ride & stride
MARKHAM
ACTIVE TRANSPORTATION
• MASTERPLAN •

2021

RIDE & STRIDE: MARKHAM ACTIVE TRANSPORTATION MASTER PLAN

Executive Summary

KEY DEFINITIONS & ABBREVIATIONS

- **AAA:** All Ages & Abilities
- **AODA:** Accessibility for Ontarians with Disabilities Act, 2005
- **AT:** Active Transportation
- **ATMP:** Active Transportation Master Plan
- **CPAC:** Cycling and Pedestrian Advisory Committee
- **CPSAP:** Cycling and Pedestrian Safety and Awareness Program
- **PIC:** Public Information Centre
- **LPI:** Leading Pedestrian Interval
- **RTOR:** Right Turn on Red
- **STP:** School Travel Planning
- **TAC:** Technical Advisory Committee
- **TDM:** Transportation Demand Management
- **TTS:** Transportation Tomorrow Survey
- **YRT:** York Region Transit

Active Transportation: any mode of travel that relies primarily on human power to move people, with a specific focus on walking (including the use of mobility device) and cycling

All Ages & Abilities: Best practices approach to cycling facility and network design to ensure the development of safe, accessible and equitable transportation systems for users of all ages and abilities

Bicycle Boulevards / Quiet Street Routes: Bikeways on streets with low speeds and low volumes that are specifically designed to enhance cyclist safety and comfort through traffic calming and/or wayfinding

End-of-Trip Facilities: Facilities and/or spaces designed for active transportation users that provide safe and secure places to rest and/or store equipment (e.g. bike racks, bike lockers, changerooms)

First-Last Kilometre Solutions: Design approaches to help improve connectivity from someone's home to a transit station/stops

Micromobility: Small, lower-speed, personal transportation devices, either powered or self-propelled, typically intended for shorter trips; Includes e-bikes, e-scooter as examples

Mode Share: The share of all trips taken by a particular mode (method of travel), usually shown as a percentage

Open Streets: An event where a pre-selected street or network of streets is closed to vehicles and reserved for walking, cycling and community activities

Pedestrian Priority Area: Areas identified for targeted investment in pedestrian improvements beyond improvements identified at the City-wide level based on a variety of factors: pedestrian collisions, walking mode share, access to major transit, existing sidewalk gaps and income

Pedestrian Crossover: A specific type of traffic control deivce which provides pedestrians with the right-of-way over vehicles

Priority Cycling & Trails Network: A network of primarily quiet street routes, multi-use paths and protected bike lanes that is intended to be delivered largely within a short-term horizon to provide connectivity across the City

Road Diet: A re-organization of the existing road space without significant civil works, which reduces the overall cost and schedule needed to implement cycling facilities (e.g. narrowing lanes or reducing the number of travel lanes)

Tactical Urbanism: Tactical urbanism includes low-cost,temporary changes to the built environment, usually in cities, intended to improve local neighbourhoods and city gathering places, traditionally initiated by community members

Traffic Calming: Strategies and tools used to manage traffic volumes and speeds (e.g. raised medians, speed humps, chicanes etc.)

Transportation Demand Management: Strategies and policies used to reduce congestion and increase the use of sustainable modes of transportation

OVERVIEW

An active transportation master plan (ATMP) is a long-term plan to guide the development of active transportation networks, policies and programs as part of the broader multi-modal transportation system.

Markham's ATMP includes recommendations under the following key themes to encourage people of all ages and abilities to walk and cycle as transportation options:

Pursue Pedestrian Network Improvements

Connect & Enhance the Cycling Network

Encourage & Engage our Community

Evolve Design & Maintenance for Active Transportation Facilities

INVESTING IN ACTIVE TRANSPORTATION

Investment in active transportation has numerous community benefits – it helps to create healthier, happier populations, it improves the environmental outcomes and efficiency of our transportation system, and it has economic benefits such as contributing to local business areas.

During the development of this plan, major events have reinforced the need for a safe, comfortable and well-connected active transportation network in Markham. The COVID-19 pandemic, which hit across Canada and the globe as this report was being prepared, has disrupted traditional travel patterns and behaviours. It has accelerated the use of walking and cycling as viable ways to travel. At the same time, the City has been investigating the safety outcomes of the City street network through a road safety audit and is planning to develop a comprehensive road safety plan.

In addition to the pandemic and safety challenges, the issues of climate change and long-term traffic congestion in Markham emphasize the importance of active transportation. The City's "Getting to Zero: Markham's Municipal Energy Plan" assumes that as part of future scenarios 50% of trips with a length between 1 and 5 km shift to cycling by 2040, and 50% of the potential walking trips that were less than 2 km and were not supporting the travel of another passenger were shifted to walking by 2050. Both goals require a major increase in active transportation infrastructure and programs.

Action is needed now more than ever to provide the infrastructure, programs and policies that are required to ensure safe mobility options are available for all residents, and grow the walking and cycling culture in Markham.

The Markham Active Transportation Master Plan outlines the policies, directions, steps and projects that need to be undertaken to achieve the goals of the City of Markham and respond to the pressing issues of safety and mobility facing our community.

OUR VISION

Vision Statement

A vision statement was developed for the ATMP using input from staff, stakeholders, and the public. Key words and phrases identified throughout the consultation were used to build and refine the vision into an aspirational, yet achievable, statement about the future of active transportation in Markham:

"People walking and cycling in the City of Markham feel safe, encouraged and have a sense of community. Networks are comfortable, accessible, safe, convenient and connected, and provide access to key destinations and transit. Through an on-going culture shift and investment, active transportation is a healthy and effective mode of transportation and a competitive alternative to driving for short trips."

Objectives

The following five objectives guided the development of the Active Transportation Master Plan for Markham:

1. Create education and outreach opportunities in order to raise awareness of active transportation in the City of Markham by engaging and consulting with stakeholders and members of the community in an open and transparent process during the development of the ATMP.
2. Identify facility improvements and design a high quality on-road and off-road active transportation network that is accessible and connects people to where they work, play and live.
3. Develop an active transportation strategy that looks beyond the network/infrastructure needs and provides guidance on gaining public and political support, shifting behaviour to foster complete communities and strengthening active transportation culture in the City of Markham.
4. Provide high quality connections between the local and regional active transportation network and ensure strong collaboration between City of Markham and York Region in the delivery and implementation of active transportation strategies.
5. Develop a feasible phasing plan for the implementation of a City-wide active transportation network and execution of strategies, programs and activities with careful consideration of resources and financial requirements.

Public Consultation

Public consultation was a major component of developing the ATMP and the proposed networks. It was critical for the study team to understand the community's needs and desires to develop an accessible, safe, and connected network for people of all ages and abilities.

Throughout the study, the project team held numerous consultation events and activities to gain feedback from residents and key stakeholders. Participants were encouraged to provide input on the issues, needs and strategies that could improve active transportation in Markham. The study included three rounds of consultation, with a combination of open houses and pop-up events, presentations, online consultations, etc. The study team also engaged regularly with a technical advisory group of key stakeholders.

Common responses received throughout the three rounds of engagement included:

- **Support programming activities and initiatives (e.g. Markham Cycles Hub, educational safety campaigns, etc.);**
- **Provide more connections to GO stations;**
- **Help cyclists cross major barriers in the existing network;**
- **Focus on safety, especially year-round maintenance;**
- **Identify a network of AAA (All Ages and Abilities) cycling facilities to support children and families;**
- **Address sidewalk gaps near schools and senior's communities; and**
- **Establish a clear and connected network of multi-use paths across Markham.**

UNDERSTANDING THE CONTEXT

Study Foundations

Prior to the development of the ATMP, the City of Markham's Cycling Master Plan (2010) and the City of Markham's Pathways & Trails Master Plan (2009) were used to guide investment in active transportation. The ATMP updates the networks and strategies that have been identified and implemented from these plans to ensure the development and implementation of a coordinated and connected active transportation network.

