FINAL REPORT

Toronto Ten Year Cycling Network Implementation Plan

Connect, Grow, Renew

Submitted to City of Toronto
by IBI Group Professional Services (Canada) Inc.
in association with Vélo Québec

Table of Contents

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

List of Exhibits

Table of Contents (continued)

Table of Contents (continued)

Table of Contents (continued)

Glossary of Terms

Area 1	For the purpose of this study, the city was divided into two context areas, recognizing that levels of cycling activity and demand differ in each. Area 1 consists of the more compact central area of the city, where there is further evolution of a maturing cycling network and culture. There are opportunities to "connect" and "renew" the network by completing missing links and improving the quality of cycling routes. See also Area 2. This area is shown on the maps illustrating the potential cycling impact analysis in Section 5. The boundary between the two areas is intended to provide guidance only in the application of some of the cycling impact criteria.
Area 2	For the purpose of this study, the city was divided into two context areas, recognizing that levels of cycling activity and demand differ in each. Area 2 consists of the more suburban built environment surrounding the central area (Area 1). The existing cycling network is less extensive, with more opportunities to “grow” into new parts of the city not served by the network. See also Area 1 This area is shown on the maps illustrating the potential cycling impact analysis in Section 5. The boundary between the two areas is intended to provide guidance only in the application of some of the cycling impact criteria.
Bicycle Boulevard	A cycling route along connected, Quiet Streets (see below) with traffic calming, wayfinding signage and “sharrow” pavement markings that make it comfortable and efficient for cyclists to use these streets. Sometimes they are referred to as neighbourhood greenways.
Bike Plan	The City of Toronto Bike Plan was adopted by City Council in 2001. This overarching policy document included a variety of cycling-related recommendations, including guiding principles and objectives for the design of Toronto’s Cycling Network. This Ten Year Implementation Plan report supersedes Bike Plan Recommendations 5-4, 10-2 and Appendix C, as it provides updated information surrounding the resourcing required for the delivery of Cycling Network Infrastructure in the City of Toronto.
Bikeway Trails Plan	The City of Toronto *Bikeway Trails Implementation Plan*, adopted by City Council in 2012. The Trails Plan sets out the vision for where and how Toronto will build trails until 2021.
Centreline Kilometres	The length of a facility, i.e. road, bikeway, sidewalk, etc., measured along the centreline, or along the middle, of the road. For bike lanes, typically the lane kilometres measured along the length of each bike lane are twice as long as the centreline kilometres. Centreline kilometres are typically used to provide an overall measure of how much of the roadway network has facilities.

Contraflow Bicycle Lane	Contraflow bicycle lanes allow cyclists to travel in two directions on a street that is one-way for all other vehicles. Cyclists travel in the designated contraflow bicycle lane in the opposing direction from the one-way direction of all other vehicles. Cyclists traveling in the one-way direction with all other vehicles typically ride in a mixed-use traffic lane or in a marked bicycle lane in that direction. Bicycle symbols and diamonds are used to mark the lane. The diamond symbol is the symbol for a "reserved" lane. The "contra flow" bicycle lane will also have arrows painted in the lane, communicating that the bicycle lane is to be used in only one direction.
Cycling Impact Analysis	Measures applied to prospective City of Toronto Ten Year Cycling Network Implementation Plan Projects, to evaluate their benefit to the overall design of Toronto's network.
Cycling Network Plan	The collection of on-street and off-street cycling routes that form a network. It is used as a policy design tool that stipulates locations and standards where the inclusion of cycling infrastructure as an integrated component of the broader road transportation system must be accommodated. Appendix E includes maps of the existing and proposed Cycling Network for the city of Toronto.
Cycling Network Facility	Infrastructure that facilitates cycling. Standards for Cycling Network facilities are described at a high level in this report, and in detail by the City of Toronto's Bikeway Design Guidelines.
Cycling Network Route	May refer to both dedicated and non-dedicated cycling routes which make up the City of Toronto's Cycling Network, but must adhere to minimum standards for cycling network facility design.
Cycling Unit	Refers to the group of staff from Cycling Infrastructure and Programs that deliver the Cycling Network Infrastructure, within the City of Toronto's Transportation Services Division.
Fast Busy Street	A street with a lot of motor vehicles and traffic is moving quickly; this makes most cyclists feel unsafe. For these types of streets a dedicated cycling facility such as a bicycle lane, buffered bicycle lane or cycle track can help keep cyclist and motor vehicle traffic separate. See also Quiet Street below.
Implementation Scenarios 1 through 5	Refers to five (5) capital budget funding scenarios outlined in Appendix E of this report. The City of Toronto Ten Year Cycling Network Implementation Plan analyzed the amount of linear infrastructure that would be delivered at each funding level.
Major Corridor Study	Fast busy streets (see above), which support high levels of commercial activity or a very high number of motor vehicle trips, may require a deeper level of study, consultation and investment.
OP	The City of Toronto Official Plan. The Official Plan sets out the vision for where and how Toronto will grow to the year 2031.
Quiet Street	A street that is quiet and has slow-moving motor vehicle traffic; there is no need to make a dedicated cycling facility. Traffic calming, wayfinding signage and "sharrow" pavement markings can help build bicycle boulevards that are comfortable for every type of cyclist. See also Fast Busy Streets above.

