



Report to: Development Services Committee

Meeting Date: November 12, 2024

SUBJECT: Cycling Facility Selection Tool (City-wide)
PREPARED BY: Loy Cheah, Senior Manager, Transportation, Ext. 4838
Laura Chong, Project Manager, Transportation, Ext. 3136

RECOMMENDATION:

- 1) That the staff report titled “Cycling Facility Selection Tool (City-wide)” be received; and
- 2) That the Cycling Facility Selection Tool be endorsed; and
- 3) That staff be directed to plan, design and implement in-boulevard multi-use paths or cycle tracks that take into consideration financial, operational and maintenance impacts, available funding and the criteria outlined in the Cycling Facility Selection Tool; and
- 4) That the Director of Engineering, in consultation with the Director of Operations and the City Treasurer, be authorized to update the Cycling Facility Selection Tool from time to time, to accommodate changing needs and practices; and further
- 5) That staff be authorized and directed to do all things necessary to give effect to this resolution.

PURPOSE:

This report seeks Council endorsement of the Cycling Facility Selection Tool. The objective is to ensure the consistent implementation of active transportation infrastructure across the City with respect to the planning, design, and construction of cycling facilities. This report also provides additional information on the operational and maintenance financial impacts of these active transportation facilities.

BACKGROUND:

A facility selection tool was developed as part of the Active Transportation Master Plan (ATMP)

The Cycling Facility Selection Tool was developed and finalized in February 2022 to support the City’s Active Transportation Master Plan and has been updated to reflect the changes identified in the new Ontario Traffic Manual (OTM) Book 18. This facility selection tool provides guidance and direction to staff and consultants on the selection of active transportation facilities that:

- Provides consistency across the City of Markham's active transportation network;

-
- Protects the safety of active transportation network users in accordance with industry guidelines and best practices;
 - Utilizes existing active transportation infrastructure to its maximum potential;
 - Expands the high-quality network of protected cycling facilities and paths/trails to form part of an all ages and abilities (AAA) City-wide network.

Implementation of active transportation facilities are on-going

On May 30, 2022, Council received a staff report entitled “[Active Transportation Master Plan Implementation Strategy and Capital Plan](#)”. Council endorsed the implementation plan and prioritization process for the ATMP 10-year cycling capital plan, which is to be phased in appropriately during the program term. Implementation of the 10-year capital plan projects are subject to the annual budget approval process.

Since the endorsement of the Active Transportation Master Plan 10-year Implementation Strategy in 2022, seven (7) of the first 5-year cycling capital plan projects will be undergoing detailed design this year and are anticipated to be constructed in 2025. It is critical that a consistent facility selection procedure be used as more active transportation facilities are being planned and implemented, including on-road and in-boulevard cycling facilities.

Also note that separate from the ATMP, on-going approvals of development plans in secondary plan areas such as in the Future Urban Area, Cornell Centre, Markham Centre and Markham Road-Mount Joy, includes in-boulevard cycling facilities that are being constructed as part of the approved development plans.

OPTIONS/ DISCUSSION:

The Cycling Facility Selection Tool is based on the Ontario Traffic Manual (OTM) Book 18 guidelines

The cycling facility selection tool is illustrated in Attachment ‘A’. This selection tool was developed following the higher-level guidance of the OTM Book 18, the industry guidelines in Ontario. As such, considerations for separated cycling facilities are based on vehicular speed on the adjacent roadway, the number of lanes on the roadway, and annual average daily traffic.

Four different cycling facilities can be identified through the Cycling Facility Selection Tool

The Facility Selection Tool guides practitioners to identify the cycling facility most appropriate for the road context of the project based on the criteria of vehicular speed, number of motor vehicle lanes, and annual average daily traffic. One of four different cycling facilities can result, including:

- shared or designated cycling facility (conventional on-road bike lane);
- protected bike lane (on-road bike lane with a buffer zone);
- cycle tracks (in-boulevard separated cycling facility);
- multi-use paths (in-boulevard MUP).

An example of each of these separated cycling facilities are shown in Attachment ‘B’.

Cycle tracks provide the highest level of protection and are appropriate when the roadway context include frequent high-volume driveways, high anticipated cycling or pedestrian demand and signalized intersections with high-volume turning conflicts.

MUPs are selected where the roadway context includes back-lotted land uses, infrequent high-volume driveways, low-anticipated cycling or pedestrian demand and low-volume turning conflicts.

Selection of the appropriate cycling facility requires professional judgement

The cycling facility selection tool provides a framework and guidance to practitioners on the selection of various separated cycling facilities that are context sensitive. However, this tool is not intended to be a substitute for professional judgement. There is flexibility inherent in the OTM Book 18 guidance, and project conditions may justify selecting a cycling facility that is different than what is indicated by the facility selection tool, considering the existing cycling accommodation, location, and network context of the project to protect the safety of all road users.

For instance, where existing conditions are such that right-of-way widths are constrained or the project is a small gap in the cycling network, professional judgement may lead practitioners to:

1. Limit facility type options available for consideration;
2. Eliminate on-street facility types from consideration;
3. Select a lower facility type and still provide an improvement in safety over existing conditions; or
4. Consider an alternate local street connection that provides a parallel route option.