Policy Support

Policy documents at the provincial, regional, and local level demonstrate support for active transportation. The ATMP is intended to reflect the policies of these documents related to safety, sustainability and health, as it strives to achieve Markham's vision for active transportation. Exhibit E-1 lists key policy and plan documents from all levels of government that emphasize support for active transportation.

Building Markham's Future Together

The City of Markham developed a Strategic Plan, Building Markham's Future Together to guide decisions for Markham's future. One of the strategic actions identified in BMFT was Action 3.1.5 to implement an active transportation master plan and first and last mile solutions (biking, walking, transit). The ATMP will also support key objectives of the Strategic Plan based on:

- **Economic benefits such as lowering the cost of transportation for individuals, reducing traffic congestion, contributing to vibrant local business areas, and reducing externalized societal costs;**
- **Health benefits such as decreasing the risk of obesity, providing opportunities to embed physical activity into daily routines, and improving mental health;**
- **Community benefits such as providing more equitable transportation options for residents, increasing social interaction, and improving quality of life; and**
- **Environmental benefits such as reducing greenhouse gas emissions, providing more efficient forms of transportation, reducing air pollution, and reducing energy consumption.**

PROVINCIAL	• Provincial Policy Statement (2020) • **Places to Grow**: Growth Plan for the Greater Golden Horseshoe (2017) • #CycleON – Ontario's Cycling Strategy (2013), Action Plan 1.0 (2014), & Action Plan 2.0 (2018) • Metrolinx 2041 Regional Transportation Plan (2016) • Metrolinx GO Rail Station Access Plan (2016)
YORK REGION	• **York Region Vision 2051**: strong, caring, safe communities • York Region Official Plan (2016) • York Region Transportation Master Plan (2016)
CITY OF MARKHAM	• City of Markham Official Plan (2014) • **Building Markham's Future Together**: Strategic Plan (2020-2023) • Greenprint Community Sustainability Plan (2011) • Markham Municipal Energy Plan (2017) • Integrated Leisure Master Plan (2019)

Exhibit E-1: Provincial, Regional and Local Policies and Plans Supportive of Active Transportation

How Markham Moves

The ATMP analyzes travel trends for active transportation in Markham and York Region, drawing on data from the Transportation Tomorrow Survey. Key findings of the review include:

- Cycling mode share is small, but growing (from 0.1% in 2001 to 0.7% in 2016);
- Walking mode share is growing (from 3.6% in 2001 to 5.5% in 2016);
- Many short trips have the potential to be converted to active transportation – currently, two thirds of trips under 2 km are taken by car; vehicle ownership per household is decreasing, and there are fewer vehicles per household than throughout York Region; and
- The share of young adults without a driver's licence is growing as young adults are increasingly opting for other mobility options such as ride sharing, walking, cycling, and transit.

Exhibit E-2: Mode Share Trends for All Trips from and within Markham and York Region

KEY CONSIDERATIONS AND EMERGING TRENDS

The following factors have emerged in municipalities across Canada in recent years and are taking on increasing importance in active transportation planning. They are key considerations in the development of the plan.

Equity

Historically, transportation planning has resulted in decisions that disproportionally disadvantage members of our communities based on physical or cognitive ability, age, race, income, gender, spoken language, etc. It is important that transportation planning recognizes the needs of vulnerable populations and uses strategies to overcome barriers to transportation equity. Equity has been incorporated into the ATMP by:

- Providing consultation activities in a variety of formats and venues;
- Explicitly considering factors such as income, access to community destinations and senior/youth populations in network development;
- Focusing on creating a network of All Ages & Abilities (AAA) facilities that serves a variety of residents; and
- Tying key recommendations to needs of specific vulnerable populations (e.g. new immigrants, minority populations, and children and youth).

All Ages & Abilities

A network of All Ages & Abilities (AAA) cycling facilities aims to target the 'interested but concerned' portion of the population – people that are interested and open to cycling but require the provision of an equitable network of safe and comfortable facilities to support them. A network of AAA cycling facilities would increase comfort and safety for more vulnerable users such as children, seniors, people of colour, people with disabilities, etc. This is addressed in the ATMP by:

- Identifying a core network of AAA cycling facilities as part of the short-term priority cycling network, primarily comprised of quiet streets, multi-use paths and protected bike lanes/cycle tracks.

Micromobility

Micromobility refers to small, lower-speed, personal transportation devices, either powered or self-propelled, typically intended for shorter trips (e.g. bicycles, e-bikes and kick e-scooters). Micromobility options are increasingly viewed as important components of the overall transportation system, particularly for first-last kilometre connections to major transit stations. Micromobility is considered in the ATMP by:

- Encouraging improvements to the walking and cycling networks, indirectly supporting the implementation of micromobility options within the City; and
- Exploring micromobility as a mode of transportation for the first kilometre/last kilometre access to rapid transit stations.

KEY THEMES

Recommendations in the ATMP have been divided into four key themes based on the vision and stakeholder input, and ensure the ATMP addresses the safety and comfort of pedestrians and cyclists.

Pursue Pedestrian Network Improvements

Connect & Enhance the Cycling Network

Encourage & Engage Our Community

Evolve Design & Maintenance

A high-level overview of each theme is provided in the following sections; detailed recommendations are listed in Exhibit 3. Recommendations within the ATMP can be generally categorized into the following types of recommendations:

- continuing with existing programs;
- expanding existing programs; and
- new programs.

Important new programs of the ATMP are highlighted in each section.

Theme 1

PURSUING PEDESTRIAN NETWORK IMPROVEMENTS

Walking is a major component of active transportation in Markham. Active transportation infrastructure should support pedestrians by creating accessible, safe, and comfortable environments for walking. It is important that the ATMP addresses barriers in the existing network for pedestrians to ensure walking is a viable option for residents. The recommendations in this section focus on enhancing pedestrian safety, providing better connections for those travelling on foot, and promoting walking as an attractive transportation option in Markham. The recommendations are grouped into the following four action areas:

Traffic calming is also important for pedestrians - see Theme 4 for more information.

- **Address city-wide sidewalk gaps;**
- **Enhance Pedestrian Priority Areas;**
- **Facilitate safe crossings;**
- **Improve accessibility & safety at intersections; and**
- **Connect school sites.**

NEW PROGRAMS

Pedestrian Priority Areas: In addition to addressing sidewalk gaps throughout the City, the ATMP recommends targeting investment in key neighborhoods to help improve connectivity. These high-priority areas were identified based on a variety of factors such as pedestrian-vehicle collisions, proximity to GO stations, income distribution and the concentration of sidewalk gaps. A map of the pedestrian priority areas is appended to the Executive Summary, and area-specific maps describing proposed interventions are appended to the ATMP report.

Pedestrian Safety Countermeasures at Signalized Intersections: The ATMP recommends developing a warranting and review program through the City's Road Safety Plan to implement countermeasures such as leading pedestrian intervals (LPI), Right-Turn-on-Red (RTOR) restrictions; and increased walking time for pedestrian phases. It is recommended that the City prioritize signalized intersections with heavy pedestrian volumes, a history of pedestrian collisions, or anticipated use by vulnerable populations such as children, seniors, low income residents, new immigrants and/or aboriginal residents.