Ten Year Plan	The City of Toronto Ten Year Cycling Network Implementation Plan will serve as a comprehensive roadmap and work plan, outlining the investments planned by the City of Toronto's Cycling Unit over 2016-2025

Executive Summary

The Ten Year Cycling Network Implementation Plan will serve as a comprehensive roadmap and work plan, outlining the investments planned by the City of Toronto's Cycling Unit over 2016-2025. This report provides an overview of the process undertaken to develop the Ten Year Implementation Plan and describes the five implementation scenarios brought to City Council for consideration in the 2017 Capital Budget process. Scenario 3, as detailed in this report, is the staff recommended implementation scenario.

The Ten Year Cycling Network Implementation Plan will build on the city's existing network of cycling routes by identifying potential Cycling Network projects to fulfill the project mandate to:

- Connect the gaps in our existing Cycling Network;
- Grow the Cycling Network into new parts of the city; and,
- Renew the existing Cycling Network routes, to improve their quality.

Since November 2014, a significant amount of analysis and consultation was undertaken to inform the recommendations in this report. Extensive field work to inform new route feasibility was undertaken to identify and assess each of the routes proposed in the Plan.

The proposed Ten Year Plan identifies approximately 550 centreline kilometers (km) of new infrastructure (if counted in each lane direction, this proposed network constitutes more than 1000 lane km). This proposed new network includes:

- 280 centreline km of bicycle lanes or cycle tracks on Fast Busy Streets;
- 55 centreline km of sidewalk-level boulevard trails along Fast Busy Streets; and,
- 190 centreline km of cycling routes along Quiet Streets.

Included within this proposed network was approximately 100 centreline km along eight arterial roadways (split into seventeen segments) for which Major Corridor Studies would be undertaken to evaluate the feasibility of bicycle lanes or cycle tracks.

The deliverables recommended by Transportation Services in this report represent the outcome of Cycling Impact Analysis, feasibility analysis, capital works coordination and consultation.

A number of the significant trail projects were included in the 2012 Trails Plan and are therefore already approved. The recommended network in the Ten Year Cycling Network Implementation Plan has been designed to include these approved trails as well as routes that are part of approved LRT projects. This implementation plan also recognizes numerous studies being undertaken by other divisions or agencies, which may afford opportunities for additional routes to be added to the network.

As per Council approval, Transportation Services will have the authority to initiate the studies, detailed design and public consultation required to deliver the cycling infrastructure projects contained in the Ten Year Cycling Network Implementation Plan. During project implementation, Transportation Services will work with local area councillors and stakeholders, i.e. TTC, Metrolinx, utilities, etc., and undertake public consultation as part of the preliminary design process.

The intention of this plan is not to preclude opportunities for cycling projects, which may be supplemental to the proposed network. The purpose of this report, and its recommendations, is to ensure that within a coordinated capital program, the necessary resourcing is available to install and study cycling infrastructure annually. All projects have undergone a feasibility assessment to ensure a sound business case for their inclusion within Toronto's Cycling Network. Each program scenario has been designed to ensure the targets match stable capital funding and staff resourcing required to deliver the recommended projects.

1 Introduction

1.1 Objectives of the Ten Year Cycling Network Implementation Plan

Connect – Grow – Renew:
Building Toronto's Cycling Network over the Next Ten Years

The objectives of the Ten Year Cycling Network Plan are:

- **Connect** the gaps in our existing Cycling Network;
- **Grow** the Cycling Network into new parts of the city; and,
- **Renew** the existing Cycling Network routes, where there are opportunities to improve their quality.

The routes recommended in the Ten Year Cycling Network Implementation Plan have been designed to enhance the existing network in Toronto's central area. The projects recommended will connect network gaps by adding new routes and will renew existing routes to improve their quality. Routes that would grow the cycling network into neighbourhoods outside the city centre considered network recommendations from the 2001 Bike Plan and took a fresh look at new options. For these more suburban areas, infrastructure designs that provide more physical separation from motor vehicle traffic may be more desirable to increase cyclists' comfort. It is anticipated that recommendations for boulevard trails may help to ensure the Cycling Network routes identified would provide a comfortable cycling environment for a wide range of people.

The Ten Year Cycling Network Implementation Plan will recommend the type of cycling route appropriate for each project based on the street and land-use characteristics, including how busy the street is, how fast the traffic is moving and the space available within the roadway and boulevard. The appropriate type of Cycling Network facilities are described at a high level in this report; design guidance will be provided by the City of Toronto's Bikeway Design Guidelines.

