in **Chapter 2.2**, mode shares have remained largely unchanged from 2006 to 2016, which indicates opportunities to focus on improvements to the transportation network that provide people with competitive transportation travel options. **Chapter 2.2** describes the "induced demand" phenomenon, where widening or building more roads encourages more driving, and so, more congestion. To address this issue, new roads and road expansions should be designed with specific purposes in mind, such as serving new development areas or filling road network gaps, and should also enable other modes of travel, such as walking, cycling, or taking transit.

In addition to building targeted infrastructure that allows for convenient and safe use of multiple modes, the VTP also looks at strategies and programs to encourage the use sustainable modes. The best practice review and recommendations are summarized in the following sections.

6.2 Encouraging the Use of Sustainable Modes

As part of empowering choice, the VTP examined the opportunity to create a city-wide transportation options education and outreach program. This program is intended to complement existing efforts from the City and York Region, including:

- The City's New Transportation Demand Management (TDM) Guideline and Toolkit for new developments.
- Vaughan Active School Travel pilot program.
- Regional efforts, such as Smart Commute and the MyTrip Residential Travel Program.

This section reviews programs in other peer municipalities, an overview of existing programs and resources, and delivery models, including resource needs and focus areas.

6.2.1 Peer Municipality Program Review

The peer review investigated successful and comparable TDM programs for four municipalities: the City of Portland, the Region of Waterloo, the City of Vancouver, and the City of North

Vancouver. These programs share the goal of achieving changes in travel behaviour and culture. The following key lessons were observed from this review:

- Early involvement in city processes is crucial for securing funding and properly implementing and monitoring TDM programs. The City of Portland's program focus on residents, employers, and developers has enabled the team to tackle a range of factors influencing travel demand and implement effective strategies. Additionally, having the ability to scale programs and adequate staffing were highlighted as key factors for success.
- The Region of Waterloo implemented TDM in all aspects of transportation planning, which has allowed for development, transit promotion and climate action. Outsourcing the service delivery to a third party helped launch outreach activities during the pilot phase. The program's success is driven by the requirement of TravelWise membership to access corporate transit pass discounts. The Region of Waterloo's plan is to continue with employer TDM outreach and the corporate transit pass program and explore the inclusion of shared micromobility and car share in the program.
- The City of Vancouver also implemented their TDM program, which is primarily staffed in-house and supplemented by local non-profit organizations and consultants for added tasks. Future initiatives for residents will include incentives for public e-bikes, open street events, winter commuting campaigns, and community grants. For schools, the program will focus on encouraging youth transit use, campaigns targeting parents and high school students, resources for teachers, and expanding active travel school planning. Employers will have the opportunity to collaborate with local mobility providers, with added funding for existing promotional events and programs hosted by third parties in Vancouver.
- The City of North Vancouver implemented its GoCNV pilot to provide a proof-of-concept for residential-based TDM measures, which was implemented by an in-house TDM coordinator. The program reach was limited, but the coordinator recommended securing ongoing funding for the program and for outreach, as the return-on-investment is very high even for small programs.

6.2.2 Review of Existing Programs and Resources

This section summarizes existing and local outreach and education efforts within the City, for the purpose of mitigating duplicated efforts and gap identification, while also seeking to maximize synergies between existing programs on the regional and City levels and recommendations.

The Smart Commute program is the main TDM outreach program for residents and workplaces in Vaughan. It is primarily targeted at employers and commuters. The program used to be operated by Metrolinx with additional funding from regions and municipalities but is now operated by York Region in partnership with the City of Vaughan and other local municipalities. The program includes carpool ride-matching networks, Emergency Ride Home programs, discounted transit passes, and on-site outreach events and campaigns. The program is contracted to a local non-profit, pointA, to function as the 'Smart Commute North-Toronto Vaughan' transportation management association (TMA). The program was affected by a

decrease in funding since Metrolinx cut its funding and the effect of the COVID-19 pandemic on commuting patterns. York Region also offers a residential TDM program branded as 'MyTrip' and a school-based active transportation education program called Making Tracks. The Region also offers YRT Employer Pass Program and myRide Travel Training Program for customers who need added knowledge and skills to use YRT services.

The City of Vaughan has acknowledged the importance of TDM in its planning documents to accommodate a growing population and support TDM-related programs. The City's 2010 Official Plan, 2012 Transportation Master Plan and the Pedestrian and Bicycle Master Plan (adopted in 2020) all outline TDM strategies, including outreach, education, and awareness. The City has also mandated the preparation and implementation of TDM programs for all Site Plan approval applications for office uses greater than 2,000 square meters or residential apartment or mixed-use buildings greater than 50 residential units.

In 2021, the City introduced the TDM Guideline and Toolkit to provide guidance for new developments. The City of Vaughan has employed one full-time staff to execute TDM requirements and a program called Green Guardians was introduced in 2022 to encourage residents and businesses to get involved in city-led events or create their own community events that promote environmental stewardship. The City also introduced the MoveSmart Mobility Management Strategy in 2021 which proposes the creation of a Sustainable Mobility Program to provide a comprehensive approach to transportation and mobility in the city.

6.2.3 Recommendations

Three different implementation models were identified to encourage sustainable modes of travel in the City of Vaughan, with the possibility to combine elements of each model:

- **Model 1** is City-administered programming, where the city is fully in charge of program administration, hiring full-time staff to plan, deliver and evaluate the program.
- **Model 1a** is similar to Model 1, but with strong external partnerships with other organizations such as York Region, York Region Transit, Metrolinx, schools etc.
- **Model 2** is outsourced programming, where the program is outsourced entirely or partially to a for-profit or non-profit consultant or consulting team.

All models could be supplemented with grant funding to community-based organizations or individuals to help implement outreach and education programs, particularly for underserved population groups.

To have an effective outreach and education program, the following skills and support were noted, which could be delivered by a dedicated staff, staff in other departments (such as the City's Economic Development team), or through outsourcing to consultants and community partners:

- Program/project management.
- Outreach requires staffing and planning for events, challenges, educational opportunities.
- Graphic design to deliver digital and hard copy marketing materials.

- Communications to ensure that existing and new channels and tools needed to implement successful campaigns are used.
- Evaluation and reporting to demonstrate the value of the program, secure continued funding and to identify what approaches and strategies work best.

The City-led outreach and education program is focused on creating continuity across various transportation initiatives. The program's goals are informed by a number of transportation plans and strategies, including the 2021 'MoveSmart' Mobility Strategy, the 2020 Pedestrian and Bicycle Master Plan, and the 2019 'Green Directions Vaughan' Community Sustainability Plan. The program includes the following focus areas:

1. Amplifying Regional TDM Outreach Initiatives by aligning campaigns and education with regional programs.
2. Integrating Outreach with New Infrastructure Investments and Services by pairing education and outreach campaigns with ongoing cycling and transit infrastructure improvements.
3. Expanding Outreach to Populations Underserved by Regional TDM Programs by finding and targeting groups not previously included in existing programs.

The program aims to increase awareness of transportation options and decrease the impacts of construction on the transportation network while attracting users and market new infrastructure or service.

Measuring the effectiveness of a program to encourage sustainable travel modes is crucial in order to justify the program's budget, secure funding, and inform future plans. In the early stages of developing the program, it is important to establish program objectives and performance indicators. These objectives should be aligned with monitoring metrics from the VTP, such as VKT, changes in GHG, equity metrics (which are presented in **Chapter 8.3**), and also program specific indicators, such as labour, expenses, activities undertaken, participation metrics, changes in behaviour, and the cost required to induce the change in travel behaviour. Additionally, plan monitoring can inform whether TDM-related policies and guidelines require updates, particularly as transportation-related trends shift in the future.

6.3 Empower Choice: Actions and Initiatives

6.3.1 Supporting 15-minute Neighbourhoods in Intensification Areas

A 15-Minute Neighbourhood is a compact, well-connected place with a diverse mix of land uses. It is a complete community that supports active transportation and transit, reduces car dependency, and enables people to live car-light or car-free. New developments within these communities should provide more mobility choices by providing safe and accessible sidewalks and cycle tracks, as well as frequent and reliable transit. In these communities, it will be important for their long-term financial and environmental sustainability to plan for car parking only where it’s absolutely needed to encourage the use of sustainable modes and allow for other land uses.

Figure 6-1: Cycle Tracks at Vaughan Metropolitan Centre

As part of the VTP, a review was undertaken of Provincial and Regional policy that supports 15-Minute Neighbourhoods and other actions by peer municipalities to enable this land-use concept. Increased demand for compact urban design has increased proposals that include privately owned publicly accessible streets, and risks associated with these, such as lack of connectivity with non-private streets. However, benefits arise as these streets can help to enable the 15-Minute Neighbourhoods concept with the potential to bring connectivity, animation, and efficient land use, which fit with current planning objectives consistent with provincial, regional and local direction towards transit-oriented development.

Recommendations:

A key component of a complete community is the colocation of various uses: diverse housing, commercial/retail services including health care and food supply, employment and offices, community, open space, and recreational uses which are safe to reach within fifteen-minute walk.

The following recommendations were made as part of this analysis:

- Prioritize active transportation infrastructure and shared micro-mobility (e-bike and e-scooter) hubs near major transit station areas and key destinations,
- Coordinate with development to implement fine-grid street and active transportation networks to increase walkability and connections to transit and other amenities, and
- Apply the Vaughan Transportation Demand Management (TDM) Guidelines to implement improvements within new developments.

A preliminary paper of policy research for private streets is appended as **Appendix J: Preliminary Policy Research for Private Roads.**

6.3.2 Organizing Public Streets to enable more travel choices

Street classification designates streets into different groups based on the type of service and function they intend to provide. Traditional classifications systems, such as one currently used by the City and defined in the OP, categorizes urban city streets into three main categories based on the street's role and function in a transportation network:

- **Arterial Streets** form the concession block grid that provide overall structure to Vaughan's street network, with some being managed by the Region and others under the jurisdiction of the City;
- **Collector Streets** provide important linkages within the concession blocks created by arterial streets, managed by the City of Vaughan, and providing local transit, pedestrian and bicycle facilities; and
- **Local Streets** are low-traffic roads that accommodate pedestrians and cyclists.

Note that these also exist in major/minor levels (i.e., minor arterial, major collector). This traditional classification system focuses on vehicular movement and access, failing to recognize that multimodal streets must be sensitive to the surrounding environment.

Figure 6-2: Cycle Tracks along Clark Avenue in Vaughan

As part of the VTP, a new street classification system was proposed using best practices and in coordination with the on-going Vaughan Complete Streets Guidelines study. **Figure 6-1** summarizes factors that were considered in the development of the City's new street typologies.

Table 6-1: Considerations in the Development of Street Typologies

Considerations	Description
Functional Classification	Functional Classification is the City's current road network classification system and is generally based on the speed and volume of vehicular travel.
Urban Structure and Land Use	The City's Official Plan includes the urban structure designations and land use designation. From a street classification perspective, the urban structure is an important consideration in identifying a street's functional requirement and ensuring that the street classification system is aligned with the City's overall growth objectives. The consideration of land use provides a more granular view of an area; ensuring that the proposed modal priorities, cross-section elements, and rights-of-way fit the needs, function, and character of a neighbourhood.
Street Relationship (street-oriented vs. non-street-oriented uses)	The built environment in Vaughan shows many streets with different street frontage characteristics but hold the same functional classification and land use. Neighbourhood-facing streets with properties fronting the street vs. properties turned away from the street can influence the role of the street.
Existing and Proposed Transportation Network	Existing and planned walking, cycling, transit, and goods movement networks inform street typologies as each of these layers has distinct needs for different roadway users. The considerations include the City's Pedestrian and Bicycle Master Plan, York Region Transportation Master Plan, and Regional or Provincial Strategic Goods Movement Network(s).

This initiative resulted in a number of street typologies that consider both transportation function and land use context. These are identified below, in **Figure 6-3**. The full description for each street classification can be found in **Appendix K: Street Classification Whitepaper**, including their attributes such as urban structure designation and flow characteristics, as well as design considerations such as design speed, maximum number of lanes, ROW, modal considerations, and treatments for on-street parking and at intersections.