Year-round Maintenance of Pathways near Schools: The ATMP recommends working with School Travel Planning partners to identify candidate pathways for winter maintenance as a pilot at 5-10 school sites. Pedestrian pathways connecting to school sites not maintained year-round are significant barriers for students walking to and from school. Key links can be identified through the School Travel Planning process, then funding implications can be identified.

Theme 2

CONNECTING & ENHANCING THE CYCLING NETWORK

Cycling is a growing mode of active transportation in Markham. The City's Cycling Master Plan (2010) and Pathways and Trails Master Plan (2009) have led to significant improvements to the cycling infrastructure and facilities in Markham. It is important to continue to pursue further network improvements and expansions to make cycling a safer option for people of all ages and abilities in Markham.

This theme focuses on areas of concern in the cycling network and uses core recommendations to address them through network and facility improvements. Supporting maps are appended to the executive summary. The recommendations under this theme are divided into the following key strategies:

- **Upgrade the Existing Network;**
- **Create a Short-Term Priority Network;**
- **Pursue a Long-Term Network Vision; and**
- **Support the Network.**

Existing cycling network length: ~116km*

Proposed ultimate cycling network length: ~305km*

*Excludes shared roadways and upgrades to existing facilities

NEW PROGRAMS

Intersection Upgrades to Existing Cycling Facilities: Many existing cycling facilities have gaps at intersections where the bikeway has been dropped in order to add vehicular turn lanes. Intersections are where cyclists are most vulnerable to conflicts with vehicular traffic. The City's on-going Road Safety Audit and upcoming Road Safety Plan can be used to identify these gaps and appropriate upgrades, such as lane narrowing, turn lane removal, or localized road widening to improve the accommodation of cyclists at intersections.

Linear Upgrades to Existing Cycling Facilities: In order to ensure a consistent, high-quality network, a number of upgrades need to be made to Markham's existing cycling facilities, including recreational trails, multi-use paths, and on- and off-road cycling facilities. Improvements including wayfinding and signage, introducing traffic control measures, and upgrading cycling facilities to better reflect the roadway context. These upgrades generally consist primarily of low-cost solutions that will significantly improve the network.

Automatic Cycling Counters: Bundling the delivery of automatic cycling counters with major capital projects that include cycling infrastructure provides an efficient way to improve the data collection capabilities of the City. It will help with the understanding of the usage of individual cycling routes, and the return on investment in the cycling network. Higher profile routes could include an informational totem that displays the number of cyclists that day or year-to-date, building public awareness of cycling use.

Theme 3

ENCOURAGING & ENGAGING OUR COMMUNITY

An important aspect of promoting a shift towards active transportation, in concert with developing an active transportation network, is growing a supportive walking and cycling culture in Markham. Recommendations are provided under the following key strategies:

- **Support Active School Travel;**
- **Build a Sense of Community; and**
- **Inform, Educate, Engage, Encourage.**

The recommendations consist of continuation and expansion of existing programs and partnerships such as Ontario Active School Travel, Markham Cycles Hub, Smart Commute Markham Richmond Hill, the City's Transportation Demand Management initiatives, Bike to Work Week, Jane's Walk, Markham Cycling Day, trail & cycling map updates, Bike n' Ride service, York Regional Police online bike registry program, wayfinding for pedestrians and cyclists, and the City's event bicycle parking program.

EXPANDING PROGRAM

Markham Cycles Hub: Markham Cycles is the first community cycling hub in York Region. Initiated in 2019, it offers services, programs, and workshops aimed at establishing a stronger cycling culture in Markham. Markham Cycles has taken over some of the program previously delivered by the City such as cycling and cycling maintenance classes, so they serve a key role in supporting cycling programming across the City.

Some of these services include:

- Bike Rescue Program
- Group Rides
- Bike Host
- Bicycle Library
- Learn to Ride Class

NEW PROGRAM

Communications Strategy for Complete Streets & Road Diets: The ATMP includes a significant emphasis on implementing lane reconfigurations and road diets to provide improved pedestrian and cycling facilities within a short time-frame. Educational and engagement materials can be developed to illustrate community benefits of complete streets and road diets, such as reducing speeding within residential neighbourhoods, improving ease of midblock crossings, providing additional space for greenery in planters, and improving space and amenities for pedestrians and cyclists.

EXPANDING PROGRAM

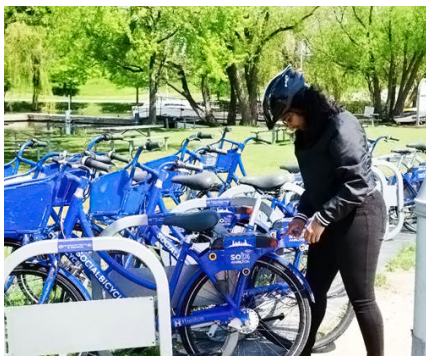
Open Streets Program: Markham Cycling Day is an annual day-long event which offers a safe, fun, and educational environment for residents of all ages and abilities to get out and be active on a bicycle. It includes a variety of events for children and adults of all skill-levels and provides an opportunity for the community to come together to support Markham's growing cycling community. As York Region's largest cycling event, there is potential to continue the momentum of Markham Cycling Day and consider a weekly or seasonal Open Streets Program.

EXPANDING PROGRAM

Cycling and Pedestrian Safety and Awareness Program (CPSAP): This program would provide a variety of resources including communication strategies, comprehensive program and webinars, workshops, training etc. related to safe walking and cycling, driver education related to vulnerable road user safety and new infrastructure interventions (for example, pedestrian crossovers). The program can also address interactions between pathway users and path etiquette, including proper behaviours for those on new mobility forms such as e-scooters and e-bikes.

- Build upon work of Smart Commute & Markham Cycles
- Expand beyond communication campaign: Comprehensive program webinars, workshops, training etc. including Bruce Mills Safety Village

NEW PROGRAM



Shared Micromobility Program: Building upon the findings of York Region's Evaluation of Bike Share Program Potential report, the City should investigate the feasibility of a publicly, non-profit or privately owned / operated bike, e-assist bike and/or scooter share system within high-potential areas identified such as Unionville, Mount Joy, and Milliken. A successful micromobility share system can promote efficient ways to travel, especially for shorter trips, and can provide connections to transit for first-last kilometre. City ownership, or a publicly subsidized non-profit operations would allow greater control over operations, the placement of stations, and quality of service. From a user's perspective, micromobility enables one-way trips and increased multi-modal flexibility, removes concern over theft or damage to a personal bicycle or e-scooter, and eliminates the need for secure storage at home, among other conveniences.

Theme 4

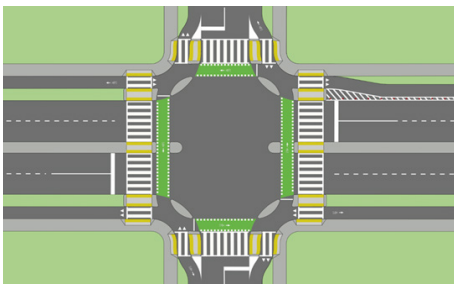
EVOLVING DESIGN & MAINTENANCE

Best practices in active transportation infrastructure design are continuously evolving. Higher-order facilities including cycle tracks and multi-use paths are becoming more commonplace as the focus in cycling facility selection and design shifts towards emphasizing safe mobility for people of all ages and abilities. Maintenance and operations activities are also a key priority identified amongst pedestrians and cyclists we consulted during the plan. Recommendations under this theme are structured around the following key strategies:

- **Evolve Facility Selection & Design Practices;**
- **Support Walking & Cycling through Urban Design, Traffic Calming and Improved Road Design Practices;**
- **Evaluate a Year-Round Cycling Network; and**
- **Review Sidewalk Maintenance Prioritization Process.**

Evolving design and maintenance is an important component in meeting the objectives of Markham's Strategic Plan, increasing safety, accessibility, and comfort for all users, resulting in healthier and more sustainable communities. For new developments, cycling facility selection process, design criteria, and standard cross-sections and engineering drawings are recommended to be updated to be more supportive of active transportation. Walking and cycling can be enhanced by updating the City's traffic calming policies and practices, and considering traffic calming features when planning and designing AT projects. Sidewalk winter maintenance prioritization should be reviewed to consider community destinations, employment centres, major transit stations/stops, and areas with vulnerable populations.