The Ten Year Plan will identify cycling network projects to be constructed by Transportation Services' Cycling Unit starting in 2016 for the next 1-5 years and 6-10 years and the annual capital funding requirements to implement the plan. The recommendations in this implementation plan will help to ensure adequate, stable funding for Transportation Services' cycling program.

1.2 Background

Bike lanes, cycle tracks, multi-use trails, and bicycle boulevards all link together to help build a connected Cycling Network. The Toronto Cycling Network Implementation Plan was designed to build on Toronto's existing Cycling Network, which in 2015 included approximately 6 centreline km of cycle tracks, 107 centreline km of painted bicycle lanes, 148 centreline km of signed shared roadway routes and 294 centreline km of multi-use trails.

1.3 The Need for a New Implementation Plan

In August 2001 Toronto's City Council approved the 2001 Bike Plan. This ambitious policy document included 42 recommendations which have provided direction in 6 areas; Bike Parking Infrastructure, Cycling and Transit Programs, Safety and Education Programs, Promotion Activities, Standards for Bicycle Friendly Streets and the Direction to develop a Cycling Network.

This Ten Year Cycling Network Implementation Plan revisits the routes identified as well as the cycling route designs used in recommendation 5.1 of the 2001 Toronto Bike Plan. An updated Cycling Network Implementation Plan is needed because:

- In the downtown core, **most of the Cycling Network routes recommended in 2001 have now been installed**;
- **Ridership has grown** and additional cycling routes are needed to serve the high demand in Toronto's downtown core;
- **New types of cycling infrastructure designs** means that the roads which may best serve the cycling network have changed. New infrastructure options will allow for different streets to be evaluated in both the downtown core and the city's suburban neighbourhoods;
- **Our transportation infrastructure is aging**, and many of our assets require significant rehabilitation. Bundling cycling infrastructure into the delivery of major capital road resurfacing or reconstruction projects will realize cost savings to build the cycling facilities;
- **Congestion on our roads** and expressways costs Toronto commuters an estimated $1.4 billion annually[i];
- Cycling fosters **health benefits,** as a form of chronic disease prevention. In the city of Toronto, the total savings from these prevented deaths range from $130 million to $478 million annually (depending on how deaths are valued)[ii];
- The cost to travel by bicycle is far lower than travelling by automobile. Infrastructure which supports financially affordable travel options contributes to poverty reduction and **social benefits;**
- Supporting cycling presents important **environmental benefits**, as motor vehicles continue to account for approximately one-third of greenhouse gas emissions from the city[iii]. Facilities which make cycling safe and practical will enable more people to leave their cars at home; and,
- Travel by bicycle encourages shorter trips than auto travel which yields **economic benefits** for smaller community-based shops and businesses. For example, one case study in Toronto shows customers arriving by foot or on bike reported spending more than those arriving by car or transit. Those who lived nearby were 2.6 times more likely to spend more than $100 per month than those arriving from farther away[iv].

1.4 Cycling Network Investment Benefits

1.4.1 Toronto's Growth since 2001

The city's population is increasing by almost 40,000 people annually. 151 high-rise buildings were under construction in 2013. This increase in population density means more people may choose to cycle for short trips.

Exhibit 1-1: Cycling on College Street West[v]

Over 143,000 new dwelling units were constructed in the city of Toronto between 2006 and 2016. 80% of these were mid to high-density developments, with buildings greater than 5 storeys. Increasingly, families with children are calling these buildings home. In 2011, 10,000 more families with children and youth lived in high-rise buildings than in 1996.[vi].

As the city grows and changes, this presents an opportunity to improve how Toronto's transportation systems operate. The City of Toronto's *Complete Streets Guidelines*[vii] will seek new and innovative ways to build public spaces which work for all modes of travel. And we can make on-the-ground changes – large and small, short-term and long-term – that will help Toronto's transportation systems better meet the needs of all users.

The challenges related to aging infrastructure will be amplified over the next five years. The installation of cycling infrastructure may be a more affordable option, to update roads previously designed exclusively for motor vehicle travel.

A successful city requires a transportation system that is safe for people of all ages and abilities. Over the past ten years, Toronto's streets have become safer for all road users. Total traffic-related fatalities have dropped by 41%, from an average of 74 per year from 1998 to 2002, to an average of 44 per year from 2008 to 2012. Pedestrian fatalities have dropped by 37% over the same period, from an average of 38 to an average of 24 per year. At the same time, the city's population has increased.

While Toronto is outperforming many other North American cities, there is still room for improvement. In 2012, over 50,000 collisions were reported, resulting in 44 fatalities, and societal costs of almost $2 billion. Toronto is committed to enhancing transportation safety for all users.

Toronto's *Vision Zero Road Safety Plan*[viii] is a comprehensive five-year (2017-2021) action plan focused on reducing traffic-related fatalities and serious injuries on Toronto's streets. With over 50 safety measures across six areas of emphasis, the Plan prioritizes the safety of our most vulnerable road users. For additional information about the Road Safety Plan please see Section 2.5 of this report.