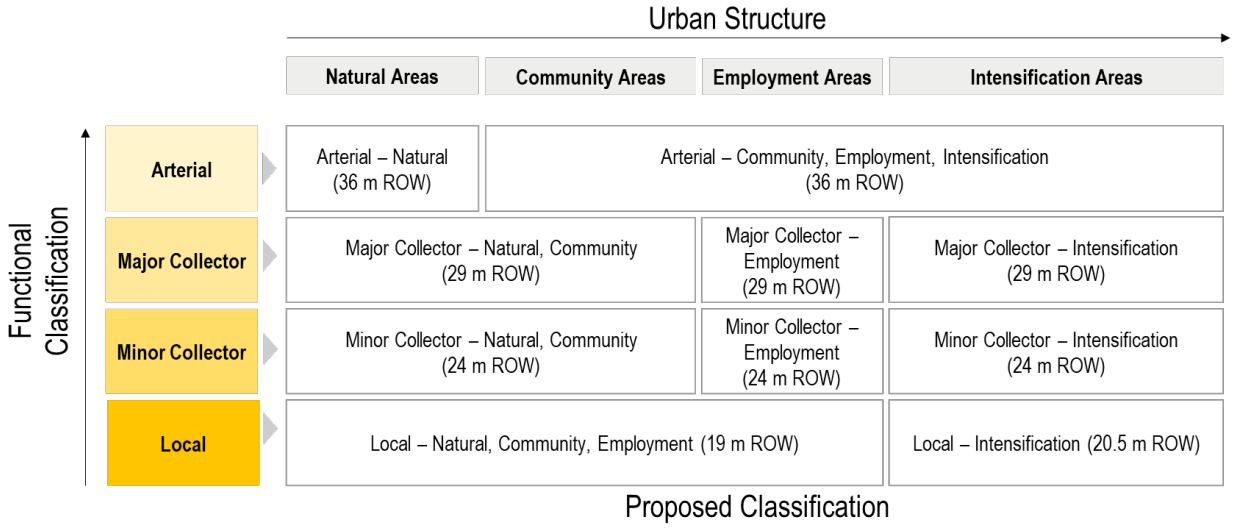


Figure 6-3: Proposed Street Classification

October 2023 - Note to Reader: The above figure (6-3) will be updated through the Vaughan Complete Streets and/or Vaughan Official Plan documents published after July 2023. Please refer to those documents for the most updated information.

The proposed street classifications and proposed rights-of-way in **Appendix K: Street Classification Whitepaper** are being further reviewed in the on-going Vaughan Complete Streets Guidelines study and their final forms will be incorporated into the City's Official Plan update.

These typologies were assigned to the preferred street network and is shown in **Figure 6-4**. Characteristics described in **Appendix K: Street Classification Whitepaper** should be reviewed in order to define street context and typology throughout all phases (i.e., planning, conceptual design, detail design) of a transportation project. Further information on the design of streets will be available, when completed, in the Vaughan Complete Streets Guidelines.

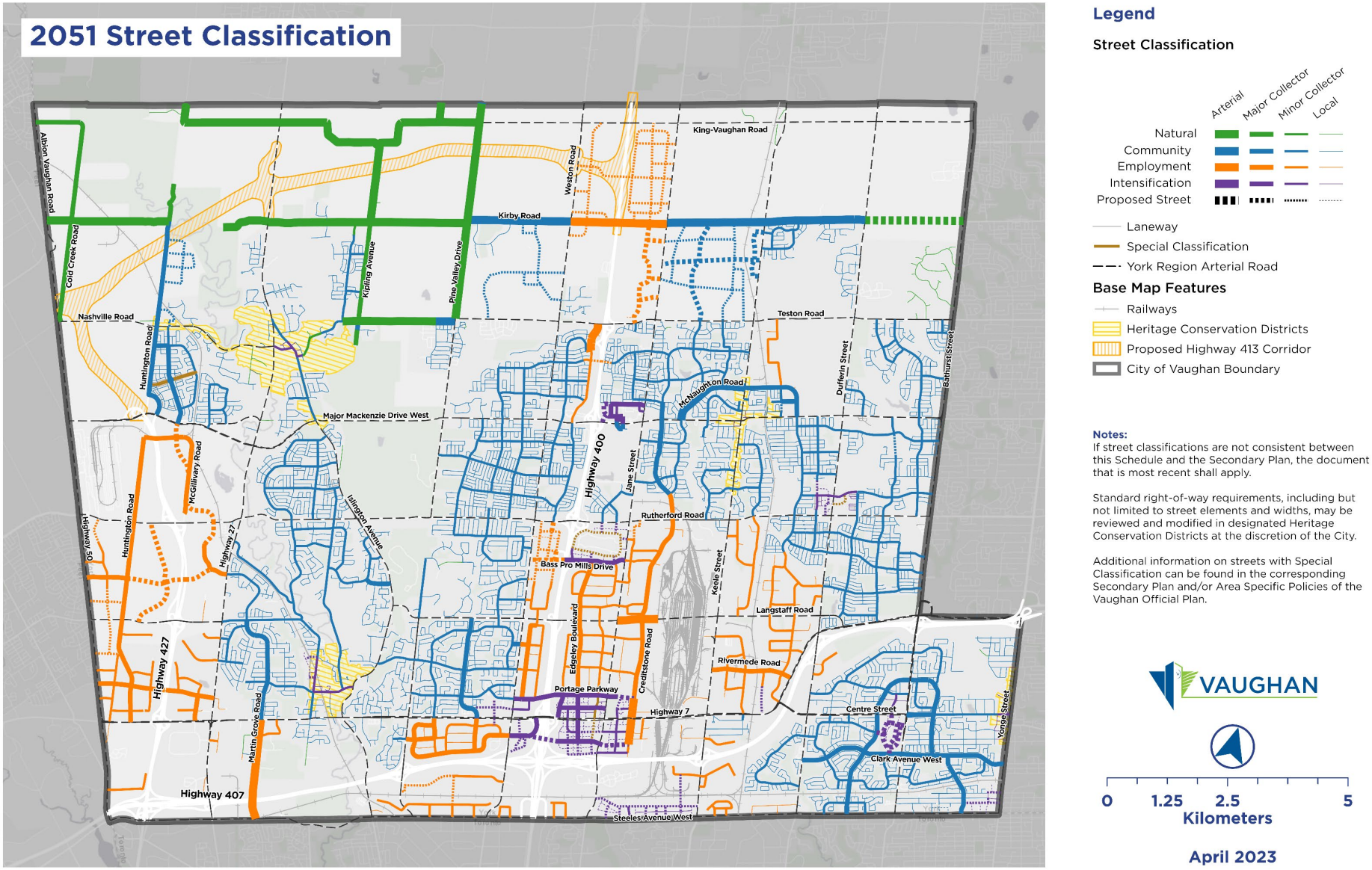


Figure 6-4: Proposed Street Classification Map

7 Think Forward

Built infrastructure plays a big part in mobility, but the transportation system involves more than just infrastructure. Thinking forward is the third direction of the VTP. This chapter describes supporting components of the transportation system which can help enable more mobility choices, prepare for future trends and evolve our use of existing and future infrastructure to maximize value for users. This involves conducting research on emergency trends (such as climate change, emerging technologies (such as autonomous vehicles) and finding creative solutions through existing infrastructure and data to move people and goods safely and efficiently. This chapter discusses the following topics in its sub-chapters:

- **Chapter 7.1** examines how to maximize value from transportation infrastructure by looking at alternative uses and revenue-generating opportunities.
- **Chapter 7.2** examines how sustainable goods movement can be achieved.
- **Chapter 7.3** summarizes research, consultation and innovation management framework for future mobility.
- **Chapter 7.4** lists additional further investigations on transit and aerial mobility.

7.1 Maximize Value from Transportation Infrastructure

Maximizing value from transportation infrastructure means finding ways to take advantage of the City's existing transportation assets or preparing to leverage new ones. This could involve social benefits, such as flexible road closures for events, curbside management for multiple uses, or revenue generating for the City that can be reinvested into transportation services. An example is an on-street Electric Vehicle (EV) charging streetlight, shown below in **Figure 7-1**.

Figure 7-1: Example of On-street Electric Vehicle Charging Streetlight

As part of the VTP, a best practices review was undertaken of a wide variety of measures relating to maximizing the usage of the City's infrastructure assets and potential monetization opportunities.

The value-maximizing measures reviewed included:

- Curbside management
- Congestion pricing
- Gondolas
- Low and Zero Emission Zones
- EV charging streetlights
- Shared and micro-mobility
- Mobility-as-a-Service permits
- Flex Streets and temporary road closures
- Automated Speed Enforcement

Review and consultation were undertaken with City staff, and the most implementable opportunities are presented in **Appendix L: Maximizing Value for Transportation Infrastructure Whitepaper**, along with a description, potential benefits, and challenges to implementing them.

Table 7-1: Maximizing Value for Infrastructure, Benefits and Risks

Infrastructure	Description	Potential Benefits	Challenges for Implementation
Curbside Management	The curb is a shared multi-purpose space that separates the roadway from the sidewalk. The curb has typically been used for vehicle loading and delivery, on-street parking, and pick-up and drop-offs. However, the use of the curbside, particularly the frequency of use is changing due to evolving market sectors such as transportation (Uber, Lyft, etc.) and e-commerce (Amazon, Shopify, Etsy, DoorDash, etc.). Management of the supply and demand of the curb is critical in maximizing existing infrastructure value, particularly in intensification areas. Strategies to manage curbside space include: • Time of day and specific use restrictions, • Dynamic parking prices, and • Parklets, small seating areas or greenspaces that are typically created along a sidewalk.[8]	**Time of day and specific use restrictions** • Permits for ride-hailing and courier/delivery companies reduced vehicle demands in the city core. • Improved curbside management for local businesses (i.e., curbside loading activities • Increased capacity for accessible vehicles. • Decreasing GHG emissions by incentivizing EV/accessible vehicles through discounted permit fees for ride-hailing vehicles. **Dynamic Parking Prices** • Improving parking utilization of off-street and on-street facilities. • Distributing parking demand throughout the day to reduce congestion during peak hours. • Improving urban mobility and improving customer experience. **Parklets** • Increased in the vibrancy of streets and social activity. • Support for the local economy. • Created a safe space for people to gather and socialize. • Increased of pedestrian and cyclist traffic in parklet areas.	**Time of day and specific use restrictions** • Non-courier and non-delivery vehicles stopping/parking in designated loading zones. • Parking and stopping violations may still occur. • Parking enforcement may not catch all parking violators. **Dynamic Parking Prices** • Easy to underestimate the scope, magnitude, and technological sophistications needed. • Incomplete data sharing between on street and off-street facilities and parking information systems may result in inaccurate/inappropriate parking rates • Lack of staff, consultants, and contractor expertise to operate and maintain new parking technologies and parking information systems. **Parklets** • Since parklets are public spaces, the municipality is liable for health and safety incidents within parklets. • Due to limited city funding and staff capacity, the City of Vancouver was not able to keep up with growing demands from restaurants and cafes.

[8] National Association of City Transportation Officials. (2013, July 11). Parklets. https://nacto.org/publication/urban-street-design-guide/interim-design-strategies/parklets/

Infrastructure	Description	Potential Benefits	Challenges for Implementation
EV Charging Streetlights	Public EV charging streetlights can reduce range anxiety associated with hesitation to purchase electric vehicles, encourage higher uptake in EVs, and help cities reduce emissions. Streetlights/light poles can be retrofitted with energy-efficient LEDs to save energy over conventional high-pressure sodium lightbulbs. The excess power can be transferred to electric vehicle (EV) charging infrastructure, and customers pay through meters or smartphone applications. Other benefits of EV charging streetlights from cities' perspective include space efficiency (no extra street furniture), high scalability, low investment and operation costs, and ease of relocation if necessary[9].	• Increases accessibility to charging stations to consumers without access to off-street home charging. • Increases adoption rate of EVs and reduces dependence on fossil fuels. • Reduction in GHG emissions. • Supports the goal of addressing climate change through reduction in GHG emissions and air pollutants.	• Most charging products in the market are not Measurement Canada and CSA certified. Products may need to be retrofitted/inspected to ensure accurate metering to satisfy Measurement Canada standards and will need to meet safety, performance, and compliance requirements of CSA [10, 11]. • Ownership structures and existing regulations/acts may result in complexities and delays in implementing pilot projects.
Shared and Micro-Mobility and Mobility-as-a-Service	Mobility-as-a-Service (MaaS) is the integration of various forms of transportation services into a single mobility service that is accessible on demand[12]. MaaS offers commuters value with a central application to provide access to mobility, with a single payment channel instead of multiple ticketing and payment	• Supports accessibility and connectivity objectives by increasing access to transportation options for commuting and discretionary trips. • Supports environmental stewardship objectives by providing first- and last-mile option.	• Moderate risk of equity challenges as these would come at a cost to providing a first-/last-mile connection that may add to existing trip costs. • Moderate risk of accessibility as elderly or disabled populations may find difficulty accessing these services due to physical or digital barriers. The City of Oakland piloted

[9] Expand your EV infrastructure with lamp post charge points. (2020, October 19). Ubitricity - on-Street Charging Solutions |. https://www.ubitricity.com/chargepoints/

[10] Government of Canada, I. (n.d.). Electric vehicle charging stations [Guides]. Innovation, Science and Economic Development Canada. Retrieved November 23, 2022, from https://www.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm04949.html

[11] Electric Charging. (n.d.). CSA Group. Retrieved November 23, 2022, from https://www.csagroup.org/testing-certification/product-areas/power-generation-energy-storage/vehicle-power-fueling/electric-charging/