NEW PROGRAM



Design Practices and Guidance for Separated Cycling Facilities and Intersection Treatments: As part of the development of this Active Transportation Master Plan, new design guidelines focused on separated cycling facilities have been developed. These guidelines highlight midblock, intersection and facility transition treatments for cycle tracks and multi-use paths. At intersections, the guidelines focus on protected intersection treatments that provide dedicated waiting space for pedestrians and cyclists within intersection corners, and provide safety enhancements such as a corner refuge island to slow turning vehicles, and median refuge islands.

NEW PROGRAM

Winter Maintenance Pilot Project of a Cycling Spine Network: An important step in growing winter cycling is the designation of a winter cycling network. This network should be comprised of a connected grid of higher-order cycling facilities that are prioritized to receive the highest level of service for snow clearing and de-icing. A winter cycling network provides a predictable, safe network for cyclists, as they know they will be cleared of snow with the highest priority. A pilot project is recommended to identify a winter maintenance cycling spine network and appropriate maintenance practices and equipment , and evaluate the cost, effectiveness and uptake. It could be expanded over time as the winter cycling culture and ridership builds.

EXPANDING PROGRAM

Traffic Calming: Since vehicular speed is directly linked with the safety of vulnerable road users, traffic calming features that help to control and reduce vehicular operating speeds are important as a tool in improving and enhancing cyclists and pedestrian safety and comfort in retrofit conditions. Many of the proposed cycling and pedestrian facilities identified in the ATMP would be enhanced and supplemented through the introduction of traffic calming features in conjunction with the implementation. Therefore, it is recommended that the City routinely consider opportunities to implement traffic calming features to further enhance pedestrian & cyclist projects as they are planned & designed.

IMPLEMENTATION

The foundations of a preliminary monitoring plan have been identified in order to ensure that the recommendations of the ATMP can be implemented effectively. A monitoring program will allow the City to evaluate the progress of this plan and ensure accountability and transparency as the recommendations are implemented. The ATMP recommends using network-based indicators to track the progress of cycling and pedestrian network implementations, as well as using 2016 base data from the Transportation Tomorrow Survey to measure the success of the plan. As a critical document that contributes to realizing the City's Strategic and Official Plans, the ATMP is recommended to be reviewed at least every 5 years.

NEW PROGRAM

Source: HUB/Translink

Annual Tracking of Key Performance Indicators & Development of "State of Cycling Report": Tracking the progress of this plan will help keep it on track and maintain the momentum built by initiatives leading up to this study. Key performance indicators, based on available data, can be used to assess the annual progress of implementing the walking and cycling networks. Travel characteristics can be assessed every five years with data from the Transportation Tomorrow Survey, such as mode share, vehicle ownership rates, short trip characteristics, etc. Another important indicator is injuries and deaths of vulnerable users which can be explored and reported within this report. This information can be developed into a "State of Cycling Report", providing an opportunity for the public to provide feedback to help guide future decision-making. The City will need to develop a cycling data collection program in order to produce a state of cycling report on a five-year basis, and may consider applying a bicycle level-of-traffic stress analysis measuring the comfort of the network as it is upgraded and expanded.

EXHIBIT E-3: SUMMARY OF RECOMMENDATIONS

ACTION	SHORT-TERM (2021-2026)	MEDIUM-TERM (2026-2036)	LONG-TERM (BEYOND 2036)	PROGRAM STATUS
PURSUING PEDESTRIAN NETWORK IMPROVEMENTS				
P1. Continue to fill sidewalk gaps along collector and arterial roads at an accelerated rate through the established Sidewalk Network Completion Program.	Continue	Complete	–	Existing
P2. Implement a program to address Pedestrian Priority Area recommendations on an on-going basis.	Initiate	Review Areas & Continue	Continue	New
P3. Undertake a network screening process to identify priority locations for midblock pedestrian crossings along multi-lane collector roads with the intent of implementing two new or upgraded crossings annually.	Expand	Continue	Continue	Expanded
P4. Continue to implement AODA upgrades at unsignalized intersections once all City signalized intersection upgrades are complete.	Transition from signalized to unsignalized	Continue	Continue	New
P5. Develop a warranting and review program to implement pedestrian safety countermeasures at signalized intersections.	Initiate	Continue	Continue	New
P6. Consider traffic calming measures and vehicle exclusion zones as tools in the School Travel Planning process.	Expand	Continue	Continue	Expanded
P7. Work with School Travel Planning partners to identify candidate pathways for year-round municipal maintenance as a pilot at 5-10 school sites.	Initiate	Continue	Continue	New
CONNECTING & ENHANCING THE CYCLING NETWORK				
C1. Implement linear upgrades to existing cycling facilities to enhance pavement markings, signage and overall comfort.	Initiate	Continue	Continue	New
C2. Review and identify intersection upgrades to existing cycling facilities to enhance pavement markings & signage, provide continuity through intersections and improve the ease of crossings.	Initiate	Continue	Continue	New
C3. Implement cycling facilities along the priority network within a 5-year horizon to significantly improve the connectivity and appeal of the cycling network over the short-term horizon.	Expand & Continue	–	–	Expanded
C4. Advance projects towards completion of the ultimate cycling network plan, including the bundling of cycling facilities with new development, capital projects and standalone interventions.	Expand	Continue	Continue	Expanded
C5. Launch a bicycle parking business partnership program, providing support for businesses wishing to provide and install bike parking.	Expand	Continue	Continue	Expanded
C6. Bundle the delivery of automatic cycling counters with major capital projects including cycling infrastructure.	Initiate	Continue	Continue	New

ACTION	SHORT-TERM (2021-2026)	MEDIUM-TERM (2026-2036)	LONG-TERM (BEYOND 2036)	PROGRAM STATUS
ENCOURAGING OUR COMMUNITY				
E1. Expand the Active Travel to School Pilot program to other school locations throughout Markham.	Expand	Continue	Continue	Expanded
E2. Coordinate with the Bruce's Mill safety village to promote traffic education and encourage active transportation in children.	Expand	Continue	Continue	Expanded
E3. Support and expand the role of Markham Cycles Bike Hub.	Expand	Continue	Continue	Expanded
E4. Continue to support Transportation Demand Management initiatives.	Expand	Continue	Continue	Expanded
E5. Continue to support the growth of annual bike initiatives.	Expand	Continue	Continue	Expanded
E6. Expand Markham's support for Jane's walk through facilitating the organization of more walks and promotional materials.	Expand	Continue	Continue	Expanded
E7. Continue to support the growth of Markham Cycling Day and explore the expansion of Markham Cycling Day into a broader open streets program.	Expand	Continue	Continue	Expanded
E8. Explore the creation of a tactical urbanism materials lab and supportive programming such as Park(ing) day and design workshops. In addition, develop a process that facilitates the safe implementation of tactical urbanism installations by residents.	Initiate	Continue	Continue	New
E9. Support the development of an active transportation lecture/webinar series.	Initiate	Continue	Continue	New
E10. Continue to support the delivery of cycling maps and explore the development of an app-based map. Coordinate with third party trip planning apps (e.g. google) to ensure up to date route information.	Expand	Continue	Continue	Expanded
E11. Continue to support the Bike n' Ride service, coordinate with VIVA to deliver practice opportunities for residents, and explore the provision of a free barrier crossing service.	Expand	Continue	Continue	Expanded
E12. Support York Regional Police in exploring the expansion of their online bike registry program to include an app-based approach.	Expand	Continue	Continue	Expanded
E13. Establish a Cycling and Pedestrian Safety and Awareness Program (CPSAP).	Expand	Continue	Continue	Expanded
E14. Develop a cycling data collection program to support a "State of Cycling Report".	Initiate	Continue	Continue	New
E15. Adopt the York Region Sustainable Mobility Wayfinding Guidelines and identify pilot projects for wayfinding implementation.	Expand	Continue	Continue	Expanded
E16. Develop a communications strategy to build resident awareness of complete streets projects, and safety benefits of road diets and infill sidewalk construction.	Initiate	Continue	Continue	New
E17. Explore expanding the bicycle parking program to include bike valet services at major events.	Expand	Continue	Continue	Expanded
E18. Explore Markham's contribution to a local or regional shared micromobility program.	Initiate	Continue	Continue	New