1.4.2 Updating Standards for Cycling Facility Designs

The Cycling Network described in the 2001 Bike Plan included only painted bicycle lanes, signed shared roadways, and multi-use trails. Since the 2001 Bike Plan, there are new types of cycling facilities being implemented in Toronto:

- In 2001 separated bike lanes (cycle tracks) were a type of cycling infrastructure that was not yet being widely implemented in North America. They are now being considered and constructed in cities of all sizes on fast busy streets to improve the comfort of cyclists and attract people who are uncomfortable riding in traffic to cycling;
- Similarly, Toronto's new cycling wayfinding standards[ix] will allow for signed, shared roadway routes on Quiet Streets to be enhanced with the use of wayfinding signs and sharrow pavement markings. These enhance the cohesion and visibility of the Quiet Street network; and,
- In 2001, multi-use trail opportunities were looked at extensively in rail corridors, hydro corridors and other green spaces. Multi-use path connection opportunities in the boulevard were less widely explored as they are more costly to build than painted bicycle lanes. Today, there is greater appetite to invest in cycling facilities (multi-use trails or cycle tracks) located in the boulevards of fast busy streets as these facilities are more comfortable for cycling than painted bicycle lanes.

Exhibit 1-2: The Appetite is Growing for Infrastructure Designs that Support a Wider Range of Cycling Ages and Abilities

1.4.3 Safety

Toronto's City-wide Cycling Study, conducted by Transportation Services in 2009, found that there is potential to move 44% of recreational cyclists to cycle for practical purposes by improving the safety of cycling in the city through creating more bike lanes, paths, and safer road conditions.

The provision of cycling infrastructure would support safety for both residents and non-residents.

1.4.4 Health Benefits

Active transportation (walking and cycling) is a means to improve health and quality of life in Toronto. Some of the significant benefits, as outlined in *Road to Health: Improving Walking and Cycling in Toronto* (Toronto Public Health, April 2012) include the following:

- In the city of Toronto, traffic-related pollution was estimated to cause 440 premature deaths, 200,000 restricted activity person-days and 1,700 hospitalizations per year in 2007. Mortality costs alone were valued at $2.2 billion (Toronto Public Health 2007). Cycling is a form of active transportation, which does not contribute to traffic-related air pollution;
- In Toronto, over 40% of adults and 22% of adolescents are overweight or obese (Toronto Public Health 2010). Increasing the active transportation mode share could

help to improve physical fitness and reduce the proportion of Torontonians who are overweight or obese;

- Reductions in cardiovascular disease, diabetes, stroke and cancer are important for the city of Toronto, given the increasing rates of chronic disease. Rates of self-reported diabetes doubled from 4% to approximately 8% between 2001 and 2008 among Torontonians 12 and older, while high blood pressure increased from 12% to 15%. Circulatory diseases are responsible for more than 1 in 4 deaths in Toronto each year; breast and colorectal cancers alone are responsible for over 5% of deaths in Toronto (Statistics Canada 2011). Increasing the active transportation mode share could help to increase daily cardiovascular activity of Torontonians;
- Physical activity has a demonstrated positive effect on a range of mental illnesses. Physical activity has also been found to reduce the symptoms of depression, anxiety and panic disorders, with beneficial effect equal to meditation or relaxation (Paluska and Schwenk 2000); and,
- A Canadian study calculated that physical inactivity alone is directly associated with $1.6 billion in annual health care costs in Canada, or 1.5% of all Canadian health care costs (Katzmarzyk and Janssen 2004). Each additional 10% increase in physical activity in Canada would translate to annual direct health care savings of up to $150 million (Katzmarzyk et al. 2000).

1.4.5 Social Benefits

In Toronto, only 66% of adults report a strong sense of belonging to their local community (Statistics Canada 2011). As stated in the Official Plan (City of Toronto 2010a), developing walkable and bikeable neighbourhoods and communities may help to fulfill Toronto's vision of "creating an attractive and safe city that evokes pride, passion and a sense of belonging".

Exhibit 1-3: Cycling Facilities Help to Create Vibrant Destination Areas[x]

While cycling is often identified for its environmental benefits, it should also be recognized as a financially sustainable type of transportation. When the built environment provides safe cycling infrastructure, cycling can serve as a mode of travel that costs individuals less than driving or taking public transit. Toronto's Poverty Reduction Strategy states that 46% of recent immigrants live in poverty, 37% of female lone parents live in poverty and 33% of people in racialized groups live in poverty. Recommendation 9.3 of Toronto's Poverty Reduction Strategy suggests that Toronto will "Develop a capital and service planning approach that focuses on building infrastructure improvements faster and meeting the immediate needs of the inner suburbs."