[12] What is MaaS? (A brief introduction into Mobility-as-a-Service)—Evozon—Custom software development, customized IT solutions. Cluj Napoca, Romania. (n.d.). Retrieved November 23, 2022, from https://www.evozon.com/what-is-maas-a-brief-introduction-into-mobility-as-a-service/

Infrastructure	Description	Potential Benefits	Challenges for Implementation
	operations[13]. Shared mobility refers to the shared use of a vehicle, motorcycle, scooter, bicycle, or other travel modes that provide the user with short-term access to one of these modes of travel as they are needed. Micro-mobility refers to a vehicle that is low speed (under 50 km/h), lightweight (less than 45 kilograms), and can be personally owned or part of a shared fleet. Shared and micro-mobility offer multi-modal solutions for users and form part of a larger integrated transportation network, particularly as first and last-mile solutions for public transit. These emerging technologies are discussed further in **Chapter 7.3**.	• Supports equity objectives by providing a low-cost and "on-demand" transportation option.	an adaptive bike share for people with disabilities in 2019 (specifically wheelchair users)[14]. • High risks relating to safety and liability, as many users may be inexperienced or recreational and unaware of regulations. Managing joint and several risks is necessary when partnering with operators. • High risks relating to vendor performance and availability, as many micromobility devices lack regulation and industrial standards (lead to variations in speed between vehicles of the same class). Additionally, shared operation of these modes is a fairly new service concept, and reputable vendors may be lacking in the market and may require greater oversight and monitoring from the City.
Flex Streets and Temporary Street Closures	Flexible ("Flex") streets are streets designed to easily transform from primarily travel/transport uses to economic and community uses. Flex streets can be designed with no curb or grade separation or quickly redesigned through signage, paint, flexible or movable bollards, and temporary closures. Seasonal, time-of-day, and day of the week closures or flexible uses can be determined by the municipality or in partnership with BIAs, neighbourhood groups, and	• Significant opportunity to support employment creation and economic impact, supporting and increasing access to vibrant public spaces. • Transit Priority corridors present significant opportunities in supporting improved transit experience for users. • Strong alignment with local plans related to active and sustainable communities.	• Significant risk from funding availability and schedules; may require quick turnaround from concept to implementation. • Moderate risk from political opposition; concerns from parking removal. • Low risk from compliance and enforcement and seasonal weather consideration. • Low risk from concerns from local businesses on lack removal of parking.

[13] Protocol, T. (2019, June 19). What is Mobility as a Service? Medium. https://medium.com/@transitprotocol/what-is-mobility-as-a-service-672259066c87
[14] Adaptive Bike Share. (n.d.). City of Oakland. Retrieved November 23, 2022, from https://www.oaklandca.gov/news/2019/adaptive-bike-share

Infrastructure	Description	Potential Benefits	Challenges for Implementation
	local businesses. Typical flexible uses include play streets, pedestrian and cycling streets, markets, and open streets.		

Recommendations

The opportunities in Chapter 7.1 can be investigated further individually based on their applicability and alignment with the VTP's overall transportation vision. In particular, the following actions related to these opportunities are recommended:

- Investigate dynamic parking pricing in areas with high curbside activities,
- Allow parklets on City land in areas with front-facing retail,
- Install electric vehicle chargers in residential areas or areas with high curbside activity, and
- Explore flexible streets and temporary road closures to enable public events and festivals.

The full report is provided as **Appendix L: Maximizing Value for Transportation Infrastructure Whitepaper**.

7.2 Support Sustainable Goods Movement

The City of Vaughan is strategically located for freight and freight-dependent companies. Location quotients compare the concentration of an industry within a specific area to the concentration of that industry nationwide. An industry with a location quotient above 1.2 is deemed to have a significant concentration. According to the City's Economic and Cultural Development department, Vaughan's freight dependent construction, manufacturing, transportation and warehousing and wholesale trade industry sectors have a location quotient above 1.21.

Key attributes of the City that attract freight-related businesses include:

- Proximity to population and commerce centres,
- Proximity to intermodal rail facilities, with two within the City itself, Canadian Pacific (CP) Vaughan Intermodal Terminal and Canadian National (CN) Macmillan Yard,
- Access to Pearson International Airport and international and domestic air cargo services, and
- Access to highway networks, including the provincial Highway 400 and Highway 427, as well as the 407ETR toll highway.

As part of the VTP, a review was undertaken to highlight freight-related practices and actions from across North America and Europe that seek to better manage and improve freight movement and reduce freight impact on communities and neighbourhoods. New emerging modes are being used for goods movement, including drones and cargo e-bike, shown in **Figure 7-2**.

Figure 7-2: Example of Cargo Bike Delivery

Recommendations:

Goods movement involves noise, emissions, congestion, comfort and safety concerns for vulnerable road users, and accelerated wear on roads. The below recommendations can help to introduce mitigation measures to these impacts while balancing the efficient movement of goods and services by strategically targeting improvements to freight on specific corridors by partnering with York Region, the province, and industry. These improvements will also tie in with Complete Street strategies, further discussed in **Chapter 6.3.2**. Based on this review and inputs from stakeholder engagement, the following recommendations for further consideration were made:

- Develop safer fleet practices, including goods movement vehicles designed to mitigate risks and impacts to vulnerable roadway users,
- Develop a goods movement strategy and truck route network, in collaboration with York Region, Peel Region and other partners, to allocate trucking movements to compatible areas,
- Partner with interested businesses to pilot cargo bike operations in urban areas of Vaughan,
- Consider safer fleet practices within the City of Vaughan's fleet operations, including vehicles designed to mitigate risks and impacts to vulnerable roadway users,
- Formally incorporate freight activities within Complete Street strategies, and
- Develop a formal freight forum to assist with future freight strategies and other plans and developments within the City of Vaughan.

The full report on Goods movement is provided as **Appendix M: Goods Movement Whitepaper**.

7.3 Investigate Future Mobility

Future mobility (often referred to as “New Mobility”) refers to “a service, mode, transportation infrastructure or a combination of these that leverages new digital communication platforms and data to connect travellers to mobility options to move, share and use the transportation infrastructure”.[15]

Figure 7-3: Autonomous Shuttle in Helsinki, Finland

The following subsections provide a review of future mobility technologies and services, which are followed afterward by a summary table of their benefits, risks, and implementation challenges. The full report is available as **Appendix N: Future Mobility Whitepaper**.

7.3.1 Review of Technologies and Services

New Mobility holds both significant potential benefits and risks for the transportation network. As part of the VTP, technologies and services that involve future mobility were researched in detail. A summary of these is presented in on the following page.

[15] Alameda County. (2020). New Mobility Roadmap: A guide for the future of mobility in Alameda County. Alameda County Transportation Commission. https://www.alamedactc.org/wp-content/uploads/2020/11/Alameda-County-New-Mobility-Roadmap-FINAL.pdf

New Mobility Technology / Service	Description	Potential Benefits	Implementation Challenges
Connected and Automated Vehicles (CAVs)	Connected and Automated Vehicles (CAVs) involve two main components: automation of aspects of the driving system (either for specific features or for the entire process), and connectivity with other vehicles (called "V2V"), infrastructure ("V2I") and everything ("V2X"), which can include pedestrians and cyclists.	Benefits speculated for CAVs include improved road safety, decreased congestion, reduced per-kilometre costs, increased accessibility, and increased fuel efficiency.	The transition to AVs may be difficult as road users may lack familiarity with these types of vehicles, and standards may be lacking. Additionally, depending on how policy is shaped around CAVs, vehicle-kilometres travelled could increase (leading to increased congestion), as the driving task is no longer required and they can complete other tasks (such as reading, or sleeping).
Electrification	Electrification of mobility refers to replacing the current system of using fossil fuels as the energy source for internal combustion engines (ICEs) with electricity stored in batteries or hydrogen to power Electric Vehicles (EVs). Transportation is the highest contributor to greenhouse gas (GHG) emissions across all industries. Therefore, electrification has a high potential to reduce the environmental impact of transportation, but also many barriers to widespread adoption.	Benefits of electrification include user cost savings, allowing for updated energy sources other than fossil fuels (since electricity can be generated in many ways), and a reduction in greenhouse gas (GHG) emissions.	However, existing infrastructure may not be designed to support transportation systems that rely on them heavily. This includes charging infrastructure, which may not support long-range trips, and battery infrastructure, which falls short in colder weather. Additionally, taxes from gasoline and diesel are often used to fund transportation services, and the revenue from these may decrease over time.
Shared Mobility / Micromobility	According to the Society of Automotive Engineers (SAE), shared mobility is "the shared use of a vehicle, motorcycle, scooter, bicycle, or another travel mode… [that] provides users with short-term access to one of these modes of travel as they are needed".[16] It is a blanket term that covers the sharing of all of these modes, which can involve sharing of a vehicle between many individuals (e.g., bicycle or scooter), or sharing a ride with another person. Micromobility involves vehicles that are low-speed (under 50 km/h), lightweight (less than 45 kilograms) and can be personally owned or part of a shared fleet.[17] During the COVID-19 pandemic, many chose to	Micromobility has numerous benefits, including complementing public transit use and providing a solution to the first-last mile problem, reducing the need for personal vehicle ownership, and encouraging active transportation, which promotes public health.	However, these modes have equity challenges, as there may be physical barriers from being able to use them effectively. These new modes will require right Additionally, there is a lack of regulatory and design standards, where speeds vary drastically, and priorities of public interests of health, safety and liability should be maintained over travel efficiency.

[16] Society of Automotive Engineers International. (n.d.). Shared Mobility. Retrieved November 2, 2022, from https://www.sae.org/shared-mobility/
[17] Fischer, P. S. (2020). Understanding and Tackling Micromobility: Transportation's New Disruptor. Governor's Highway Safety Association.

New Mobility Technology / Service	Description	Potential Benefits	Implementation Challenges
	use micromobility as it provides a low-cost travel alternative that is physically distanced.		
Application of New Mobility to Goods Movement	Goods movement involves many different modes and will be impacted by future mobility. In Ontario, goods movement is foundational to the economy, and nearly 40% of the economy consists of industries that are goods movement intensive (e.g., manufacturing, retail, forestry, mining, construction).[18] In 2016, Ontario's transportation system carried 56% of Canada's international trade, and 66% of Canada-US trade.	New modes are being developed and used for goods movement, including drones, cargo e-bikes and autonomous delivery. New mobility can help solve the first-/last-mile problem, as these new modes can automate getting a delivery directly to the consumer using e-bikes or drones. With automated trucks, platooning will also be possible, where vehicles can be connected to increase efficiency, bringing cost savings to operators. Electrification of goods movement is also ongoing and will reduce overall GHGs.	New modes for goods movement will require right-of-way room, and temporary curbside space. Additionally, operators may be hesitant to replace their fleet with new mobility technologies, which can be expensive and/or unproven.
Smart Cities	Smart cities refer to the use of technology to enhance the quality of life for citizens and promote sustainable development.[19] The smart city concept involves linking municipal services and systems through the Internet of Things (IoT) sensor technology to support greater citizen interaction and government efficiency. The spending for smart city initiatives is forecasted to more than double between 2018 and 2023, from $81 billion USD to 189.5 billion.[20]	Potential benefits include real-time data collection to drive responses to incidents in real time (such as intelligent transportation systems management and operations to dynamically route traffic), demand-based pricing based on real-time measurement, and increased interaction and participation in government.	To realize these benefits, however, supporting infrastructure is required, and platforms to manage and share data effectively in real-time. Additional risks also arise when sharing data
Mobility-as-a-Service (MaaS)	MaaS is described as "a distribution model that delivers users' transport needs through one single interface of a service provider, combining different transport modes	Some benefits of MaaS include capacity optimization within the transportation network, better intermodal connectivity, and trip	There are infrastructure barriers and significant data sharing requirements needed to enable this service concept.

[18] Casey, M. (2019, November 4). Initiatives Supporting Ontario's Goods Movement. Smart Freight Symposium.
[19] Ismagilova, E., Hughes, L., Rana, N. P., & Dwivedi, Y. K. (2022). Security, Privacy and Risks Within Smart Cities: Literature Review and Development of a Smart City Interaction Framework. Information Systems Frontiers, 24(2), 393–414. https://doi.org/10.1007/s10796-020-10044-1
[20] Statista. (n.d.). Smart city initiatives global spending 2018-2023. Statista. Retrieved November 2, 2022, from https://www.statista.com/statistics/884092/worldwide-spending-smart-city-initiatives/

New Mobility Technology / Service	Description	Potential Benefits	Implementation Challenges
	to offer tailored mobility packages ".[21] Although the interpretation and description vary, MaaS is intended to improve the consumer mobility experience by integrating information, payment, services, and policies.	planning, increased private-sector opportunities, and user cost savings.	
Mobility Hubs	A Mobility Hub is an integrated mobility interchange for multimodal systems.[22] These hubs are conceptualized to leverage emerging technologies and improve transportation efficiency, providing a single access point for multimodal systems such as bike-sharing, ridesharing, and car-sharing. Mobility Hubs are envisioned to serve as intermediate transfer points between transit hubs and trip ends. They can also range in size and scale, from a small bike/scooter sharing station with a bus stop to an on street car-sharing station.	Some of the benefits of mobility hubs can include providing a first-/last-mile solution for trips, decreasing single-occupant vehicle (SOV) travel, establishing public-private partnership to operate these hubs, and providing additional travel choice and capacity without needing significant network expansion.	These hubs involve integrating multiple modes, and the number of potential conflict points and wayfinding difficulties increase. Coordinating various parts of a traveler's trip allows this conceptual hub to function effectively. These parts may include payment, reservation for shared modes, and information. Without these elements being integrated seamlessly, using a mobility hub as interchange may not be an appealing mobility option.