ACTION	SHORT-TERM (2021-2026)	MEDIUM-TERM (2026-2036)	LONG-TERM (BEYOND 2036)	PROGRAM STATUS
EVOLVING DESIGN & MAINTENANCE				
D1: Adopt updated cycling facility selection guidance for new developments.	Expand	Continue	Continue	Expanded
D2: Adopt updated standard cross-sections for new development including various cycling facilities such as cycle tracks, protected bike lanes and multi-use paths.	Expand	Continue	Continue	Expanded
D3: Incorporate emerging design practices and guidance for separated cycling facilities and intersection treatments into future design and delivery projects.	Expand	Continue	Continue	Expanded
D4: Review current design criteria and standard engineering drawings for new development to ensure AT-supportive design.	Initiate	Continue	Continue	New
D5: Routinely consider opportunities to implement traffic calming features to further enhance pedestrian & cyclist projects as they are planned & designed.	Expand	Continue	Continue	Expanded
D6: Explicitly incorporate the perspective of pedestrian and cycling safety and connectivity as part of the traffic calming warrant and toolbox update.	Expand	Continue	Continue	Expanded
D7: Implement a pilot project to provide winter maintenance of a cycling spine network to evaluate costs and uptake.	Initiate	Review	Review	New
D8: Review sidewalk winter maintenance prioritization processes periodically to capture changes in pedestrian needs and usage patterns.	Review	Review	Review	Expanded
IMPLEMENTATION				
I1: Annually track key performance indicators and develop a “State of Cycling Report.”	Expand	Continue	Continue	Expanded
I2: Review the Active Transportation Master Plan and key recommendations regularly (every 5 years at a minimum).	–	Review	Review	Existing

EXHIBIT E-4: SUMMARY OF COST IMPLICATIONS

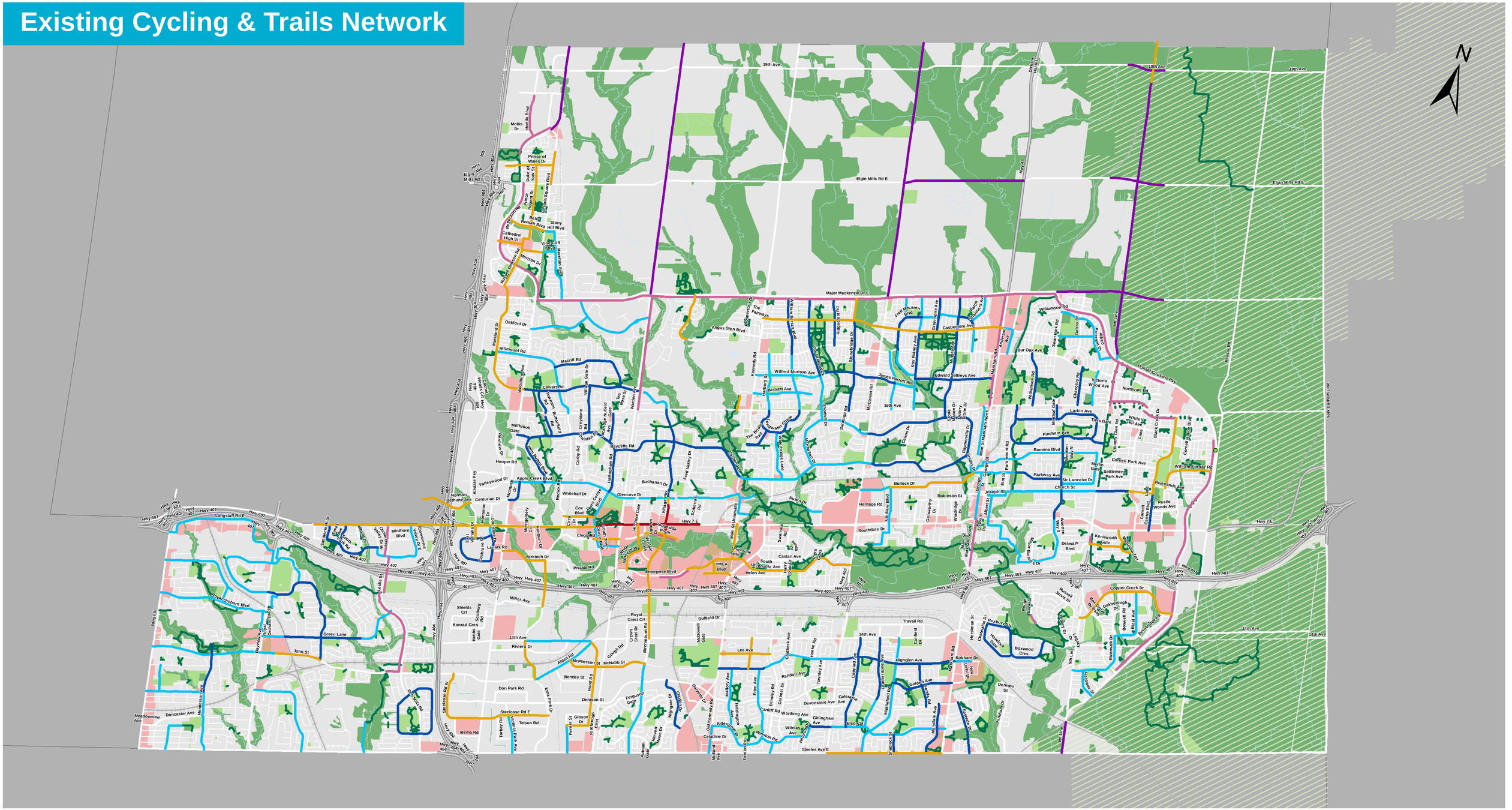
Overall funding envelopes by recommendation theme are shown in Exhibit E-4. Funding requirements will be subject to annual budget review processes and may evolve over time.

THEME	PROGRAMMING COST (ANNUAL)	SHORT-TERM INFRASTRUCTURE COSTS	ULTIMATE INFRASTRUCTURE COSTS
Pursuing Pedestrian Network Improvements	$ 35,000.00	$ 13,050,000.00*	$ 28,250,000.00*
Connecting & Enhancing the Cycling Network	$10,000.00	$ 50,000,000.00	$ 287,000,000.00
Encouraging Our Community	$ 307,000.00	$ –	$ –
Evolving Design & Maintenance	$ 50,000.00	Reflected in infrastructure costs	

*Sidewalk Program costs are subject to change, pending council direction.