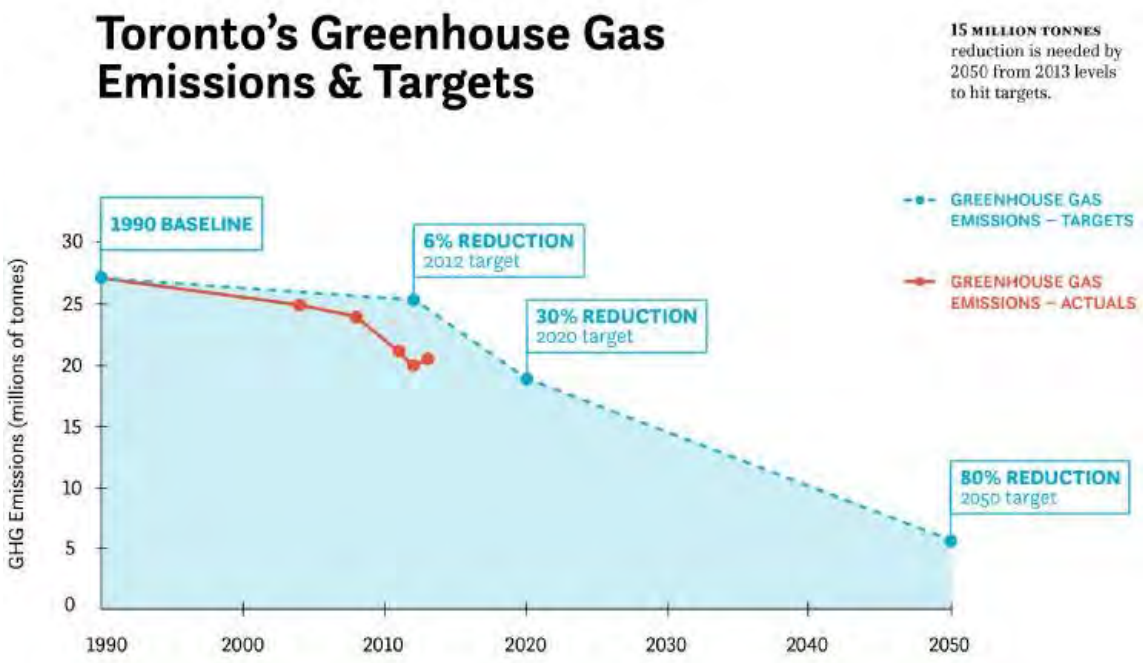
On significant civic streets such as Queens Quay, the provision of cycling infrastructure is an important component when place-making vibrant social spaces. Supporting cycling offers

distinct opportunities to define streets as human-scale places, which attract cultural events and tourism.

1.4.6 Environmental Benefits

Recognizing that climate change is one of the most important issues of our time, Toronto's City Council unanimously adopted Toronto's *Climate Change Action Plan* in 2007[xi]. The plan set bold targets for the reduction of greenhouse gas emissions, and outlined actions for the City to create a sustainable energy future. Toronto's greenhouse gas reduction targets, based on 1990 levels of approximately 22 million tonnes per year, city-wide, are 30% by 2020 (6,600,000 tons per year) and 80% by 2050 (17,600,000 tons per year).

Exhibit 1-4: Toronto's Greenhouse Gas Emissions & Targets



Cycling uses minimal fossil fuels and is a pollution-free mode of transport. Bikes reduce the need to build, service and dispose of cars. Cycling 5 km each way to work would save 750 kg[xii] of greenhouse gas emissions each year. Cycling for short trips provides an alternative to motorized modes of transportation, which contribute to climate change. In addition, as cycling produces no emissions, it does not contribute to smog or noise pollution.

The City of Toronto's *Power to Live Green* report[xiii] identifies Toronto's cycling infrastructure planning as a mechanism to realize the City's greenhouse gas emissions targets.

1.4.7 Economic Benefits

Toronto is a vibrant city of neighbourhoods. Toronto's neighbourhoods have been made possible in part by mixed use zoning policies instituted by Toronto's City Planning department in the 1980s and 1990s. Today, Toronto's Avenues support commercial activity, blended with nearby residential units. As a result many residents are within walking or biking distance from local shops and businesses. In contrast to many North American cities where residential units are located away from commercially zoned areas, the City of Toronto's Avenues ensure origins and destinations are often a distance which can be cycled.

A number of studies have been undertaken by the Toronto Centre for Active Transportation (TCAT) and the University of Toronto. A study of the Danforth found that those who live or work in the area visited local shops more frequently than those who do not: 78% of those who live in the area visited more than five times per month whereas only 23% of those who do not live or work in the area will visit more than five times per month. Those who live or work in the Danforth area spend more money than those who do not: 62% of those who live in the area spend over $100 per month whereas only 10% of those who do not live or work in the area spend over $100 per month. Shorter trips can be taken efficiently on foot or by bicycle. These studies found that merchants tend to overestimate the number of people who drive to get to their businesses.