[21] Arias-Molinares, D., & García-Palomares, J. C. (2020). The Ws of MaaS: Understanding mobility as a service fromaliterature review. IATSS Research, 44(3), 253–263. https://doi.org/10.1016/j.iatssr.2020.02.001

[22] City of Toronto. (2017). ConsumersNext: Final Report. City of Toronto. https://www.toronto.ca/legdocs/mmis/2017/pg/bgrd/backgroundfile-104042.pdf

7.3.2 Consultation with Agency Partners

After researching New Mobility technologies and service concepts to gather a baseline understanding of what is on the horizon, consultation with agency partners was undertaken in order to initialize a conversation on the topic. A questionnaire was developed and circulated to the City of Toronto, Ministry of Transportation for Ontario (MTO), Transport Canada and York Region. Responses were received in questionnaire format from MTO and York Region, and meetings were held with the City of Toronto and Transport Canada to discuss New Mobility in a similar format. The responses are summarized in **Table 7-2**.

Table 7-2: New Mobility Consultation with Peer Municipalities

New Mobility Topic	Feedback heard
New Mobility Technologies	CAVs and Electrification were noted to be major focus areas for all municipalities. Other focus areas, however, were noted to vary by jurisdiction. Micromobility was an example of this, where local municipalities were responsible to legislate their use.
Planning for New Mobility	Several gaps to implementation were noted by respondents: • **Regulatory Frameworks, Liability and Minimum Maintenance Standards** – Current legislative frameworks currently assume that a human is in control of the driving task, which will need to be updated in the future. • **Costs and Procurement** – Municipalities have limited capital and operational budgets to provide transportation services, and there is a lack of GTHA-wide standards to define consistent requirements. For new technologies, there are few reliable and practical vendors. • **Talent and New Skills** – To understand, plan for, and integrate new mobility technologies, infrastructure and service concepts, there is a requirement for a skillset that goes beyond the typical civil engineering discipline and scope of knowledge • **Physical Infrastructure Gap** – There is currently a lack of public Electric Vehicle Supply Equipment (EVSE) infrastructure, particularly fast chargers, which support long-distance travel. A lack of EVSE was also noted in northern/rural Ontario, non-residential buildings, and multi-residential buildings.
Policies and Initiatives	For certain technologies such as micromobility, legislation is downloaded to municipalities to pass their respective by-laws. Transport Canada is working actively to produce regulation on noise requirements for EVs (to allow the visually impaired to know when EVs are nearby), and consultation on low-level automation and driver assistance to see which other technologies to prioritize for regulation. Partnerships are also being evaluated, as sectors are changing to reflect changes in the market. “Invitation to Partner” is a new type of procurement and adding negotiated RFP (which adds a negotiation period to the regular RFP period) is an effective way to add flexibility to procurement. Partnering with private companies allow public agencies to benefit from expertise and efficient and innovative solutions, while allowing for risk transfer. Equity and accessibility are also a focus, as transportation should be available for all. For many projects, equity lenses are being applied to look at where investment has been focused historically, and neighborhood improvement areas where improvements could be made.

7.3.3 Review of Existing New Mobility Initiatives

7.3.3.1 VAUGHAN SHARED MOBILITY FEASIBILITY STUDY AND PILOT

The City completed a study in 2019 to complete a first/last mile solution feasibility study to reduce the reliance on the park-and-drive mode at Rutherford GO by offering other access modes. The study was motivated by significant construction activity near Rutherford GO that would worsen congestion and disrupt parking and traffic flow in an already busy corridor. Four main alternatives were assessed: micro-transit or On Demand Micro-Transit (ODMT), AV shuttles, TNC partnerships, and micro-mobility. These alternatives were evaluated according to a framework built on measuring how well these solutions address strategic financial, economic, and market-readiness goals.

The following findings resulted from this study:

- All four levels of government (the City, York Region, Metrolinx/MTO, Transport Canada) support innovative mobility solutions at transit stations like Rutherford GO. York Region would be the primary partner for any pilot as it has exclusive authority over public transit,
- The proposed service area includes 75,000 residents who also make up nearly two-thirds of Rutherford GO drive-and-park users,
- ODMT was the recommended mode as it can serve the service area effectively, can be delivered with low environmental impact, and is a proven market-ready solution with earlier pilots in the GTHA,
- Potential cost estimate of $323,000 (50% provided through grant funding from higher levels of government) for planning, operations, and evaluation over a period of 21 months, and
- Performance monitoring was identified as a key item that will ensure high-quality service and expertise to build out similar future first/last mile services at similar nodes in the City.

In June 2020, the City summarized findings from the abovementioned study for a Shared Mobility Pilot. This service mode supplies benefits that include access to a more sustainable mode, but also a mode that keeps physical distancing, drawing from lessons learned from Belleville's public transit in response to COVID-19. The City will look to partner with York Region Transit to pilot this service.

The City has also developed an implementation plan for ODMT service:

1. Service Delivery - ODMT service would run as first/last mile transit feeder within the Rutherford GO study area, with virtual stops (not door-to-door), turnkey operation by a contractor, and fare consistent with YRT (and a $1 fare for Presto cardholders connecting to/from GO service).
2. Public Engagement - The City identified six phases for the implementation of ODMT and has engagement plans for outreach and marketing of the service.
3. Performance Monitoring - Service performance will be monitored from three perspectives: the customer, the City, and wider society. It will monitor the travel

experience, cost-effectiveness, and wider impacts such as shifts in VKT, reduction in GHG emissions, and effectiveness in mode shift.

Additional information on this program can be found on the City's website.

7.3.3.2 SMART CITY - VAUGHAN

As the City continues its evolution, Smart City has been identified as a strategic priority in the 2018-2022 Term of Council Service Excellence Strategic Plan. A smart city uses technology to solve civic challenges, provides businesses with a climate for growth, improves the citizen experience and enhances the quality of life.

The City's Smart City Task Force had an overall mandate to make recommendations to ensure the City is advancing a culture of knowledge and continuous improvement. The first Smart City Task Force's efforts led to budget approval of a new Smart City study to aid in the establishment of Vaughan's first-ever Smart City business unit within the Economic Development department.

7.3.3.3 ACTIVATE!VAUGHAN SMART CITY CHALLENGE

In February 2021, the City's Economic and Cultural Development launched the Activate!Vaughan Smart City Challenge, which is a pitch competition designed to connect high-potential start-ups and scale-ups to entrepreneurship opportunities and mentorship. The Smart City Challenge focuses on four main themes: Electric Mobility, Municipal Services Route Optimization, Age-Friendly Communities, and Intelligent Placemaking.

In 2022, Vaughan Council approved the Smart City Task Force's findings and recommendations report, including an approved Smart City vision, guiding principles, strategic objectives, a framework and project prioritization for the 2022-2026 Term of Council.

7.3.4 Recommendations

Policy development is centered around common focus areas for new mobility, such as cybersecurity and privacy, electrification, micromobility. For certain technologies such as micromobility, legislation is downloaded to municipalities to pass their respective by-laws. Transport Canada is working actively to produce regulation on noise requirements for EVs (to allow the visually impaired to know when EVs are nearby), and consultation on low-level automation and driver assistance to see which other technologies to prioritize for regulation.

Partnerships are also being evaluated, as sectors are changing to reflect changes in the market. "Invitation to Partner" is a new type of procurement and adding negotiated RFP (which adds a negotiation period to the regular RFP period) is an effective way to add flexibility to procurement. Partnering with private companies allow public agencies to benefit from expertise and efficient and innovative solutions, while allowing for risk transfer.

Equity and accessibility are also a focus, as transportation should be available for all. For many projects, equity lenses are being applied to look at where investment has been focused historically, and neighborhood improvement areas where improvements could be made. York Region has commissioned a research paper on transportation equity, which will be shared with the City.

As noted in **Table 7-2**, three primary types of gaps were identified from consultation:

1. **Regulatory gaps:** A gap in legislation or missing framework to define standards or categorize New Mobility technologies or services.
2. **Infrastructure gaps:** A gap identified in infrastructure required to enable New Mobility technologies, either physical or a missing standard.
3. **Resource gaps:** A gap that involves a missing resource required to deliver New Mobility projects or programs, such as talent or funding.

Table 7-3 summarizes New Mobility recommendations that were provided as part of this task.

Table 7-3: New Mobility Recommendations

New Mobility Gap/Area	Recommendation
Regulatory Gap – Micromobility	Short-term: • Engage with other municipalities and levels of government. • Define where and how micromobility devices can be used in the City (**Complete**). • Develop a "New Mobility Policy" to commit the City in managing and accommodating future mobility to support sustainable transportation and environmental objectives and establishing a Transportation Innovation Program (described in **Chapter 7.3.5**). Medium-/Long-term: • Consult with the public and other local stakeholders on their interests and conduct pilots to evaluate technologies and collect data. • Determine where these technologies can operate and how they can be regulated based on the pilots and other best practices. • Leverage micromobility more widely as a first-/last-mile connection through mobility hubs.
Regulatory Gap – Connected Infrastructure Cybersecurity and Privacy	Short-term: • Coordinate with IT staff to review existing projects' threat and risk assessments and opportunities for improvement for future projects that involve data collection. • Identify opportunities to incorporate Privacy Impact Assessments for new projects, a risk management process that helps institutions meet legislative requirements.[23]
Regulatory Gap – Vehicle and Infrastructure Standardization	• Continue to collaborate with other municipalities, organizations (e.g., CUTRIC) and industry.
Infrastructure Gap – Electric Vehicle Charging Infrastructure	Short-term: • Propose requirements for EV charging or providing the necessary connections to install EV charging for new developments and in policy language for Secondary Plans. • Support EV charging retrofit programs and opportunities such as EV charging streetlights (described in **Chapter 7.1**). • Coordinate with utility companies to ensure that the network is able to support growing EV charging demand. • Support the Goods movement industry's transition to electric fleets.

[23] Office of the Privacy Commissioner of Canada. (2020). Expectations: OPC's Guide to the Privacy Impact Assessment Process. Ottawa, ON. Government of Canada.

New Mobility Gap/Area	Recommendation
	• Lead by example by conducting a study to transition its own municipal fleet to zero-emission vehicles. Medium-/long-term: • Coordinate with other municipalities and agencies to identify and install charging infrastructure to support long-distance travel.
Infrastructure Gap – Roadway Design and Implementation Standards for AV	Short-term: • Continue to participate in OVIN, Ontario Smart Mobility Readiness Forum, and other public forums to stay informed on emerging trends in transportation relating to CAV. • Participate and contribute to conversations surrounding implementation standards and roadway design, with transportation staff on technical advisory committees to provide City-specific perspectives for new standards. Medium-/long-term: • Support development of GTHA-wide design, operations and standards for CAV and requisite connected infrastructure to support them, ensuring that the City is well positioned for these newer modes.
Resource Gap – Capital and Operational Funding	Short-term: • Investigate funding sources, such as the Enhance Road Safety Transfer Payment Program by Transport Canada, or the Smart Cities challenge, which could be used to fund studies. Medium-/long-term: • Identify annual budget for new mobility studies and infrastructure spending to address regulatory and infrastructure gaps. • Identify opportunities to bundle new mobility opportunities and infrastructure into wider studies, such as secondary plans, EAs and other residential development.
Resource Gap – Staffing, Resources and Talent	Short-term: • Ensure that existing staff are monitoring new mobility technologies on the horizon (e.g., CAV, Micro-mobility, Electrification, shared mobility), and including them in the planning process. Medium-/long-term: • Assign new mobility programs (e.g., a micromobility program, CAV program, shared auto program, etc.) to specific staff to manage, and take on additional staff to support or lead these initiatives, as needed. • Investigate taking on staff with additional capabilities beyond the typical transportation engineering skillset (e.g., data science, artificial intelligence, advanced transportation systems).

Additionally, three near-term opportunities were identified as “quick-wins”:

1. Shared micromobility (shuttle) or on-demand micro transit (ODMT) pilot focused on serving the West Vaughan employment area, which has a warehouse/industrial focus. This service could connect major employers (e.g., Costco, Home Depot, in the area and connect to higher order transit to ensure that employees have frequent (or on-request) service.
2. ODMT service to connect directly to planned rapid transit projects in Vaughan, leveraging lessons learned from the ongoing Rutherford/Maple GO procurement process and service operation.

