

New Cycling Design Guidelines for Ontario

Peel Region | February 26, 2015



Dave McLaughlin, Partner



Overview

- Highlights from OTM Book 18
- MTO Bikeways Design Manual
- Bicycle Facility Maintenance Considerations

► OTM Book 18: Background


Purpose of Book 18:

To provide practical guidance on the planning, design and operation of cycling facilities in Ontario.



Download it for free:

<http://www.mto.gov.on.ca/english/transrd/>

- Click on 'Library Catalogue'
- Enter "Ontario Traffic Manual Book 18"
- Click on the 
- Select:
cwug - OTM_Book_18_March_2014[1].pdf



Network planning considerations



**User
characteristics**



Facility types



**Route selection
criteria**

► Facility Types

Generally Lower
Volume, Lower Speed
Less Facility Separation



Generally Higher Volume,
Higher Speed
Greater Facility Separation

SHARED SPACE



DESIGNATED SPACE



SEPARATED FACILITIES





Facility Selection Tool

OTM 18
SECTION
3.2

STEP 1:

Pre-Select Facility Type using the Nomograph

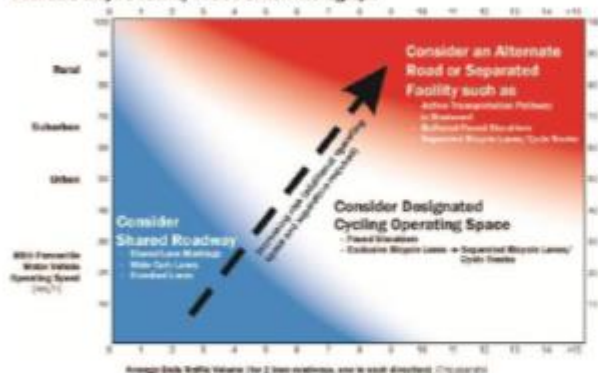
STEP 2:

Examine Other Factors & Select Appropriate Facility Type

STEP 3:

Justify Final Decision & Identify Potential Design Enhancements

STEP 1 of 3
Desirable Bicycle Facility Pre-selection Nomograph





Facility Selection Tool: Step #1

OTM 18
SECTION
3.2

STEP 1:

**Pre-Select Facility
Type using the
Nomograph**



STEP 2:

**Examine Other
Factors & Select
Appropriate Facility
Type**



STEP 3:

**Justify Final Decision
& Identify Potential
Design
Enhancements**

- Collect and review existing and future AADT volumes and 85th percentile motor vehicle operating speeds
- Plot on nomograph
- Identify bicycle facility options in terms of shared space, designated space, or a separated facility

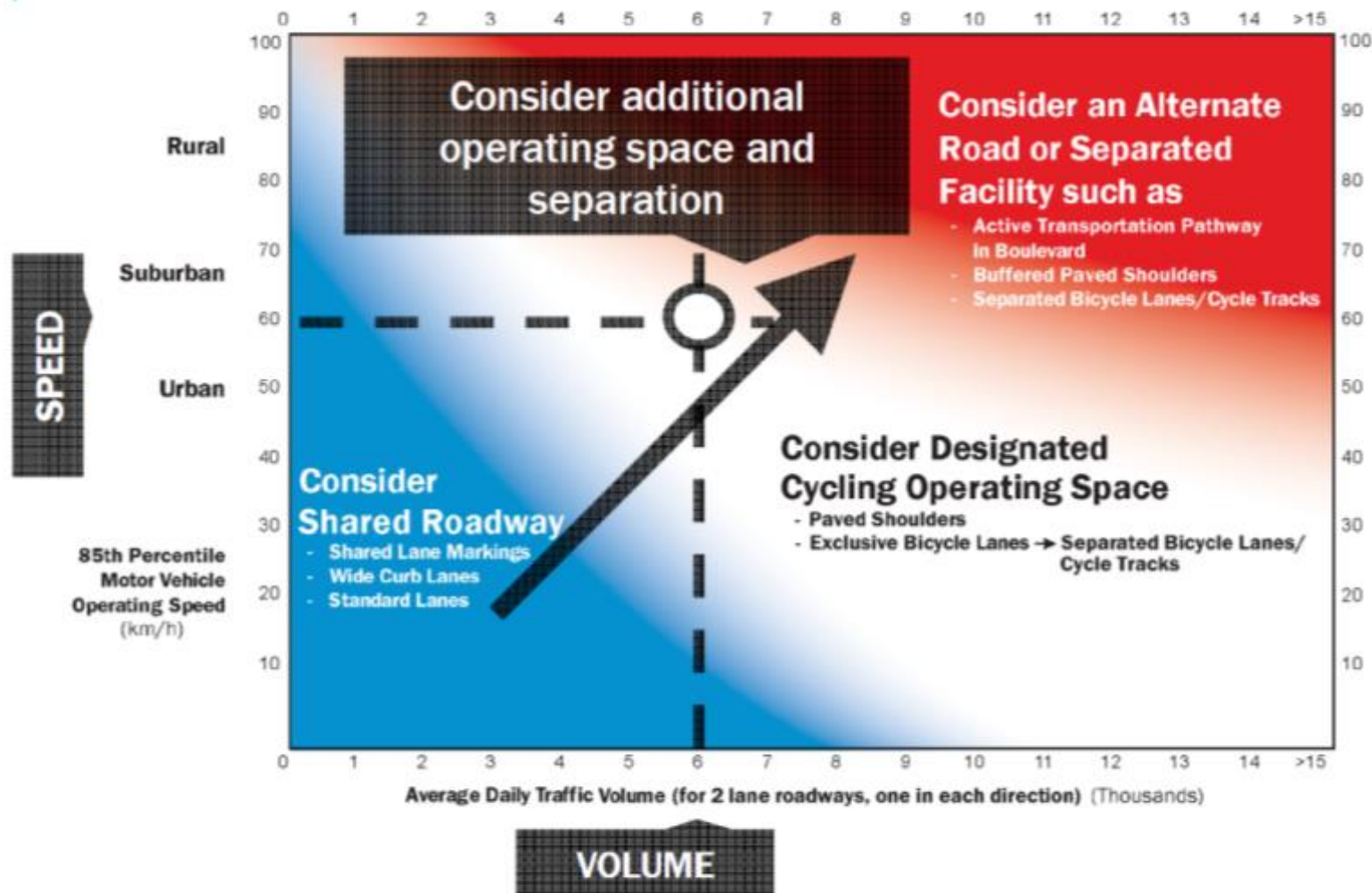
► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 7