Surveys undertaken by TCAT on both Danforth Avenue and Bloor Street found that a majority of respondents preferred to see street use reallocated for streetscaping and safety projects such as widened sidewalks or a bike lane. Interestingly, even the majority of surveyed respondents who identified as drivers demonstrated support for streetscape changes.

2 Background & Related Studies

The following studies provided background, related information, or recommendations which were incorporated into this Plan.

2.1 Toronto Bike Plan

The *Toronto Bike Plan*[xiv] was the first cycling master plan for the newly amalgamated City of Toronto adopted by Council, 2001. It recommends, among other things, a long-term, city-wide Bikeway Network consisting of bicycle lanes, signed routes and trails. The network objective was to create a grid of bikeways spaced approximately two kilometres apart so that all residents would be no more than one kilometre from a designated bikeway. Where bike lanes on arterial roads could not be accommodated due to impacts on motor vehicle parking or traffic, the grid gaps were filled with signed routes on parallel local roads.

2.2 Bikeway Network – 2011 Update

This Transportation Services staff report adopted by Council[xv] confirmed Council's implementation priorities for 2010-2014 to accelerate the construction of the trails component of the network and upgrade and expand the downtown network of bike lanes by constructing cycle tracks.

2.3 Bikeway Trails Implementation Plan

City Council, at its meeting of June 6, 2012, adopted the *Bikeway Trails Implementation Plan*[xvi]. This Plan included 26 new trail projects totalling an additional 77 km of bikeway trails, as illustrated in Exhibit 2-1.

The majority of near-term (years 1-5) projects identified in the *Bikeway Trails Implementation Plan* have been initiated. A review of the projects identified for years 6-10 was undertaken by City of Toronto staff to evaluate the needs of the trails program, within the broader context of the Cycling Network Ten Year Implementation Plan.

EXHIBIT 2-1
BIKEWAY TRAILS PLAN
Approved by Council June 6, 2012

TOWN OF RICHMOND HILL

CITY OF MARKHAM

CITY OF PICKERING

CITY OF VAUGHAN

CITY OF BRAMPTON

CITY OF MISSISSAUGA

LAKE ONTARIO

Legend

- Proposed Connection
- Existing Multi-Use Trail
- Park Road
- Rail Line
- Freeway
- Major Road
- Green Space

0 3 6 km

N

Data source: City of Toronto / IBI Group, 2016
Projection: NAD 1927 MTM 3

Date: July 2016
Cartography: Vélo Québec

2.4 Official Plan Draft Cycling Policy Framework

The Official Plan Review of Transportation Policies includes new text to establish a bicycle policy framework, and revised text that strengthens the existing policy that promotes cycling. The new policies, currently in draft form, are proposed as part of *Section 2.4 Bringing the City Together: A Progressive Agenda of Transportation Change.*

The new text explains that guidelines, programs and infrastructure will be developed and implemented to create safe, comfortable and bicycle-friendly environments that encourage people of all ages to bicycle for everyday transportation and recreation. The draft policies focus on ways to expand the cycling network, enhance the convenience and attractiveness of the cycling network, make cycling a safer travel mode, and provide convenient high-quality short-term and long-term bicycle parking facilities at key locations throughout the city.

The draft policies, along with new introductory text and sidebars, will be refined through consultation with external stakeholders and the public scheduled in late 2018 and early 2019. The finalized policies, as part of the Official Plan Review, are expected to be reported to Council in 2019.

2.5 Toronto Road Safety Plan

The Ten Year Cycling Network Implementation Plan proposes new dedicated and connected cycling facilities across the city. The *2017-2021 Road Safety Plan's*[xvii] additional safety enhancement programs will implement improvements to existing cycling routes and facilities using cyclist collision data to identify high risk corridors and intersections.

Improvements and enhancements could include additional pavement markings, signs and bollards and construction of raised or separated cycling facilities. This also includes pilot studies / evaluations of new and emerging designs, applications, countermeasures and technologies for cyclist safety. Dedicated and separated cycling facilities, such as buffered bike lanes, cycle tracks, bike trails, bike boxes, signage and pavement markings, provide greater guidance and protection for cyclists from vehicular traffic than shared and unmarked facilities.

In addition, the Road Safety Plan identifies the following countermeasures which will change the built environment to make Toronto's streets safer for cycling:

- Intersection safety improvements, including as applicable the installation of bicycle crossing signals;
- A pilot study will be conducted on the technological and financial requirements of implementing an advanced green for cyclists at signalized cyclist crossings;
- Reductions to the posted speed limits for those street locations identified in the Road Safety Plan report;
- Speed enforcement measures in construction zones;
- Enhancements to the automated detection of cyclists at high cyclist volume intersections;
- An expansion of speed enforcement measures and the "Watch Your Speed" Program to include the use of permanent speed display signs exclusively in school zones; and
- New enforcement measures to be undertaken by the Toronto Police Service in support of the Road Safety Plan.