3. Mobility hub concept implementation and electric micro-mobility TIPs within new development areas such as Weston and Highway 7, Vaughan Metropolitan Centre, Promenade Centre, and Vaughan Mills as intermediate connections between major rapid transit stops to final destinations. These could be used to pilot new modes to bridge the first-/last-mile connection to high-order rapid transit options.

The City should continue to monitor areas of focus for higher levels of government and downstream funding to support pilots that have potential benefit to provide additional travel choices to residents and visitors, in alignment with the VTP's vision.

7.3.5 Vaughan Transportation Innovation Program

Future Mobility requires a different method of testing and implementation, and new modes or services should be trialed and evaluated prior to wider use to ensure safety for vulnerable road users. The purpose of the Transportation Innovation Program (TIP) is to guide and manage the implementation and development of new technologies.

After a technology or service completes the TIP, further procurement or scaling could be undertaken.

The TIP framework is proposed as a five-step process, as follows:

1. Invitation to Partner – The City will put forth a problem or challenge and invite potential partners to submit a proposal outlining how they would work with the City, residents, and stakeholders to design, build or use an existing design as a solution.
2. Application Process – The City will put forth an application form, where participants will apply by providing basic information about their solution and their proposed measures for safety and performance monitoring during trial.
3. Trial – The City will define a trial period, during which selected participants will trial their solutions in a controlled test site. Proposed test sites should be representative of the municipal problem or challenge (i.e., if it is active transportation related, then a site with high AT volumes or a City-owned park). Roads that do not fall under the Highway Traffic Act (HTA) would be good to use as sites, as typical roadway restrictions would not apply.
4. Monitoring and Evaluation – The City will evaluate participants' solutions based on performance, impacts and benefits per the issued problem or challenge. Data will also be collected by participants to inform future iteration, as needed. Individual solutions by participants will not be evaluated against each other by the City, and proprietary data will also not be collected by the City.
5. Next Steps – The City can help successful solutions by supporting scaling and commercialization. Beyond the TIP, the solution may be prepared to be implemented in a wider existing process, or to be procured.

Overall, the TIP process timeline will vary depending on the challenge and could be season-specific depending on what the challenge itself is. From a resource perspective, City staff will work on an ongoing basis with program participants and also review applications.

7.4 Further Investigations

7.4.1 Working with York Region Transit to improve local transit service

Transit service is a key component of the City's vision to provide high-quality, attractive, competitive and sustainable mobility choices. For longer distance trips, it is often the most feasible alternative to driving, and to achieve this vision means improving local transit service. The City does not operate transit service but must continue to work with York Region Transit (YRT) to ensure that transit services that run through the City meet the needs of residents, businesses and visitors, today and in the future.

Figure 7-4: Bus-only Lane on Centre Street in Vaughan

Additionally, data sharing with YRT can provide mutual knowledge of where development is occurring and may warrant additional service, and how transit service and ridership is changing across the City.

Recommendations

Actions recommended to work with York Region Transit to improve local transit service include:

- Collaborate with York Region Transit to investigate opportunities for transit service improvements in corridors that are not currently planned for rapid transit services, such as Rutherford Road, Langstaff Road, and Keele Street.
- Collaborate with MTO, Metrolinx and York Region Transit to achieve the frequent local transit goal of 10 minutes or less during peak periods throughout the City, as identified in MTO's Greater Golden Horseshoe transportation planning study.
- Continue to monitor density and development within the City of Vaughan to identify locations where service extensions or frequency increases may be beneficial to better serve City residents.
- Explore innovative transit service models to serve existing and new communities where appropriate.

7.4.2 Aerial mobility

Aerial mobility, or more specifically gondolas and other cable-propelled transit systems are seeing rapid growth over the past decade, in places such as New York City, New York; Portland, Oregon; La Paz, Bolivia; London, England, and; Koblenz, Germany. These systems vary in distance, capacity, cabin size and correspondingly, cost. Primary benefits of these types of systems is that they are adaptable, and when deployed properly, may provide transit benefits such as reduced wait and connection to higher order transit.

As part of the VTP, a conceptual alignment along Jane Street for a gondola system was investigated, with stations at Vaughan Metropolitan Centre, Vaughan Mills Station, Canada's Wonderland, and Cortellucci Vaughan Hospital. A conceptual rendering is shown in **Figure 7-5**.

Figure 7-5: Conceptual Alignment Gondola System Rendering, view from Cortellucci Vaughan Hospital (Image Credit: SCJ Alliance Consulting Services)

This alignment utilized a Tri-Cable (3S) detachable gondola systems, which have three cables: two track cables and one haul cable that provides support and propulsion. This allows the system to use much larger cabins that can carry 35-40 people per cabin and have higher wind stability. 3S gondola system capacity can move up to 5,000 persons per hour per direction, which is comparable to light rail system capacities in urban environments.

Recommendations

Actions recommended to further investigate aerial mobility include:

- Continue to explore opportunities and evaluate the feasibility of implementing aerial mobility systems within the City.
- Partner with stakeholders and other municipalities to consider urban gondola technology and its potential uses and drawbacks as public transit in Vaughan.

A paper on this conceptual alignment is provided as **Appendix O: Aerial Mobility Whitepaper**.

8 Implementation

This chapter provides a summary of the phasing, cost estimates of improvements identified for the preferred alternative, along with monitoring measures and funding sources.

8.1 Infrastructure Improvement Phasing Plan

The alternatives and evaluation method described in Chapter **5** resulted in the Preferred Alternative which is presented in Chapter **5.4**. The Preferred Alternative is composed of the following elements:

- **New Road**, including road extensions or new construction;
- **Road Improvement**, consisting of road widenings or other road capacity improvements;
- **Interchange improvement,** identifying an upgraded interchange planned for Langstaff Road at Highway 400 by York Region;
- **Planned interchange in this area,** identifying an interchange with Highway 400 planned in the area, either at Kirby Road or King-Vaughan Road;
- **Grade Separated Rail Crossing**, which consists of new grade separations for between roads and rail tracks, that were previously at-grade;
- **Rapid Transit Service**, which consists of planned rapid transit corridors consistent with York Region's Transportation Master Plan, and;
- **Two-way, all-day GO Service**, upgrades to train stations and rails to enable all-day, bi-directional service, which is currently under constriction and being delivered as part of Metrolinx's GO Expansion program.
- **Active Transportation Improvements (10-year program)**, improvements identified in the Pedestrian and Bicycle Master Plan for implementation over the next 10 years have been included. As data and analytical tools evolve, additional active transportation improvements should be identified beyond the 10-year horizon.

The following subsections describe the process to identify a phasing plan for the abovementioned improvements.

8.1.1 Phasing Plan Timeframes

Five timeframes were developed in which projects could be categorized. These are as follows:

1. **Immediate**, less than a five-year timeframe;
2. **Short-term**, between five and eight years;
3. **Medium-term**, between nine and twenty years;
4. **Long-term**, greater than a 20-year horizon; and
5. **Deliver with Development**. Recognizing that many of the improvements identified are not reasonable to construct prior to when development occurs, this timeframe identifies projects that are typically in Secondary Plan or Block Plan areas. It should be noted that these projects are not delivered *by* development, rather their delivery timeframe will depend on when development occurs in the area.

8.1.2 Identifying Needs and Priority

To identify needs and priority of proposed infrastructure projects for different horizons, the first step was to filter projects that were already in the project pipeline, i.e. where a timeline for implementation had been identified by annual capital programming or Secondary Plans, so that only projects without assigned timeframes remained.

Then, priority was assigned based on previous analyses from Chapter **2.5**. In these analyses, prioritization scores were assigned to each identified gap in the transportation network based on four categories: Transportation, Land Use, Social Equity and Safety. Furthermore, since proposed improvements would address either an existing gap or a future one, the prioritization scores and the knowledge of whether an existing or future gap would be addressed by the infrastructure project were used in a methodology to allocate projects. This methodology is presented below in Figure 8-1.

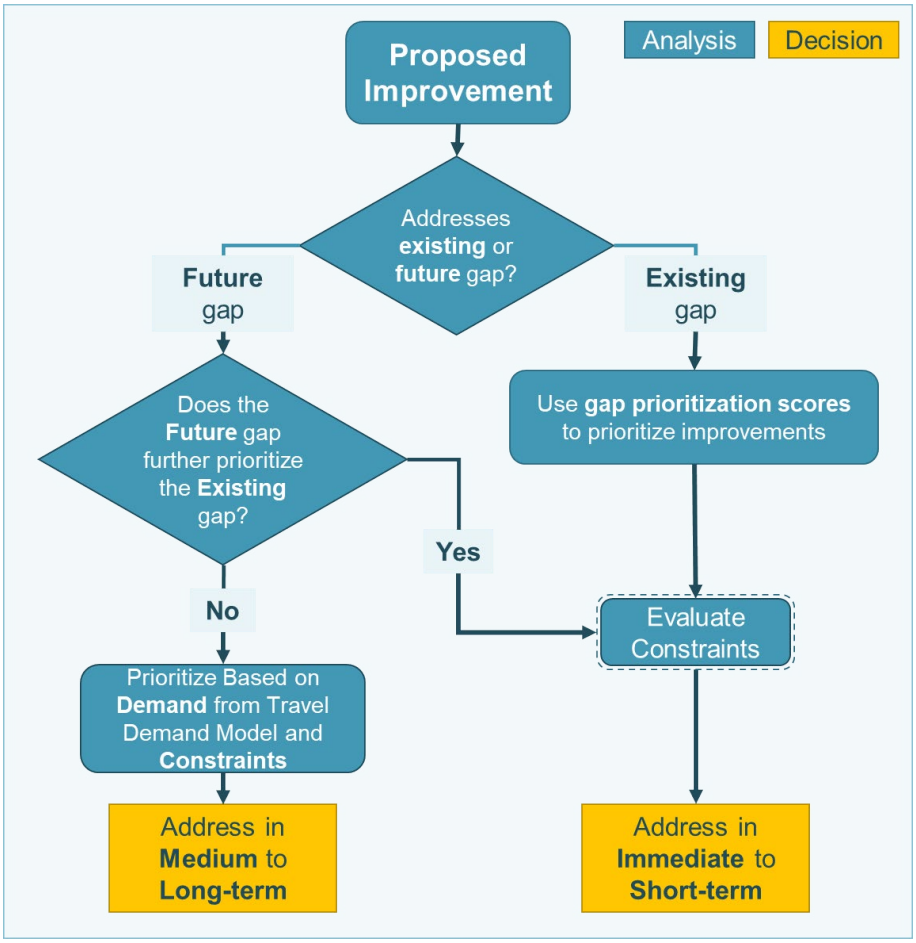


Figure 8-1: Implementation Methodology Flow

To further delineate the improvement timelines (i.e., immediate or short-term, and medium or long-term), three types of constraints were considered, including availability of capital resources, environmental constraints, and availability of delivery resources.

1. **Capital Resource Constraints**, identifying the capital cost required to deliver improvements, and how these would limit the total number of projects that could fit in each timeframe. Where available, costs from the City's 2022 development charges study were used. Capital resources are used as a hard cap based on cumulative costs identified for a cut-off between immediate and short-term, and medium and long-term.
2. **Environmental Constraints**, which identifies the improvement's EA schedule and whether environmental constraints could limit the implementation schedule.
3. **Delivery Resource Constraints**, which identify whether the City resources needed to deliver the improvement (such as staffing) are available within the timeframe.

The methodology was created with the intention of updating the priority list on a regular basis, to ensure that the latest information is reflected, prior to the actual budgeting and programming of projects.

8.1.3 Infrastructure Improvement Timeframes

The following maps illustrate the results of the project implementation priorities, using the methodology discussed in **Chapter 8.1.2**. Each implementation timeframe is represented by a different colour.

Figure 8-2 presents the implementation of the 2051 Preferred Transportation Network.

The timeframes for active transportation improvements are based on the recommendations in the PBMP. The City will, however, also implement improvements to the cycling network through retrofitting or upgrading cycling facilities whenever new road construction and road improvements occur as proposed by the PBMP.

Appendix G: Implementation, Cost Estimates and Proposed EA Schedules provides a full list of projects, their cost estimates, and proposed EA schedules sorted by proposed timeframe for delivery.