NETWORK MAPS

Existing Cycling & Trails Network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Major Mackenzie Dr E
Langstaff Rd E
Hwy 7 E
14th Ave
Steeles Ave E
Hwy 407
Hwy 404
Hwy 48
York Durham Line
Rouge River
Rouge Park
Mobis Dr
Honda Blvd
Prince of Wales Dr
Duke of York Blvd
Prince Regent Dr
Regent Square Blvd
Regent Roman Blvd
Stony Hill Blvd
Cathedral High St
Victoria Gate
Bayview Glen Blvd
Murison Dr
Oakford Dr
Marsland St
Hillmount Rd
Macnill Rd
Woodbine Ave
Calvert Rd
Village Gate Dr
Warden Ave
Millbrook Gate
Greystone Rd
Bucksaw Rd
Bucksaw Gate
Bayliff Rd
Baycliffe Rd
Hooper Rd
Apple Creek Blvd
Valleywood Dr
Alastair Pky
Centurian Dr
Norman Bethune Ave
Whitehall Dr
Glencove Dr
Buchanan Dr
Cox Blvd
Clegg Rd
Lanark Rd
Yorktech Dr
Private Rd
Enterprise Blvd
Minthorn Blvd
Commerce Dr S
Commerce Dr N
Royal Orchard Blvd
Green Lane
John St
Bayview Ave
Doncaster Ave
Meadowview Ave
Henderson Ave
Shields Crt
Konrad Cres
Scolberg Rd
Miller Ave
Royal Crest Crt
Crown Steel Dr
Birchmount Rd
Duffield Dr
Riviera Dr
Aldani Rd
McPherson St
McNabb St
Bentley St
Don Park Rd
Denison St
Steelcase Rd E
Telson Rd
Idema Rd
Torbay Rd
Fernrock St
Gibson Dr
Rankin Gate
Ferguson Gate
Highgate Dr
Gatineau Dr
Old Kennedy Rd
Alderbrook Rd
Celadine Dr
Kingston Rd
Midland Ave
Frontenac Gate
Shuttleck St
Wilclay Ave
Gillingham Ave
Worthing Ave
Cardiff Rd
Brimley Rd
Carmel Dr
Devonshire Ave
Eden Ave
Mallory Ave
Fenchurch Ave
Coppard Ave
Twinney Ave
Randall Ave
Clarkeca Ave
Hoake Rd
Canfield Dr
Travail Rd
Lee Ave
Highglen Ave
Golden Ave
Coleraine Ave
Elson St
Kirkham Dr
Denison St
Kirkham Dr
Boxwood Cres
Hemlock Gate
Horsman St
Roxburgh Dr
Cooper Creek Dr
Oakborough Dr
Bowell Rd
Rizal Ave
Berlingham Rd
Russell Jarvis Dr
Rouge Valley Dr
Rouge Valley Gate
Kenilworth Gate
Delmark Blvd
Mount Joy Bypass
Mount Joy Dr
Mount Joy Gate
Woodbine Bypass
Woodbine Ave
Markham Rd
Main St Unionville
Unionville Gate
Unionville Ave
Helen Ave
Castan Ave
YMCA Blvd
Southdale Dr
Heritage Rd
Ludlow Blvd
Robinson St
Bullock Dr
Austin Dr
Swansea Rd
Main St Markham North
Main St Markham
Sciberras Rd
Village Pky
Fred Varley Dr
Sciberras Rd
Cachet Woods Court
The Bridle Trail
Sandway Cres
Wintergreen Gate
Markham Rd
Calera Dr
Stonehedge Dr
Kennedy Rd
Hunboldt St
Beckett Ave
Wilfred Murison Ave
James Parrott Ave
Roy Rainey Ave
Victoria Square Blvd
Ridgecrest Rd
Greenmore Ave
Castlemore Ave
Fred McLaren Blvd
Angus Glen Blvd
The Fairways
Bur Oak Ave
Williamson Rd
Sawmill Valley Dr
Delray Dr
Chancery Rd
Victoria Wood Ave
Northvale Rd
Larkin Ave
Thies Gate
Fincham Ave
Ramona Blvd
Parkway Ave
Sir Lancelot Dr
Church St
Joseph St
Elm St
Paramount Rd
Main St Markham North
Raymerville Dr
Stone Haven Dr
Stone Dr
Stone Haven Gate
Stone Dr
Sir Plymouth Dr
Sir Galahad Dr
Sir Lancelot Dr
Sir Tristram Dr
Sir Percival Dr
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Sir Ivanhoe Gate
Sir Ivanhoe Dr
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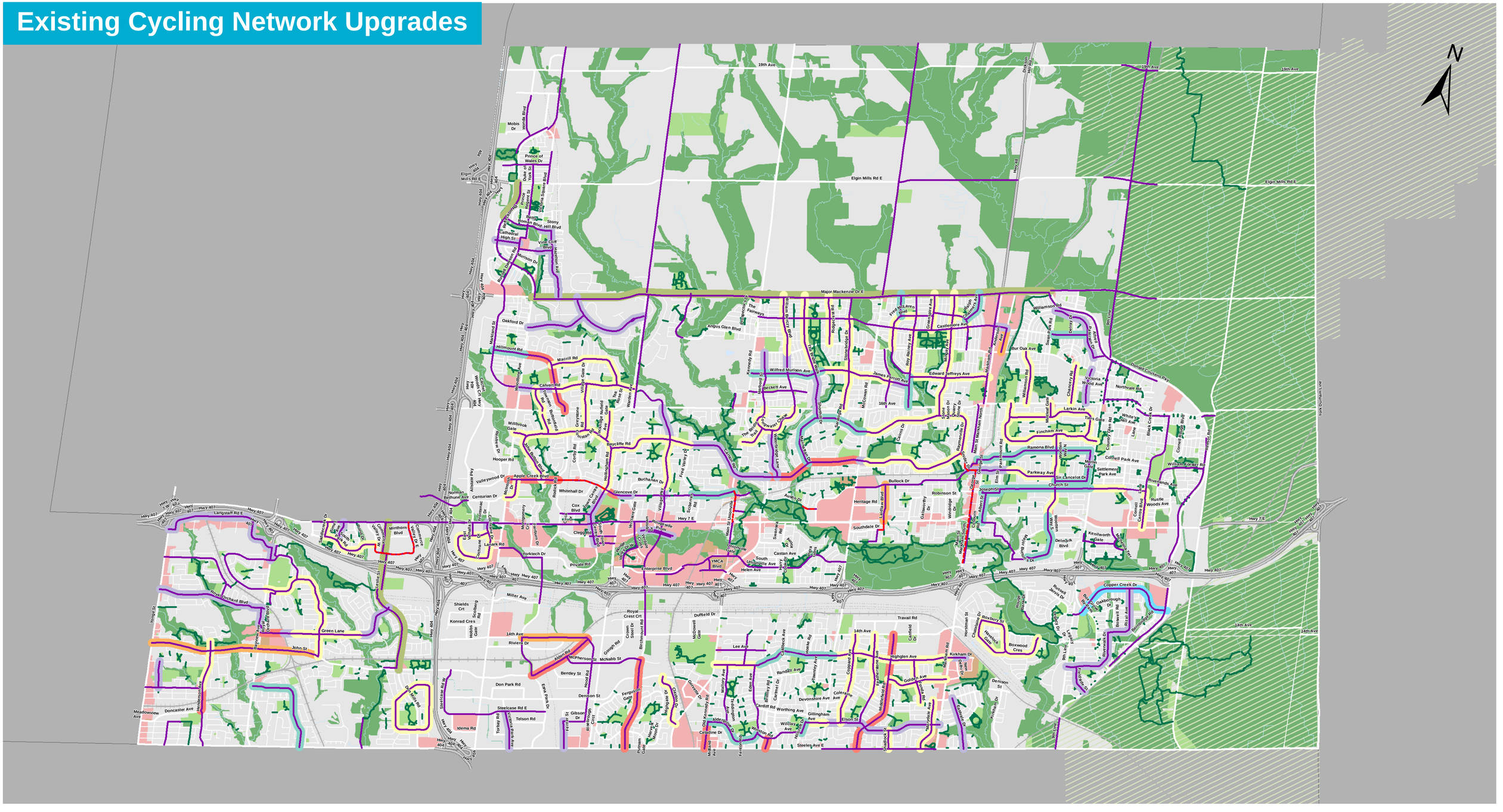
Sir Ivanhoe Dr
Sir Ivanhoe Gate