2.6 Toronto Complete Streets Guidelines

The City of Toronto developed *Complete Streets Guidelines*[xviii] to provide a holistic approach for how we design our city streets. This builds on many of the City's existing policies, guidelines and recent successful street design and construction projects.

Complete streets are streets that are designed to be safe for all users, such as people who walk, bicycle, take transit or drive, and people of varying ages and levels of ability. They also consider other uses like sidewalk cafés, street furniture, street trees, utilities, and stormwater management.

While not every type of use or user may be accommodated on every street, the goal is to build a city with a well-functioning street network that supports and sustains our quality of life in Toronto. Complete streets will ensure that social, economic and environmental priorities are integrated in street planning and design. For more information on how the *Complete Streets Guidelines* will be used alongside the City of Toronto's Cycling Network Plan, please see Section 10.4.2 of this report.

3 Study Process

The Ten Year Cycling Network Plan study is intended to identify the most meaningful projects for cyclists and 'would-be' cyclists to be scheduled and implemented over the next 5 and 10 years. The cycling projects that the City will implement have to be the "most meaningful" in terms of being located throughout the city; supported by stakeholders and the public; fill gaps; overcome barriers; upgrade existing bikeways when a new type would better serve the users and fit the corridor context; integrate with transit; connect key places with high levels of cycling activity or potential; connect to adjacent municipalities; and fulfill City policies.

The study process consisted of the following major components as illustrated in Exhibit 3-1.

1. Undertake a critical review of the recommended network in the 2001 Toronto Bike Plan with the project team. This review resulted in a draft map of key cycling projects as per the 2001 Toronto Bike Plan plus new opportunities for cycling facilities that warranted further analysis for their impact on cycling, and were presented for stakeholder and public consultation. The process of reviewing the cycling network is documented in **Section 4**;
2. Analyze the impact of the network on cycling, i.e., determine those routes that are the "most meaningful", based on the following criteria:
   - Current cycling demand
   - Potential demand
   - Coverage, i.e. areas of the city that lack bikeways
   - Barriers and opportunities to cross them or improve existing crossings
   - Population and employment density
   - Trip generators
   - Safety
   - Connectivity
   - Higher-priority transit station connections

   These criteria are described in detail and the maps that represent the data are provided in **Section 5** and **Subsections 5.1 to 5.9**;
3. Consult with stakeholders and the public regarding the draft cycling network map to incorporate their opinions and preferences. These consultations are documented in **Section 6**;
4. Undertake a priority analysis of which routes should be implemented each year for the next five and ten years. This consisted of first determining the type of cycling facility feasible for the various cycling routes, and then the associated cost to implement them. Coordination opportunities to implement the cycling routes as part of other municipal projects were also determined. The cycling impact analysis, consultation results and feasibility analysis were combined to determine project priorities. An overall schedule of projects was developed by evaluating coordination opportunities and project priorities. This cycling project priority analysis is documented in **Section 7**; and,
5. Prepare a schedule of projects for each of five scenarios based on various funding levels. Each scenario included funding the implementation of the approved Bikeway Trails Implementation Plan projects; the Ten Year Plan Cycling Network (Connect and Grow projects); the existing network upgrades (Renew projects); and

bicycle parking, i.e. bike racks and bike stations. The funding scenarios are documented in **Section 8**; the Renew program is documented in **Section 9**.