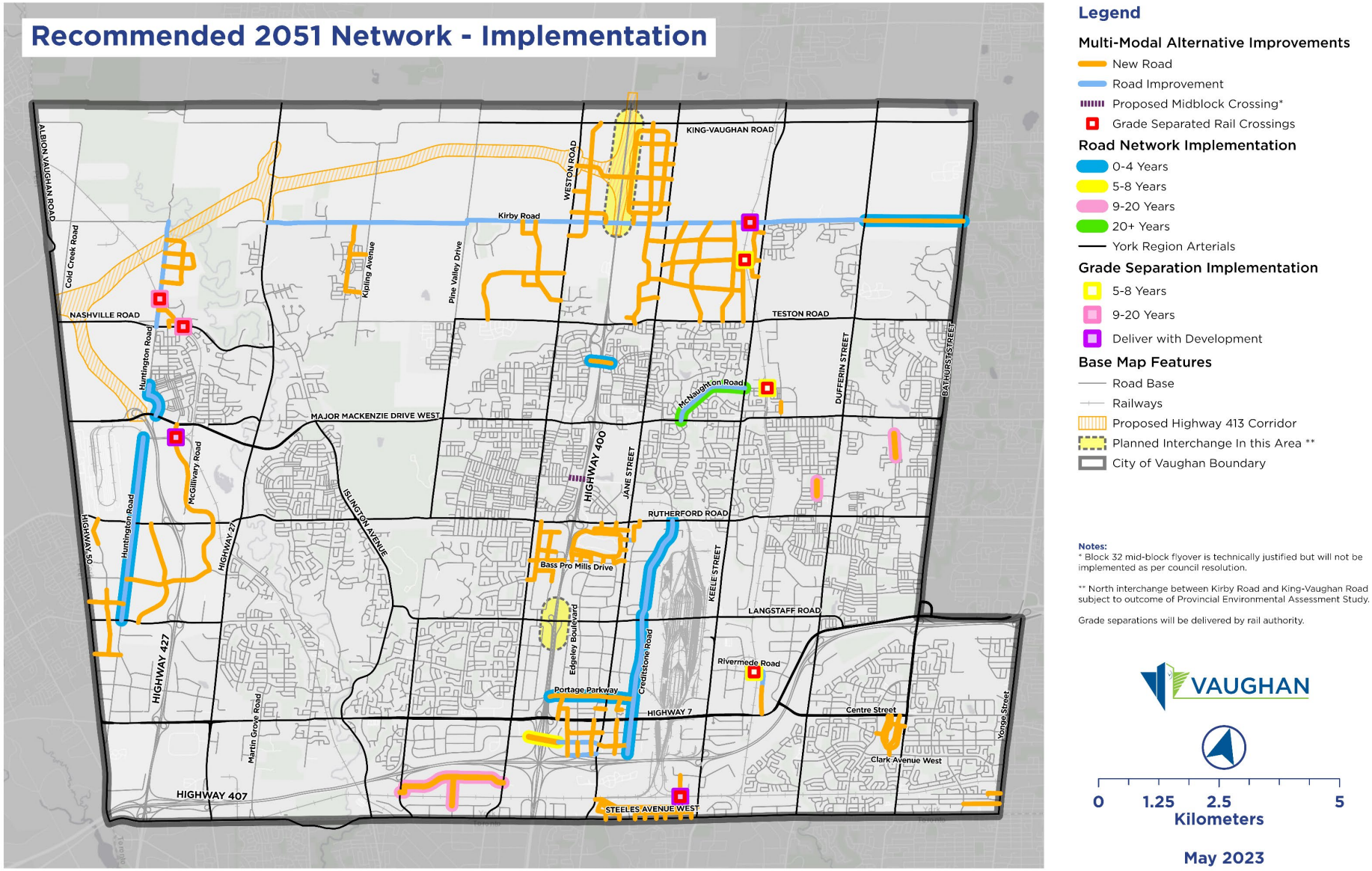


Figure 8-2: 2051 Recommended Transportation Network Implementation

8.2 Funding Strategies

The funding opportunities outlined below should be considered to assist in the implementation of the improvements identified in this document and defray the cost to existing taxpayers.

8.2.1 Development Charges

The City conducts Development Charges (DC) studies to collect and allocate funds for transportation service improvements under the DC Act and should continue to update its studies in the future as well. DC studies identify transportation infrastructure required to serve development growth, including road improvements (i.e., widening, new construction and reconstruction) and active transportation infrastructure. Potential refinements to the DC Study may include provisions for mobility hubs. Additionally, as transit improvements may address development growth in lieu of road improvements, a mechanism for re-allocating DC funds previously allocated to roads should be explored further in partnership with transit service providers (such as YRT), and municipal agencies across Ontario.

Finally, DCs and their role in the overall funding of municipal infrastructure must be reviewed by the City due to the changes made to the DC Act in December 2022.

8.2.2 Canada Community-Building Fund

Formerly known as the Gas Tax Fund, this federal fund was renamed in June 2021 to the Canada Community-Building Fund (CCBF).[24] This permanent funding source is provided upfront, twice annually, to provinces and territories, who in turn flow this funding to local municipalities.

Eligible projects include investments in community public infrastructure in nineteen categories, including public transit, wastewater, highways, airports, rail, sport and culture, among others. Projects are chosen at the local government level and are prioritized according to the infrastructure needs of each community.

In Ontario, the program is administered through a bilateral agreement with the Government of Ontario, the Association of Municipalities of Ontario, and the City of Toronto. The City of Vaughan received approximately $9.7 million from the CCBF in 2021.

8.2.3 Ontario Gasoline Tax

The Province of Ontario offers a similar program to the CCBF, with two cents per litre of the Ontario Gasoline Tax transferred to municipalities to improve and expand public transit. This allocation is based upon each municipality's proportionate share of the province's population and transit ridership. The funds are available for either operating or capital costs.

In January 2022, the Ontario government announced $375 million through the provincial Gas Tax program focused on supporting public transit recovery, which represents a one-time additional funding source of $120.4 million in response to decreased sales of gasoline throughout the COVID-19 pandemic. Since the City does not operate transit services, the funding would go to York Region, however, the City can work directly with YRT to help plan for

[24] Infrastructure Canada. (2018, September 6). Infrastructure Canada—The Canada Community-Building Fund. https://www.infrastructure.gc.ca/plan/gtf-fte-eng.html

the implementation of improved services and identify methods to improve ridership overall in Vaughan. In the 2021-2022 fiscal year, approximately $17 million of this fund was allocated to York Region.

8.2.4 Investing in Canada Infrastructure Program

The Investing in Canada Infrastructure Program provides long-term funding for projects in five specific streams:

- Public Transit Infrastructure;
- Green Infrastructure;
- Community, Culture and Recreation Infrastructure;
- Rural and Northern Infrastructure, and;
- COVID-19 Resilience.

Infrastructure Canada is responsible for reviewing submissions, validating eligibility and funding, and then seeking ministerial approval. Funding from this program then flows when costs are incurred as the project begins. Within Vaughan, most projects that have been funded through this program have been stormwater or drinking water-related, with some energy retrofit projects.

This program is administered through a bilateral agreement with the Province. Applicants should submit their projects to the Province, which the Province, in turn, prioritizes and submits to Infrastructure Canada. The City should look to submit projects to the province for broader approval. The program can be used in the:

- Public transit infrastructure stream to help fund projects improving transit access, such as pedestrian facilities;
- Green infrastructure stream to help fund projects that increase structural or natural capacity to adapt to climate change impacts, in particular for projects identified as having higher potential for having climate change impacts in the VTP implementation plan;
- Community, culture and recreation infrastructure stream to support upgrades to outdoor recreational spaces, and;
- COVID-19 resilience stream, which funding related to active transportation infrastructure, including parks, trails, footbridges, bike lanes and multi-use paths.

Information sharing with City staff in other departments may be beneficial to developing submissions to the Province, as there appears to be success in obtaining funding through this program for water-related projects, which could be leveraged when seeking funding for transportation projects.

8.2.5 Canada Active Transportation Fund

Announced in July 2021, the Federal Government's Active Transportation Fund will provide $400 million over five years to support a modal shift away from cars and toward active transportation. This fund will invest in projects that build new and expanded networks of pathways, bike lanes, trails and pedestrian bridges and support planning and engagement initiatives. The program is administered through two streams: a planning stream for funding planning, design or stakeholder engagement activities and a capital stream for capital projects

that build or enhance active transportation infrastructure, promote active transportation or enhance user safety and security. The application period for this fund was between January and March 2022, and two applications (Humber Trail extension and Jane Street Sidewalk, Cycle Track, and Streetlighting) were put forth by the City.

Receiving funding through this fund would help alleviate municipal funds to put towards other active transportation projects instead. Although this application round has been completed, funding through this program could be available in the future to support active transportation projects.

8.2.6 Additional Programs

Further to the above-described funding programs, other funds, grants, and programs are identified that could provide additional funds to support transportation improvements and programs identified in the VTP. Generally, these programs would cover a smaller subset of VTP improvements or provide lower funding amounts. These are as follows:

- Federation of Canadian Municipalities Green Municipal Fund, which provides grants and low-interest loans under different funding opportunities; Currently, there are funding opportunities for capital, pilot and study projects for Canadian communities by improving transportation systems and networks or encouraging people to switch to less polluting transportation options;
- Transport Canada's Enhanced Road Safety Transfer Payment Program, funding for projects that improve vehicle safety and reduce collision risk;
- Employment and Social Development Canada funding opportunities, including the Enabling Accessibility in Communities Fund;
- Corporate donations which may consist of money or services in-kind, and have been contributed by several large and small corporations over the years;
- Potential future funding that might emerge from the province in rolling out the Ontario Trails Strategy; and
- Private Citizen Donations/bequests, that can also include a tax receipt for the donor where appropriate.

New or existing relationships with non-profit organizations could be leveraged to obtain funding not directly available to the City. This funding could be used to implement certain aspects of the program, such as educational programs, mobility hubs, research and new mobility initiatives. These funding streams include:

- Environment and Climate Change Canada – EcoAction Community Funding Program;
- Ontario Trillium Foundation funding; and
- Corporate Environmental Funds (such as from Shell) tend to fund small, labour-intensive projects where materials or logistical support is required.

8.3 Monitoring Program

Monitoring the VTP is a key step to ensure that the infrastructure and policy recommendations are carried out. A transportation plan monitoring program involves four main steps:

1. Identifying plan goals and objectives (presented in Chapter **4.4**);
2. Defining indicators;
3. Defining the data collection method and timelines, and;
4. Identifying monitoring roles and responsibilities.

The following subsections define the monitoring program for VTP, leveraging best practices from monitoring programs of other municipalities' master planning initiatives.

8.3.1 Key Performance Indicators

A review of best practices indicated three main actions when identifying Key Performance Indicators (KPIs):

1. Providing a few representative KPIs help to summarize performance for each objective, rather than having a large set of KPIs to keep plan monitoring as a repeatable and ongoing process;
2. Identifying the data source for each KPI and ensuring that it is readily available and updated on a recurring basis, and;
3. Identifying the direction of positive change for each KPI, and a baseline against which performance can be evaluated (where available).

Table 8-1 presents these indicators, including the timeframe at which they should be evaluated, the direction of positive change, the baseline and their data source. These are organized by VTP objectives, with a numbering system in the first column.

Table 8-1: Vaughan Transportation Plan Monitoring Program

#	Performance Indicator	Positive Change	Data Source	Timeframe	Baseline
			Accessibility & Connectivity		
1	Auto Average Travel Time to the nearest Primary Centre, Local Centre or VMC	↓	Google Maps Distance Matrix API[25]	Annual	**9.4 Minutes** (2020, averaged across all centres and VMC)
2	Transit Average Travel Time to the nearest Primary Centre, Local Centre or VMC	↓	Google Maps Distance Matrix API	Annual	**31.6 Minutes** (2020, averaged across all centres and VMC)
3	Percent of planned cycling and pedestrian network completed (on a distance basis)	↑	City of Vaughan AT Program Completion	Annual	[completed divided by total planned ped/cycle network length]
			Environmental Stewardship		
4	Sustainable daily mode share (i.e., transit and active mode share) in Vaughan	↑	Transportation Tomorrow Survey[26]	Every five years	**12.9% of trips by sustainable modes** (2016 TTS)
5	Number of publically available Level 2 (L2) or higher Electric Vehicle charging stations	↑	ChargeHub[27]	Annual	**59 L2 or higher charging stations in Vaughan** (2022)
6	Vaughan Greenhouse Gas emissions from Transportation	↓	City of Vaughan GHG Inventory	As available	**335,462 tons** (2014)
			Equity		
7	Transportation spending ratio between road and non-road improvements	↓	City of Vaughan Capital Program	Annual	[total annual road project spending divided by non-road project spending]
8	Ratio of transportation capital spending in equity seeking zones compared to all zones	↑	City of Vaughan Capital Program	Annual	[total capital spending in equity seeking zones divided by capital spend in all zones]

[25] Google. (2022, November 17). Distance Matrix API overview. Google Developers. https://developers.google.com/maps/documentation/distance-matrix/overview
[26] Briggs, R. (n.d.). Data Management Group – TTS Introduction. Retrieved November 23, 2022, from http://dmg.utoronto.ca/transportation-tomorrow-survey/tts-introduction
[27] ChargeHub. (n.d.). Vaughan, Ontario EV Charging Stations Info. Retrieved November 23, 2022, from https://chargehub.com/en/countries/canada/ontario/vaughan.html

#	Performance Indicator	Positive Change	Data Source	Timeframe	Baseline
	Financial Sustainability				
9	Percentage of assets in state of good repair	↑	City of Vaughan Asset Management	Annual	**94% of assets in Very Good or Good condition** (2021)
10	Transit ridership in Vaughan	↑	York Region Transit	Annual	**22.7 million riders** (2019, Overall YRT)
11	Car ownership in Vaughan	↓	Transportation Tomorrow Survey	Every five years	**1.92 vehicles per household** (2016 TTS)
	Reliability & Resilience				
12	Cycling AADT on City-owned separated cycling facilities	↑	City of Vaughan Data Collection Program	Annual	[to establish a baseline based on initial counts]
13	Transit On-time Performance in Vaughan	↑	York Region Transit	Annual	**91.7% On-time performance** (2019, Overall YRT)
14	Auto hours lost to congestion on representative City roads	↓	City of Vaughan Data Collection Program	Every three years	[to define representative City arterials]
	Safety				
15	Annual deaths and injuries from collisions	↓	York Region	Annual	**5 fatalities and 672 injuries** (2018)
16	Annual number of collisions involving pedestrians and cyclists	↓	York Region	Annual	**80 collisions involving cyclists or pedestrians** (2018)

8.3.2 Monitoring Roles and Responsibilities

Monitoring the VTP's progress will require collaboration internally at the City and with other stakeholders. It is important to identify the responsible party for collecting or processing data for each indicator early on.