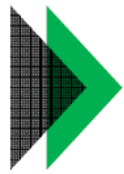
Facility Selection Tool: Step #1

OTM 18
SECTION
3.2



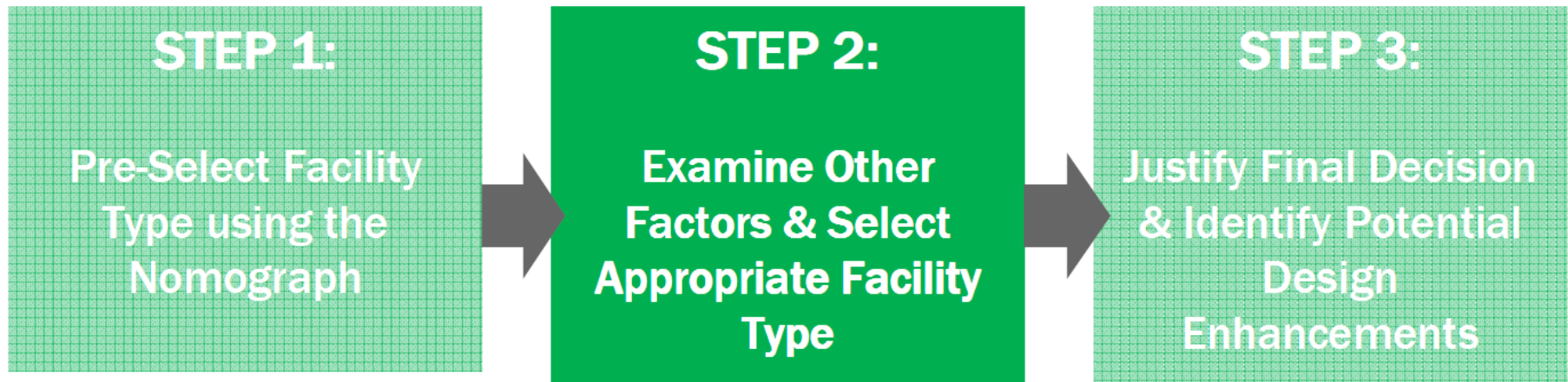
► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 8



Facility Selection Tool: Step #2

OTM 18
SECTION
3.2



- Inventory site conditions
- Review key design considerations and application heuristics
- Select appropriate and feasible bicycle facility type

► **Bicycle Facilities and Municipal Liability Workshop**



Facility Selection Tool: Step #3

OTM 18
SECTION
3.2

STEP 1:

Pre-Select Facility
Type using the
Nomograph

STEP 2:

Examine Other
Factors & Select
Appropriate Facility
Type

STEP 3:

Justify Final Decision
& Identify Potential
Design
Enhancements

Exercise sound engineering
judgement

- Justify decision and describe changes (if any) between results from Steps 1 and 2
- Identify design enhancements
- Document rationale and principles used to make recommendations