Operations and maintenance (O&M) costs for separated cycling facilities are different depending on the required level of winter maintenance

Separated cycling facilities require different levels of maintenance during winter months depending on the type of facility and its design.

The *Ontario Regulation 239/02: Minimum Maintenance Standards for Municipal Highways (MMS)* under the Municipal Act provides minimum maintenance requirements for “bicycle lanes”, which includes conventional bike lanes, buffered bike lanes, and protected bike lanes (which are separated from the adjacent traffic lane by a physical device). In particular, on-road cycling facilities such as conventional bike lanes and buffered bike lanes are typically maintained at the same time in the winter as the adjacent traffic lanes for efficiency reasons, and therefore, their maintenance levels are defined and maintenance costs are reduced significantly. However, protected bike lanes must be maintained separately from the adjacent traffic lanes due to the protection of a physical device, which can be planters, concrete medians, parking stops, or bollards.

Other types of separated cycling facilities such as in-boulevard cycle tracks and in-boulevard multi-use paths and their required level of winter maintenance are not defined in Provincial regulations yet. Accordingly, different municipalities currently have different maintenance levels for these in-boulevard facilities. For instance, some

municipalities have chosen to not maintain some or all of their cycle tracks during winter months.

O&M costs for cycle tracks are much higher than the costs for MUPs

Annual O&M unit costs for cycle tracks and MUPs have been developed based on the winter maintenance requirements for separated cycling facilities as defined in the MMS for municipal highways and guidelines in OTM Book 18. The cycle tracks referenced below are part of the ATMP priority cycling network. Based on OTM Book 18 guidance, they are to be maintained to the same standard as Class 1 highways in accordance with the MMS, and the O&M costs reflects that maintenance standard. MUPs are maintained to the same level as sidewalks per the MMS.

As they are all tax-funded, of significance are the O&M costs of in-boulevard cycling facilities (cycle tracks and multi-use paths), which have the highest O&M costs among the different types of cycling facilities. The annual O&M unit costs and total ATMP 10-Year Implementation Plan (plus approved development plans) costs for the in-boulevard cycling facilities are shown respectively in Tables 1 and 2 below.

Table 1: In-Boulevard Cycling Facility Operations & Maintenance (O&M) Unit Costs
(Source: City of Markham Operations)

Cycling Facility	Annual O&M Unit Cost (\$/km)
Sidewalks (1.5m concrete)	\$12,160
Multi-Use Paths (3m concrete)	\$24,320
Cycle Tracks (1.5m concrete)*	\$67,760

*Does not include snow load and haul, and cost is for both sides of road

Table 2: ATMP 10-Year Plan + Approved Development Plans – In-Boulevard Cycling Facility O&M Network Costs

Cycling Facility	Total Network Length (km)	Annual O&M Based on Facility Selection Tool (\$)	Annual O&M if Cycle Track is Selected (\$)
Multi-Use Paths (3m concrete)	110.4	\$ 2.68M	\$ 10.17M**
Cycle Tracks + Sidewalks	20.7	\$ 1.91M	\$1.91M
TOTAL	131.1	\$4.59M	\$12.08M

** includes O&M cost of sidewalks when MUPs are converted to separated cycle tracks and sidewalks.

On a network basis, as shown in Table 2, if cycle tracks are preferred instead of MUPs that are identified through the selection tool, the annual O&M cost increases significantly.

Thus, it is important that the facility selection tool be endorsed and used consistently to inform the selection of cycling facilities to minimize the financial impact on future maintenance requirements.

Future updates of the Facility Selection Tool will be necessary to stay abreast of changing transportation technologies, safety needs, and policies on active transportation

Increasingly, users of various micro-mobility devices (personal electric devices with one, two, three, or four wheels) are using the cycling network (and sidewalks) for their trips. The City will be developing a micro-mobility strategy as part of the upcoming Markham Transportation Master Plan (MTMP) study that will examine how micro-mobility devices are to be accommodated on the cycling and trails network. As well, bicycle technology is also changing, and design guidelines will need to change in step with these technological changes to maintain the safety of all facility users.

Therefore, it is recommended that the Director of Engineering be given authorization to update the approved Cycling Facility Selection Tool from time to time in consultation with the Director of Operations and City Treasurer as needs and industry guidelines change.

FINANCIAL CONSIDERATIONS

This report has no financial impact to the Operating Budget or Life Cycle Reserve. The future financial impacts of individual transportation projects, including the capital and operating and maintenance costs of the cycling components, will be identified and fully assessed during the Capital Budget and Operating Budget process.

HUMAN RESOURCES CONSIDERATIONS

Not applicable.

ALIGNMENT WITH STRATEGIC PRIORITIES:

The ATMP Facility Selection Tool aligns with the City's Strategic goal of building Safe, Sustainable, and Complete Communities by improving and making active transportation a safe and sustainable mobility option.

BUSINESS UNITS CONSULTED AND AFFECTED:

Operations, Finance, and Legal Departments were consulted on the report.

RECOMMENDED BY:

Frank Clarizio, P.Eng.
Director of Engineering

Arvin Prasad, MPA, RPP, MCIP
Commissioner of Development Services

ATTACHMENTS:

“A” – Cycling Facility Selection Tool

“B” – Examples of separated cycling facilities