Existing Cycling Network Upgrades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Hwy 407
Hwy 7 E
York Durham Line
Donald Cousens Pky
Rouge River
Mobis Dr
Honda Blvd
Prince of Wales Dr
Duke of York Blvd
Sonoma Square Blvd
Prince Regent Rd
Stony Hill Blvd
Cathedral High St
Vine Cliff Blvd
Eastation Ave
Murison Dr
Oakford Dr
Marshall St
Hillmount Rd
Macnill Rd
Calvert Rd
Millbrook Gate
Hooper Rd
Valleywood Dr
Apple Creek Blvd
Whitehall Dr
Glencove Dr
Buchanan Dr
Norman Bethune Ave
Centurian Dr
Alsasua Pky
Minthorn Blvd
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Lanark Rd
Yorktech Dr
Private Rd
Enterprise Blvd
Royal Orchard Blvd
Green Lane
John St
Shields Crt
Konrad Cres
Miller Ave
14th Ave
Riviera Dr
Don Park Rd
Steelcase Rd E
Telson Rd
Idema Rd
Doncaster Ave
Meadowview Ave
Henderson Ave
Bayliffe Rd
Fred Varley Dr
Cox Blvd
Cleggrove Rd
Aurelian Dr
Villagewalk Pky
Main St Unionville
Unionville Gate
Castan Ave
YMCA Blvd
Helen Ave
South Unionville Ave
Southdale Dr
Heritage Rd
Bullock Dr
Robinson St
Church St
Josephine St
Parkway Ave
Sir Lancelot Dr
Ramona Blvd
Fincham Ave
Larkin Ave
Thirs Gate
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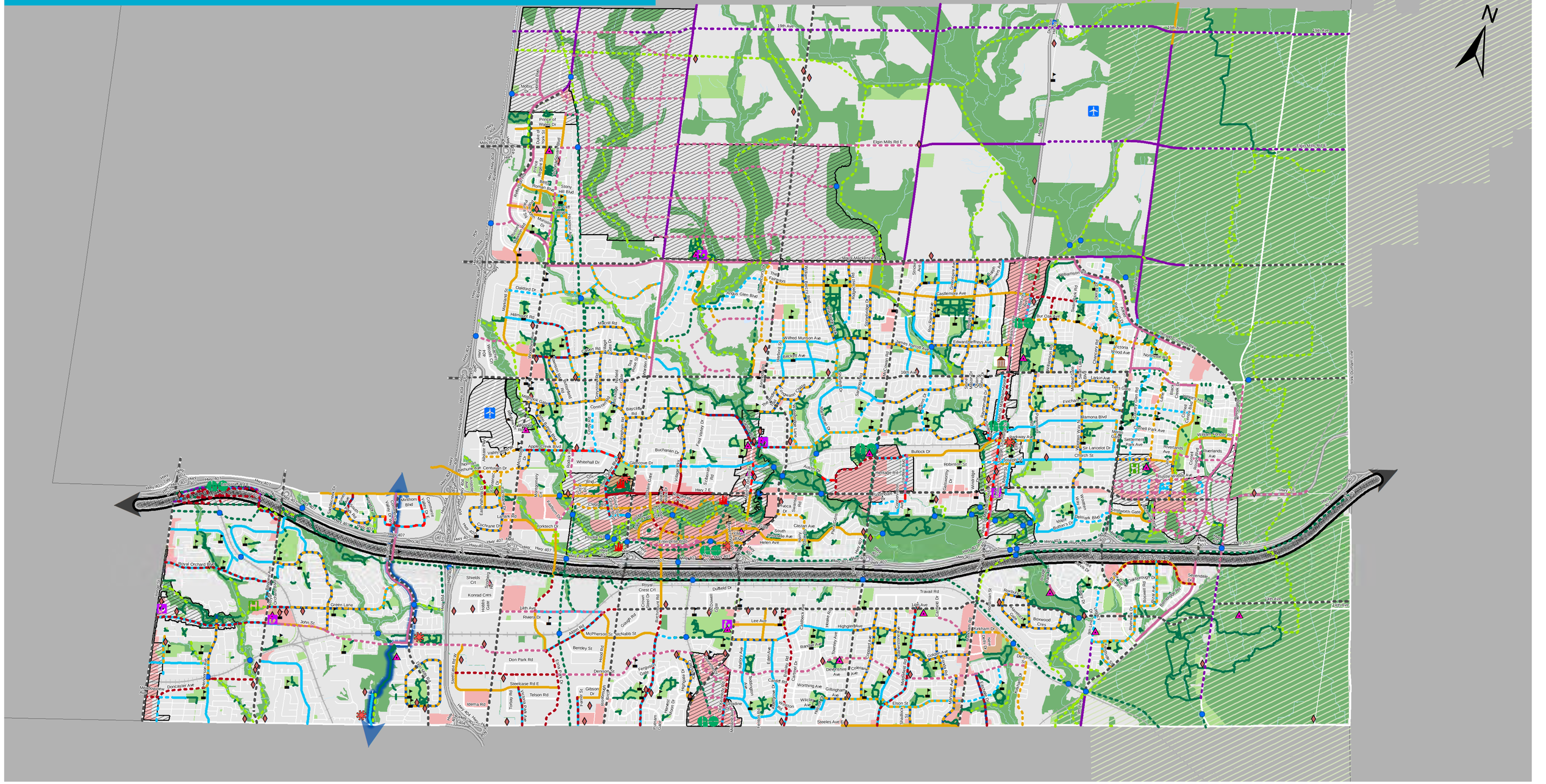
Cornell Park Ave
Cornell Centre Blvd
Cornell Rouge Blvd
Rustle Woods Ave
Sherlands Ave
Williamson Rd
Bur Oak Ave
Edward Jeffreys Ave
James Parrott Ave
Wilfred Murison Ave
Castlemore Ave
Fred McLaren Blvd
Green Lane
Angus Glen Blvd
The Fairways
Ridgecrest Rd
Stonebridge Dr
Kennedy Rd
Hunboro Rd
Roy Rainey Ave
Mickleborough Dr
Mystic Pond Dr
Sheltered Pine Dr
Sandy Ridge Trail
Sandy Pine Rd
Sonoma Dr
Stone Haven Dr
Stone Haven Cres
Stone Haven Dr
Stonehaven Dr
Raymerville Dr
Main St Markham North
Williamson Rd
Delray Dr
Pine Valley Dr
Pine Valley Cres
Pine Valley Dr
Pine Valley Dr
Pine Valley Dr