Since city staff from several departments will be responsible for consolidating multiple data sources (including data from TTS, MTO and York Region) into the KPIs presented in **Table 8-1**, assigning monitoring roles and responsibilities is a key next step to monitoring the progress of improvements identified in VTP.

8.3.3 Monitoring Next Steps

The following next steps are recommended for the VTP monitoring program:

- **Establish data-sharing relationships.** To obtain data needed to update the KPIs in **Table 8-1**, data-sharing relationships will be important, both internally and externally, with York Region.
- **Assign monitoring roles and responsibilities to City staff.** Identifying the responsible staff member for updating these KPIs is important to ensure that these get updated on a recurring basis.
- **Re-baselining KPIs.** KPI baselines in **Table 8-1** were varied in the baseline year, and some are pre-pandemic levels or for overall system (i.e., YRT-related metrics). A re-baselining should be undertaken where complete data is available and could coincide with the next release of TTS data following the ongoing survey.
- **Establishing a platform to provide monitoring updates to stakeholders and the public.** Several alternatives exist to present monitoring results to the public and stakeholders, including progress reports issued on a recurring basis, which could also present how other projects identified in the VTP are progressing as well. Alternatively, a live website could also be feasible. The Greater Philadelphia Area uses a live dashboard called *Tracking Progress*, which provides up-to-date indicator updates and changes relative to the baseline.[28]
- **Evaluating additional opportunities for monitoring transportation network improvements through programs or new technologies.** Working with Smart Commute to implement a Mobility hub pilot program alongside one or more development applications, where information collected on program participation, which can be used as an additional monitoring data. Alternative, implementing smart video technology can provide a source of traffic and multimodal count information, curbside activity monitoring and real-time information on parking traffic and safety through near-miss detection. When implemented, these programs or technologies can produce additional data for monitoring purposes.

[28] https://www.dvrpc.org/TrackingProgress/

8.4 Summary of Recommendations

This chapter provides a summary of all recommendations that form the VTP. These include policy actions recommended through various whitepapers, recommended infrastructure improvements, and recommended actions for monitoring. Each recommendation features a specific ID, a brief description, and where additional information on the improvement is available. Recommendations are prefixed with “VTP”, followed by a dash and a letter depending on what type of recommendation it is:

- **“P”** if the recommendation is policy-based.
- **“IR”** if the recommendation is a road infrastructure improvement.
- **“IAT”** if the recommendation is an active transportation infrastructure improvement.
- **“IGS”** if the recommendation is a grade separated rail crossing.
- **“M”** if the recommendation is for monitoring.

This letter will be followed by a number, by which recommendations can be identified easily. Additionally, a **“YR”** code was added if the improvement is specifically a York Region improvement. This summary of policy recommendations is presented in **Table 8-2**, summary of infrastructure recommendations in **Table 8-3**, and summary of monitoring recommendations in **Table 8-4**.

Table 8-2: Summary of VTP Policy Recommendations

Recommendation ID	Recommendation	Additional Information Source
VTP-P01	Evaluate opportunities to build in climate-resilient actions into the project planning process.	**Chapter 5.5.1**
VTP-P02	Examine opportunities to redesign infrastructure to increase climate resilience.	**Chapter 5.5.1**
VTP-P03	Continue to monitor infrastructure at risk due to climate change**.**	**Chapter 5.5.1**
VTP-P04	Prioritize active transportation infrastructure and shared micro-mobility (e-bike and e-scooter) hubs near major transit station areas and key destinations.	**Chapter 5.5.1**
VTP-P05	Coordinate with development to implement fine-grid street and active transportation networks to increase walkability and connections to transit and other amenities.	**Chapter 5.5.1**
VTP-P06	Apply the Vaughan Transportation Demand Management (TDM) Guidelines to implement improvements within new developments.	**Chapter 5.5.1**
VTP-P07	Investigate dynamic parking pricing in areas with high curbside activities.	**Chapter 7.1**
VTP-P08	Allow parklets on City land in areas with front-facing retail.	**Chapter 7.1**
VTP-P09	Install electric vehicle chargers in residential areas or areas with high curbside activity.	**Chapter 7.1**
VTP-P10	Explore flexible streets and temporary road closures to enable public events and festivals.	**Chapter 7.1**
VTP-P11	Develop safer fleet practices, including goods movement vehicles designed to mitigate risks and impacts to vulnerable roadway users;	**Chapter 7.2**
VTP-P12	Develop a goods movement strategy and truck route network, in collaboration with York Region and other partners, to allocate trucking movements to compatible areas;	**Chapter 7.2**
VTP-P13	Partner with interested businesses to pilot cargo bike operations in urban areas of Vaughan;	**Chapter 7.2**
VTP-P14	Consider safer fleet practices within the City of Vaughan's fleet operations, including vehicles designed to mitigate risks and impacts to vulnerable roadway users;	**Chapter 7.2**
VTP-P15	Formally incorporate freight activities within Complete Street strategies, and;	**Chapter 7.2**
VTP-P16	Develop a formal freight forum to assist with future freight strategies and other plans and developments within the City of Vaughan.	**Chapter 7.2**
VTP-P17	Engage with other municipalities and levels of government on freight and goods movement.	**Chapter 7.2**
VTP-P18	Define where and how micromobility devices can be used in the City (**Complete**).	**Chapter 7.3**
VTP-P19	Develop a "New Mobility Policy" to commit the City in managing and accommodating future mobility to support sustainable transportation and environmental objectives and establishing a Transportation Innovation Program.	**Chapter 7.3**
VTP-P20	Consult with the public and other local stakeholders on their interests and conduct pilots to test technologies and collect data.	**Chapter 7.3**
VTP-P21	Determine where these technologies can operate and how they can be regulated based on the pilots and other best practices.	**Chapter 7.3**
VTP-P22	Leverage micromobility more widely as a first-/last-mile connection through mobility hubs.	**Chapter 7.3**
VTP-P23	Coordinate with IT staff to review existing projects' threat and risk assessments and opportunities for improvement for future projects that involve data collection.	**Chapter 7.3**
VTP-P24	Identify opportunities to incorporate Privacy Impact Assessments for new projects, a risk management process that helps institutions meet legislative requirements.	**Chapter 7.3**
VTP-P25	Continue to collaborate with other municipalities, organizations (e.g., CUTRIC) and industry.	**Chapter 7.3**

Recommendation ID	Recommendation	Additional Information Source
VTP-P26	Propose requirements for EV charging or providing the necessary connections to install EV charging for new developments and in policy language for Secondary Plans.	**Chapter 7.3**
VTP-P27	Support EV charging retrofit programs and opportunities such as EV charging streetlights.	**Chapter 7.3**
VTP-P28	Coordinate with utility companies to ensure that the network is able to support growing EV charging demand.	**Chapter 7.3**
VTP-P29	Support the Goods movement industry's transition to electric fleets.	**Chapter 7.3**
VTP-P30	Lead by example by conducting a study to transition its own municipal fleet to zero-emission vehicles.	**Chapter 7.3**
VTP-P31	Coordinate with other municipalities and agencies to identify and install charging infrastructure to support long-distance travel.	**Chapter 7.3**
VTP-P32	Continue to participate in OVIN, Ontario Smart Mobility Readiness Forum, and other public forums to stay informed on emerging trends in transportation relating to CAV.	**Chapter 7.3**
VTP-P33	Participate and contribute to conversations surrounding implementation standards and roadway design, with transportation staff on technical advisory committees to provide City-specific perspectives for new standards.	**Chapter 7.3**
VTP-P34	Support development of GTHA-wide design, operations and standards for CAV and requisite connected infrastructure to support them, ensuring that the City is well positioned for these newer modes.	**Chapter 7.3**
VTP-P35	Investigate funding sources, such as the Enhance Road Safety Transfer Payment Program by Transport Canada, or the Smart Cities challenge, which could be used to fund studies.	**Chapter 7.3**
VTP-P36	Identify annual budget for new mobility studies and infrastructure spending to address regulatory and infrastructure gaps.	**Chapter 7.3**
VTP-P37	Identify opportunities to bundle new mobility opportunities and infrastructure into wider studies, such as secondary plans, EAs and other residential development.	**Chapter 7.3**
VTP-P38	Ensure that existing staff are monitoring new mobility technologies on the horizon (e.g., CAV, Micro-mobility, Electrification, shared mobility), and including them in the planning process.	**Chapter 7.3**
VTP-P39	Assign new mobility programs (e.g., a micromobility program, CAV program, shared auto program, etc.) to specific staff to manage, and take on additional staff to support or lead these initiatives, as needed.	**Chapter 7.3**
VTP-P40	Investigate taking on staff with additional capabilities beyond the typical transportation engineering skillset (e.g., data science, artificial intelligence, advanced transportation systems).	**Chapter 7.3**
VTP-P41	Implement a standardized platform to manage transportation data that is collected on an ongoing basis.	**Chapter 5.5.2**
VTP-P42	Collect turning movement counts a minimum of once every three years, along with annual average daily traffic (AADT) for auto (tri-annually) and on all separated cycling facilities (annually).	**Chapter 5.5.2**
VTP-P43	Collect collision data from York Region Police on an ongoing basis and establishing clear procedures for cleaning and storing this data in a centralized database or geocoded map.	**Chapter 5.5.2**
VTP-P44	Collect live travel times on arterial roads within City boundaries from York Region's XML feed from Bluetooth travel time sensors.	**Chapter 5.5.2**