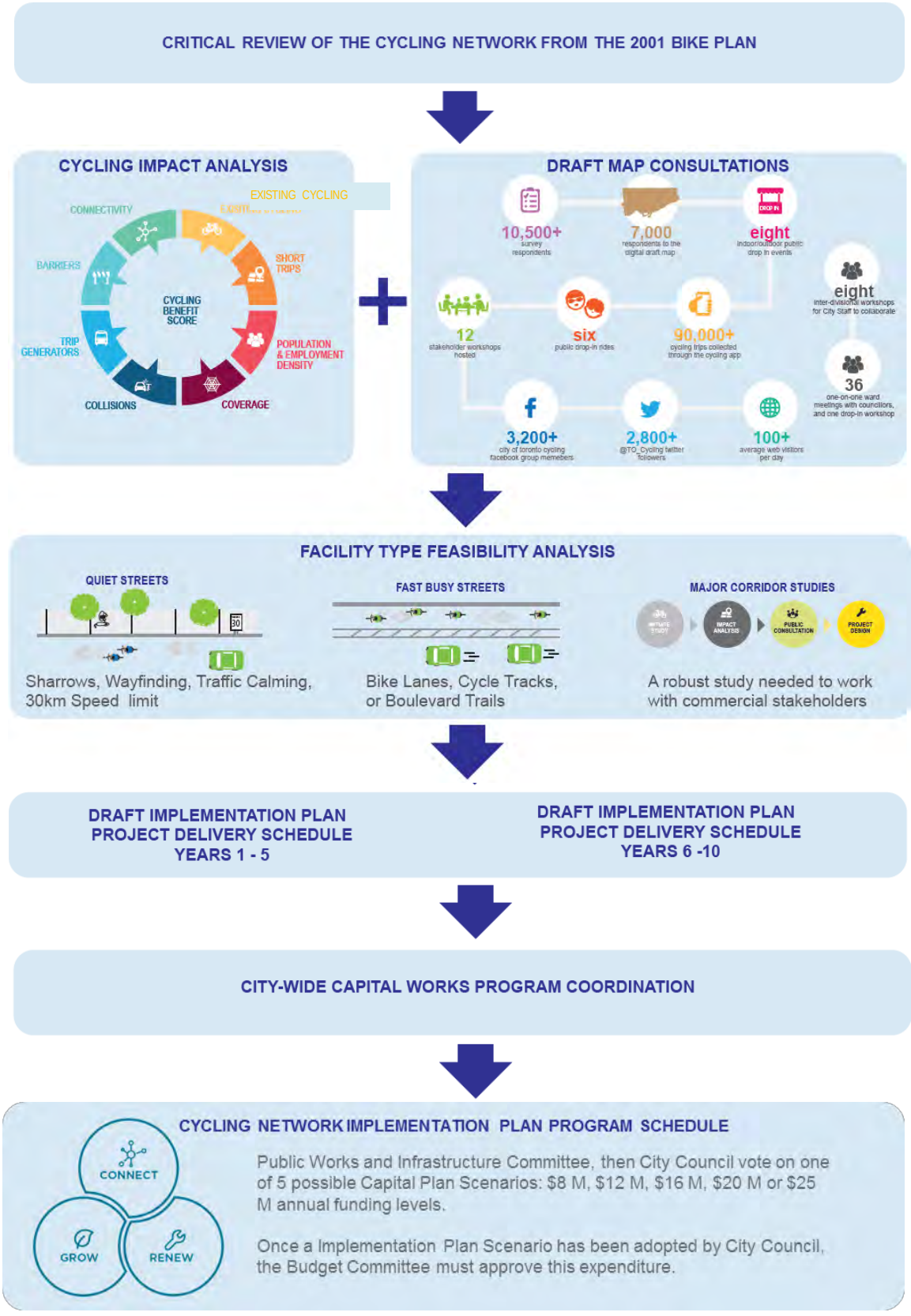
The recommended Ten Year Cycling Network Implementation Plan, including the Bikeway Trails projects; the Ten Year Plan Cycling Network; the existing network upgrades and bicycle parking, is presented in **Section 10**.

Resources to deliver and maintain the Ten Year Cycling Network Plan are discussed in **Section 11**.

Section 12 of the report presents objectives to track and monitor the delivery of the plan.

The recommendations of the report as approved by Council are presented in **Section 13.**

Exhibit 3-1: Ten Year Cycling Network Implementation Plan Study Process



4 Cycling Network Critical Review

The recommended cycling network in the 2001 Bike Plan formed the basis of the network to be reviewed and updated, and then analyzed to develop a ten year implementation plan. Most of the downtown cycling routes recommended in the 2001 Bike Plan have been installed. A key goal of the Ten Year Cycling Network Plan for downtown is to further enhance the existing network by adding new routes and enhancing existing routes. Most of the routes recommended in 2001 for Scarborough, North York and Etobicoke have not been installed. A key goal of the Ten Year Cycling Network Plan in these areas is to learn lessons from the past ten years about what did not work and why, and re-evaluate what can now be done to make these parts of Toronto great places to ride a bike moving forward.

This critical review of the cycling network was undertaken in consultation with a number of stakeholders before being issued as the draft digital map for public review:

- **Transportation Services staff in the Cycling Unit:** These staff are responsible for implementing the cycling network. They provided an understanding of which projects did not move forward and why. Some projects were difficult to achieve technically, others were not supported by the area residents or businesses, and some where tabled in favour of other nearby opportunities or investments that arose. Staff also incorporated ideas from Cycle Toronto that were presented at an event in November 2014, as documented in Section 6.4. Two working meetings with staff were held in March 2015;
- **Ten Year Cycling Network Plan Project Team:** There were nine meetings held with the Project Team from November 2014 to February 2016. Three of these meetings focused on the cycling network review, with minor edits made at subsequent meetings. Staff involved in the Project Team provided information on cycling route and network recommendations from roadway Environmental Assessments, Secondary Plans, Precinct Plans and Avenue Studies. They also provided information on barrier crossings, and rapid transit projects that included cycling facilities; and,
- **District staff:** Four meetings were held, one in each District, in May 2015. Staff marked up maps of the cycling network, revising cycling routes based on traffic operational issues and opportunities, construction co-ordination opportunities, and knowledge of studies and field conditions surrounding specific cycling routes. Additional information on consultation with District staff is provided in Section 6.2.

The draft cycling network map produced from the above consultations was further reviewed during the Phase 2 consultations, as documented in Section 6.6.