Proposed Ultimate Cycling Network & Context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Yonge St
Bayview Ave
Leslie St
Woodbine Ave
York-Durham Line
Markham Rd
Main St Unionville
Main St Markham
Kennedy Rd
Warden Ave
Birchmount Rd
Pickering Parkway
Whitevale Rd
Ninth Line
Reesor Rd
Donald Cousens Pkwy
Cornell Centre Blvd
Markham Civic Centre
Markham Museum
Markham Theatre
Cornell Community Centre
Milliken Mills Community Centre
Unionville Library
Thornhill Community Centre
Angus Glen Community Centre
Markham Stouffville Hospital
Markham Fairgrounds
Rouge National Urban Park
Rouge Beach
Rouge Valley
Toogood Pond
Milne Dam Conservation Park
Bruce Creek Park
Berczy Park
Berczy Glen
Cathedral Park
Cedarwood Park
Centennial Park
Cornell Park
Crosby Park
Fairtree Park
Fincham Park
Flato Park
Glen Cedar Park
Glen Shields Park
Greenwood Park
Hagerman Park
Heritage Park
Highland Park
Hillcrest Park
Hunter's Point Park
Kirkham Park
Lincoln Park
Meadowcrest Park
Mount Joy Park
Old Unionville Park
Parkland Park
Pomona Park
Rodick Park
Rouge Park
Settlement Park
Sherwood Park
Swan Lake Park
Thomas Park
Toogood Pond Park
Victoria Park
Wismer Park
Woodland Park
Yorkshire Park
Zion Park
Markham Green Trail
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Unionville Trail
Bruce Creek Trail
Berczy Creek Trail
Rouge River Trail
Robinson Creek Trail
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Milne Dam Trail
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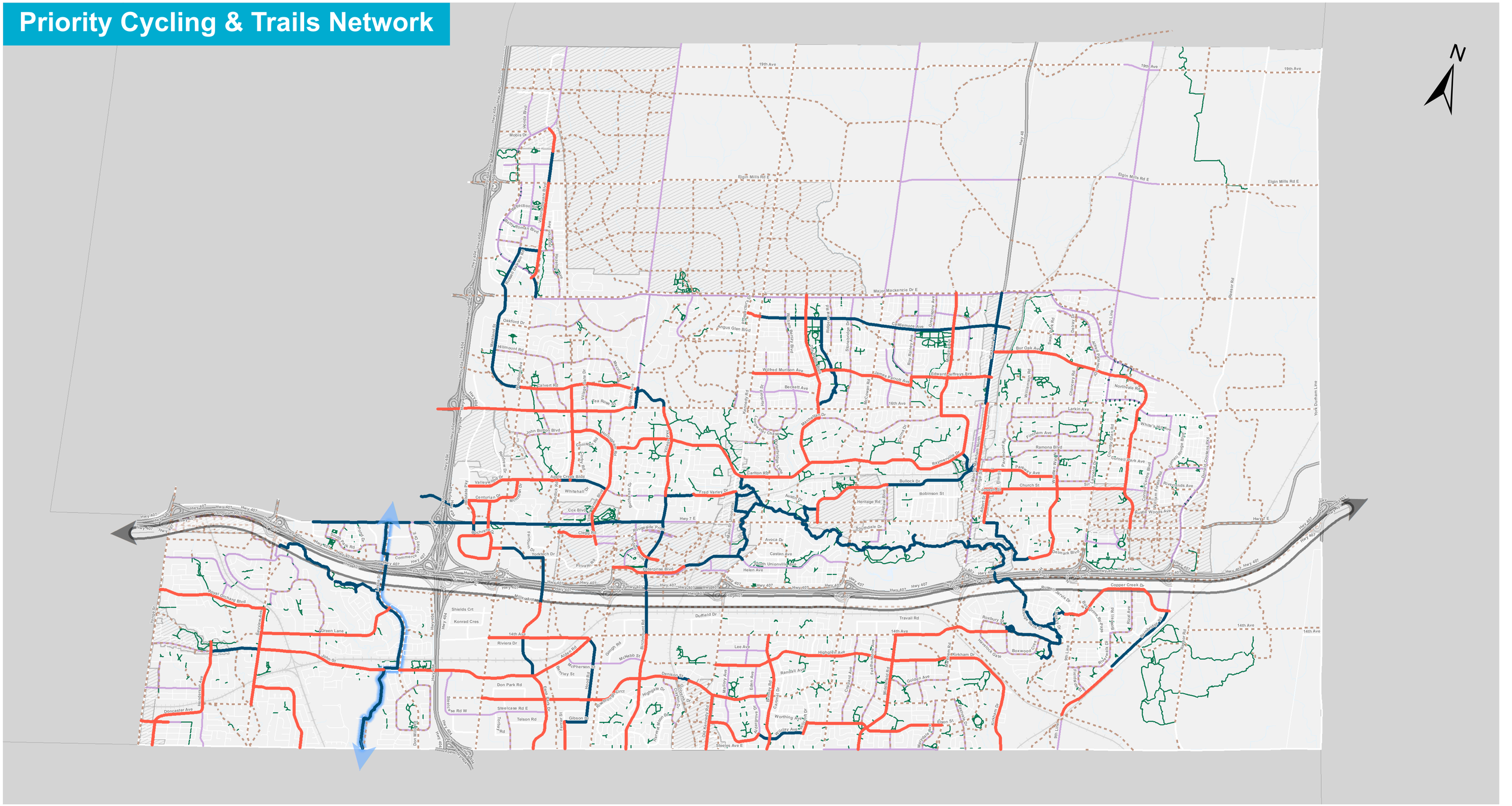
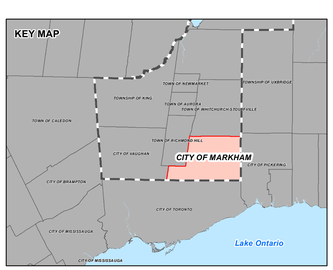
Bullock Dr
Church St
Robinson St
Heritage Rd
Buchanan Dr
Whitehall Dr
Glencove Dr
Village Pkwy
Alexa Dr
Castan Ave
South Unionville Ave
Helen Ave
Pinehurst Rd
Yorktech Dr
Lamark Rd
Cochrane Dr
Commerce Valley Dr W
Commerce Valley Dr E
Enterprise Blvd
Esna Park Dr
Apple Creek Blvd
Valleywood Dr
Normandy Dr
Centurian Dr
Bur Oak Ave
Williamson Rd
Castlemore Ave
Wilfred Murison Ave
Edwards Jeffreys Ave
James Reaman Ave
Victoria Wood Ave
Norman Rd
Laxton Ave
Fincham Ave
Ramona Blvd
Cornell Park Ave
Settlement Park Ave
Riverlands Ave
Sir Lancelot Dr
Bayview Glen Rd
Bayview Hill Rise
Bayview Country Club Rd
Bayview Golf & Country Club Rd
Bayview Fairways Dr
Bayview Ridge Rd
Bayview Wood Ct
Bayview Glen Public School
Bayview Secondary School
Bayview Ave
Bayview Glen
Bayview Fairways
Bayview Ridge
Bayview Wood
Bayview Golf & Country Club
Bayview Country Club
Bayview Hill Rise
Bayview Secondary School
Bayview Glen Public

Priority Cycling & Trails Network





- Proposed Priority Network
- Existing Priority Network
- Existing Cycling Network
- Proposed Cycling Network
- Existing Trail
- Lake to Lake Route
- Proposed South York Greenway Cycling & Pedestrian Corridor
- Highway / Freeway
- Arterial or Collector Road
- Local Road
- Watercourse
- Rail Line
- Waterbody
- Details of Cycling Network Subject to Secondary Plans

0 1 2 KM

1:30,000

Coordinate System: NAD 1983 UTM Zone 17N

ride & stride MARKHAM ACTIVE TRANSPORTATION - MASTERPLAN -

IBI

MARKHAM