Table 8-3: Summary of VTP Infrastructure Recommendations

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IAT-01	Bathurst Street	Teston Road	Major Mackenzie Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-01	Rivermede Road	Langstaff Road	Highway 7	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-02	Dufferin Street	Teston Road	Major Mackenzie Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-02	Avro Road	Jane Street	Major Mackenzie Drive	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-03	Jane Street	Portage Parkway	Teston Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-03	District Avenue	Peter Rupert Avenue	Dufferin Street	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-04	Rutherford Road	Jane Street	Westburne Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-04	Dufferin Street	Rutherford Rd	Major Mackenzie Dr	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-05	Rutherford Road	Peter Rupert Avenue	Bathurst Street	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-05	Dufferin Street	Langstaff Road	North of Highway 407	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-06	Major Mackenzie Drive (Hwy 400 Crossing)	West of Highway 400	Jane Street	Multi-use pathway (south side)	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-06	Dufferin Street	District Ave/Marc Santi Blvd	Apple Blossom Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-07	Weston Road	Major Mackenzie Drive	Hawkview Blvd	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IAT-07	Dufferin Street	Major Mackenzie Drive	District Ave/Marc Santi Blvd	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-08	Bathurst Street	Centre Street	Steeles Avenue	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-08	Dufferin Street	Rutherford Road	Langstaff Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-09	Beverley Glen Boulevard	Dufferin Street	Bathurst Street	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-09	Highway 7	Edgeley Boulevard	Bowes Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-10	Bowes Rd	Rivermede Rd	Highway 7	Sidewalk	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-10	Keele Street	Teston Road	Major Mackenzie Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-11	Dufferin Street	South of Highway 407	Steeles Avenue	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-11	Keele Street	Major Mackenzie Drive	Rutherford Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-12	Highway 7	Centre Street	Bathurst Street	Cycle tracks shared with pedestrians	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-12	Lealind Rd/Freedom Trail/Valley Vista Drive	Petticoat Rd	Bathurst Street	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-13	Highway 7 North Rivermede (100 m MUP)	Bowes Road Centre Street	Centre Street Bartley Smith Greenway	Cycle tracks shared with pedestrians	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-13	Major Mackenzie Drive	Keele St	Silk Oak Ct	Multi-use pathway (south side)	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IAT-14	North Rivermede Rd/Highway 7	Bartley Smith Greenway South	Bowes Rd / Baldwin Ave	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-14	Major Mackenzie Drive	McNaughton Rd	Keele St	Sidewalk and Cycle tracks (MUPs in constrained areas)	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-15	New Westminster Drive	Bathurst Street	Steeles Avenue	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-15	Major Mackenzie Drive	100m East of Keele Street	Bathurst Street	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-16	North Rivermede Rd	Centre St	Bartley Smith Greenway entrance 100m N of Highway 7	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-16	McNaughton Road East	Keele Street	Major Mackenzie Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-17	McNaughton Road West	Major Mackenzie Drive	Keele Street	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-18	Melville Avenue	Roseheath Drive	Rutherford Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-19	Peter Rupert Avenue	Major Mackenzie Drive	Rutherford Road	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-20	Rutherford Road (Bridge over 400)	Weston Road	Jane Street	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-21	Ten Oaks Boulevard/Autumn Hill Boulevard	Confederation Parkway	Bathurst Street	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-22	Thomas Cook Avenue	Major Mackenzie Drive	Randolph Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-23	Thornhill Woods Drive	Rutherford Road	Highway 7	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IAT-24	Vaughan Super Trail On-road Connections (Avro Rd, Netherford Rd, Goodman Cres, Barhill Rd, Planchet Rd, Woodbridge Memorial Arena Parking lot connection to Riverwalk, etc.)	Various	Various	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-25	Via Romano Boulevard	Teston Road	Major Mackenzie Drive	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-26	Davos Road / Ashberry Boulevard	Pine Valley Drive	Vellore Woods Boulevard	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-27	Major Mackenzie Drive	Pine Valley Drive	West of Highway 400	Multi-use pathway (south side)	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-28	Pine Valley Dr	Davos Rd	Via Teodoro	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-29	Rutherford Road	Humber River Trail	Weston Road	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-30	Vellore Avenue	Major Mackenzie Drive	La Rocca Avenue	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-31	Vellore Woods Boulevard	Major Mackenzie Drive	Rutherford Road	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-32	"GO Link" - Block 18 Trail	Rutherford Rd	Major Mackenzie Dr	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-33	America Avenue / Brandon Gate / Melville Avenue / Drummond Drive	Highway 400	Keele Street	Buffered Bicycle Lane	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IAT-34	Barhill Rd	Rutherford Rd	Bartley Smith Greenway entrance 100m N of Rutherford	Multi-use pathway	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IAT-35	Major Mackenzie Drive	Jane Street	McNaughton Rd	Cycle tracks	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-01	Block 27 Street 2	Block 27	Block 27	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-02	Kirby Road	Block 27	Keele Street	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-03	McNaughton Road at Barrie GO Rail	Falvro Street	Troon Avenue	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-04	Rivermede Road at Barrie GO Rail	Bowes Road	Ortona Court	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-05	Snidercroft Road CP Rail Crossing	CP Rail Line	CP Rail Line	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-06	Huntington Road CP Rail Crossing North of Nashville Rd	CP Rail Line	CP Rail Line	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-06	McGillivray Road	CP Rail Line	CP Rail Line	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-07	Nashville Road CP Rail Crossing east of Huntington	CP Rail Line	CP Rail Line	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-YR-01	Rutherford Road CP Rail Crossing west of Highway 27	CP Rail Line	CP Rail Line	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-YR-02	Teston Road	Barrie GO	Barrie GO	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IGS-YR-02	Langstaff Road	Barrie GO	Barrie GO	Grade Separated Rail Crossing	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-01	Canada Dr/America Ave Midblock Connector	Weston Road	Jane Street	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IR-02	Huntington Road	Langstaff Road	Nashville Road	4-lane new road and widening (discontinous at Highway 427, Part A and Part B of EA)	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-03	Huntington Road - 427 Ramp Extension	Major Mackenzie Drive	Huntington Road	4-lane off-ramp extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-04	Kirby Road	Dufferin Street	Bathurst Street	4-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-05	Creditstone Road	Peelar Road	Rutherford Road	Improvement / 4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-06	Portage Parkway	Jane Street	Creditstone Road	4-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-07	Colossus Drive (Highway 400 Midblock Crossing)	Commerce Street	Famous Avenue	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-08	Aviva Park Drive Extension / Connection to Galcat Drive	Weston Road	Pine Valley Drive	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-09	Scholes Road	Steeles Avenue	Aviva Park Drive	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-10	Grand Trunk Avenue	Princess Isabella Court	District Ave	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-11	Thomas Cook Avenue	Randolph Drive	Valley Vista Drive	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-12	McNaughton Road Improvements (West of Keele Street)	Major Mackenzie Drive	Keele Street	Road Improvement	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-13	John Lawrie Street	Huntington Road	Highway 27	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-13	Bass Pro Mills	Highway 400	Weston Road	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IR-14	Caldari Road	Riverock Gate	Rutherford Road	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-15	Kirby GO Station Road Network / Vista Gate Extension	Keele Street	GO Station	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-16	Maplecrete Road	Portage Parkway	Barnes Court	2-lane extension / new road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-17	Ortona Court	Rivermede Rd	340M South Rivermede	2-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-18	Riverock Gate	Jane Street	Caldari Road	2-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-19	Barnes Court	Maplecrete Road	Creditstone Road	2-lane extension / improvements	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-20	Block 27 Collector Road Network	Block 27	Block 27	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-21	Block 34 Collector Road Network	Block 34	Block 34	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-22	Block 35 Collector Road Network	Block 35	Block 35	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-23	Block 41 Collector Road Network	Block 41	Block 41	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-24	Block 59 North/South Collector Road Network	Block 59	Block 59	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-25	Block 60 Collector Road Network (McGillivray Road)	Block 60	Block 60	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-26	Block 60 East Collector Road Network (Residential)	Block 60 East	Block 60 East	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IR-27	Commerce Street	Applemill Road	Exchange Avenue	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-28	Doughton Road	Commerce Street	Creditstone Road	2-lane extension / improvements	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-29	Edgeley Boulevard	Portage Parkway	Exchange Avenue	Extension / Improvement	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-30	Huntington Road	Nashville Road	Kirby Road	Road improvements	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-31	Interchange Way	Highway 400	Creditstone Road	New road / 4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-32	Kirby Road	Jane Street	Dufferin Street	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-33	Kirby Road	Weston Road	Jane Street	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-34	Kirby Road	Highway 27	Weston Road	Reconstruction	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-35	Kleinburg-Nashville Focus Area Collector Network	Block 62/55	Block 62/55	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-36	Maplecrete Road	Highway 7	Peelar Road	2-lane extension / widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-37	Millway Avenue (South)	Highway 7	Peelar Road	4-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-38	Ortona Court	490M South Rivermede	Highway 7	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-39	Ortona Court	340M South Rivermede	490M South Rivermede	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-40	Peelar Road / Exchange Avenue	Commerce Street	Creditstone Road	2-lane extension / improvements	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IR-41	Pinewood Drive Extension	Powell Road	Yonge Street	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-42	Primary East West Collector (Steeles Avenue West Secondary Plan)	Jane Street	Keele Street	4-lane new road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-43	Promenade Secondary Plan - Collector Road Network	Promenade Circle	Promenade Circle	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-44	Royal Palm Drive Extension	Hilda Avenue	Yonge Street	New road	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-45	Vellore Woods Boulevard / Creditview Road Extension	Rutherford Road	Langstaff Road	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-46	Hill Street/Troon Ave (Block 19)	Major Mackenzie Road	Teston Road	2-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-47	Vaughan Mills Secondary Plan – Collector Road Network	Vaughan Mills SP Area	Vaughan Mills SP Area	New road network	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-01	Highway 7	Kipling Avenue	Helen Street	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-02	Rutherford Road	Jane Street	Bathurst Street	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-03	Major Mackenzie Drive	Highway 400	Jane Street	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-04	Teston Road	Pine Valley Drive	Weston Road	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-05	Highway 27	Major Mackenzie Drive	North City limits	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Improvement ID	Improvement	From	To	Improvement	Additional Information Source
VTP-IR-YR-06	Bathurst Street	Autumn Hill Boulevard	Kirby Road	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-07	Dufferin Street	Major Mackenzie Drive	Teston Road	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-08	Highway 50	Rutherford Road	GTA West	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-09	Highway 50	Steeles Avenue	Highway 7	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-10	Jane Street	Teston Road	King-Vaughan Road	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-11	Keele Street	Steeles Avenue	Highway 407	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-12	Keele Street	Highway 7	Rutherford Road	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-13	Teston Road	Keele Street	Dufferin Street	4-lane extension	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-14	Langstaff Road	Weston Road	Dufferin Street	6-lane extension & widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-15	Dufferin Street	Langstaff Road	Rutherford Road	6-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-16	Pine Valley Drive	Rutherford Road	Teston Road	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-17	Teston Road	Dufferin Street	Bathurst Street	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-18	Weston Road	Teston Road	King-Vaughan Road	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules
VTP-IR-YR-19	King-Vaughan Road	Weston Road	Bathurst Street	4-lane widening	Appendix O: Implementation, Cost Estimates and Proposed EA Schedules

Table 8-4: Summary of VTP Monitoring Recommendations

Recommendation ID	Recommendation	Additional Information Source
VTP-M01	Establish data sharing relationships to obtain data needed to monitor and update Key Performance Indicators.	**Chapter 8.3**
VTP-M02	Assign monitoring roles and responsibilities to City staff.	**Chapter 8.3**
VTP-M03	Re-baseline Key Performance Indicators when complete data is available.	**Chapter 8.3**
VTP-M04	Establish a platform to share monitoring results to the public and stakeholders.	**Chapter 8.3**
VTP-M05	Evaluate additional opportunities for monitoring transportation network improvements through new programs or technologies.	**Chapter 8.3**

8.5 Recommendations for TMP Updates

TMPs are typically reviewed every five years. However, as discussed in **Chapter 8.38.3.3**, providing recurring status updates to the public and stakeholders can keep them informed on how infrastructure improvements are advancing and construction progress. Annual progress reports and/or updates to infrastructure prioritization should be considered, as the VTP is a "living document" and should be updated with new, relevant information as it becomes available.

8.6 Recommendations for Future Plans and Studies

The VTP provides a summary of recommended infrastructure. In alignment with the VTP's vision to provide high-quality, attractive, competitive and sustainable mobility choices to every resident, business and visitor in Vaughan, future plans and studies are proposed for different modes.

The City's transformation of its active transportation network has already begun, with the City's Pedestrian and Bicycle Master Plan (PBMP) providing direction for active transportation for the next ten years. As the active transportation and trail networks are built out, an update for this plan is recommended to identify lessons learned and define next priorities to further enhance active transportation as a convenient and healthy transportation option in Vaughan.

For transit projects, the City will continue to work with York Region Transit to investigate potential service improvements and identify development areas where improvements could be beneficial. New transit service models, such as on-demand microtransit, are presenting new opportunities to serve existing and new communities as a feeder service to higher-order transit, which the City and York Region Transit can collaborate to pilot, and explore longer-term implementation, where warranted.

Additional details for road projects recommended specifically through the plan that are not covered in other planning documents or studies are provided in Appendix P: Satisfying EA Requirements.

These are presented in the form of project sheets, that will include:

- A project description, include extents, length, type, justification, and alternatives considered;
- Proposed project phasing;
- Proposed Environmental Assessment (EA) schedule, including review of potential socio-economic and environmental impacts, and;
- Project cost estimate.

These sheets provide a project-level summary of analyses and requisite information to proceed with Phase 3 and Phase 4 EA study.

9 Acknowledgements

The project team would like to acknowledge the contributions of individuals and groups who helped to develop the directions, policies and infrastructure that form the Vaughan Transportation Plan:

CITY OF VAUGHAN

Citizens of Vaughan

Mayor and Members of Vaughan Council

Transportation Planning and Engineering: Christopher Tam, Alicia Jakaitis, Selma Hubjer, Petr Emelianov, Hilda Esedebe, Dorothy Kowpak, Winnie Lai, Mani Shahrokni, Marta Roias

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Appendix A: Review of the 2012 TMP

Appendix B: Transportation Needs Assessment and Alternative Development

Appendix C: Vaughan Travel Demand Model Calibration and Validation

Appendix D: Long List of Existing Gaps from Needs Assessment

Appendix E: Public and Stakeholder Consultation

Appendix F: Proposed Improvements in Transportation Alternatives

Appendix G: Implementation, Cost Estimates and Proposed EA Schedules

Appendix H: Climate Change and Resiliency Whitepaper

Appendix I: Data Collection Whitepaper

Appendix J: Preliminary Policy Research for Private Roads

Appendix K: Street Classification Whitepaper

Appendix L: Maximizing Value for Transportation Infrastructure Whitepaper

Appendix M: Goods Movement Whitepaper

Appendix N: Future Mobility Whitepaper

Appendix O: Aerial Mobility Whitepaper

Appendix P: Satisfying EA Requirements