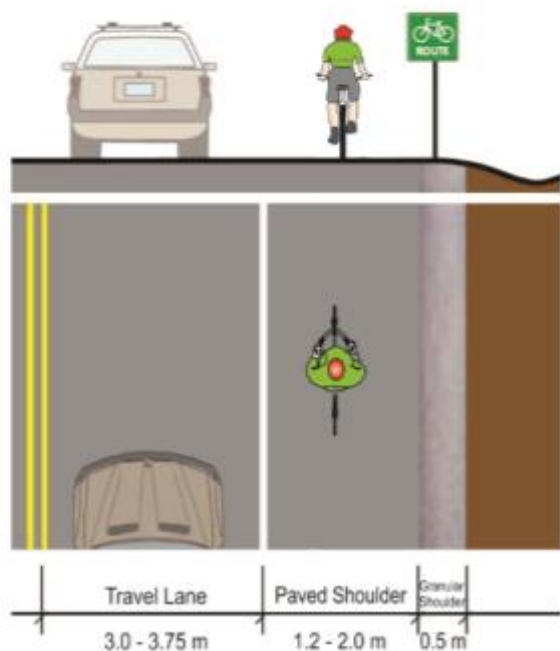
► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 10

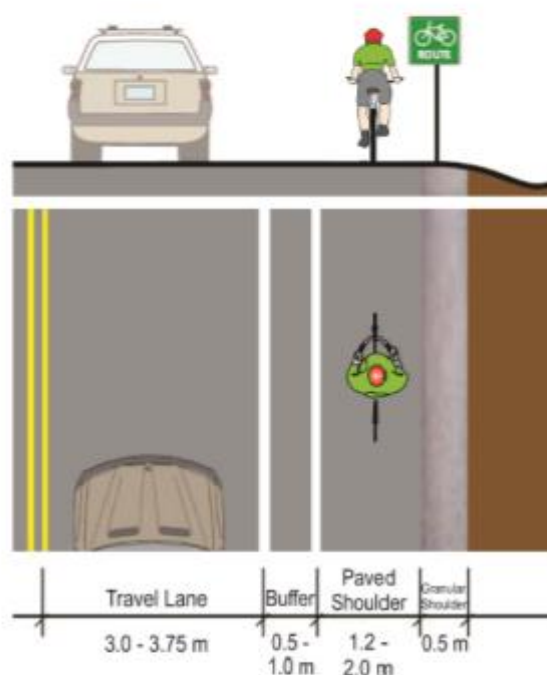
Paved Shoulder

OTM 18
SECTION
4.1

Signed Bike Route with
Paved Shoulder



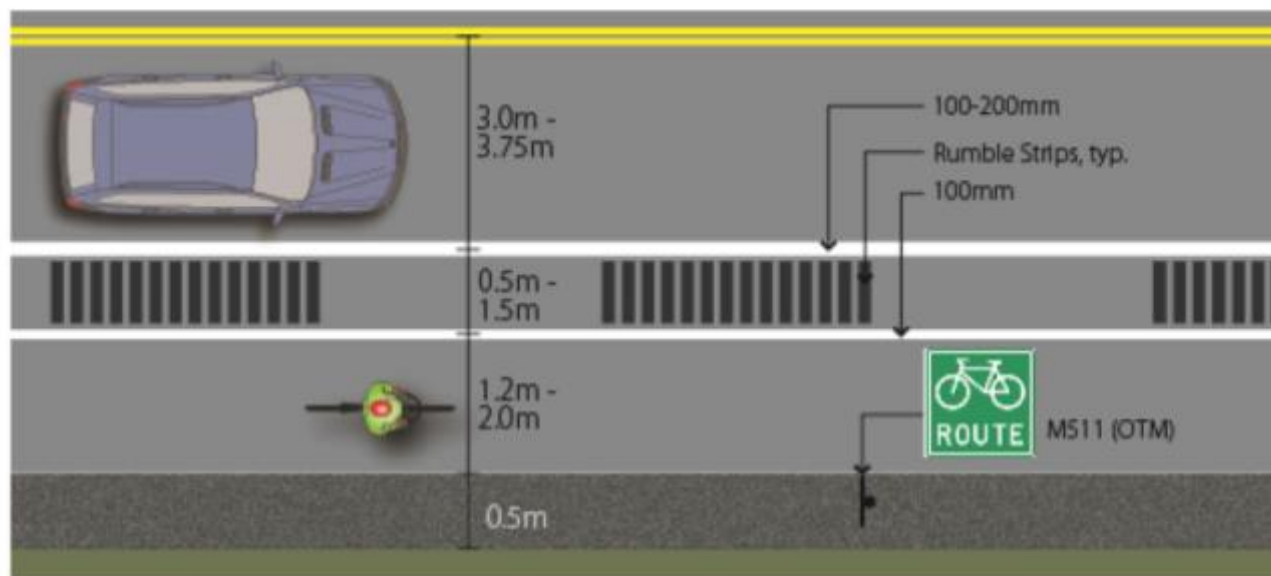
Signed Bike Route with
Buffered Paved Shoulder



Optional
hatching
in the
buffer

▶ Paved Shoulder

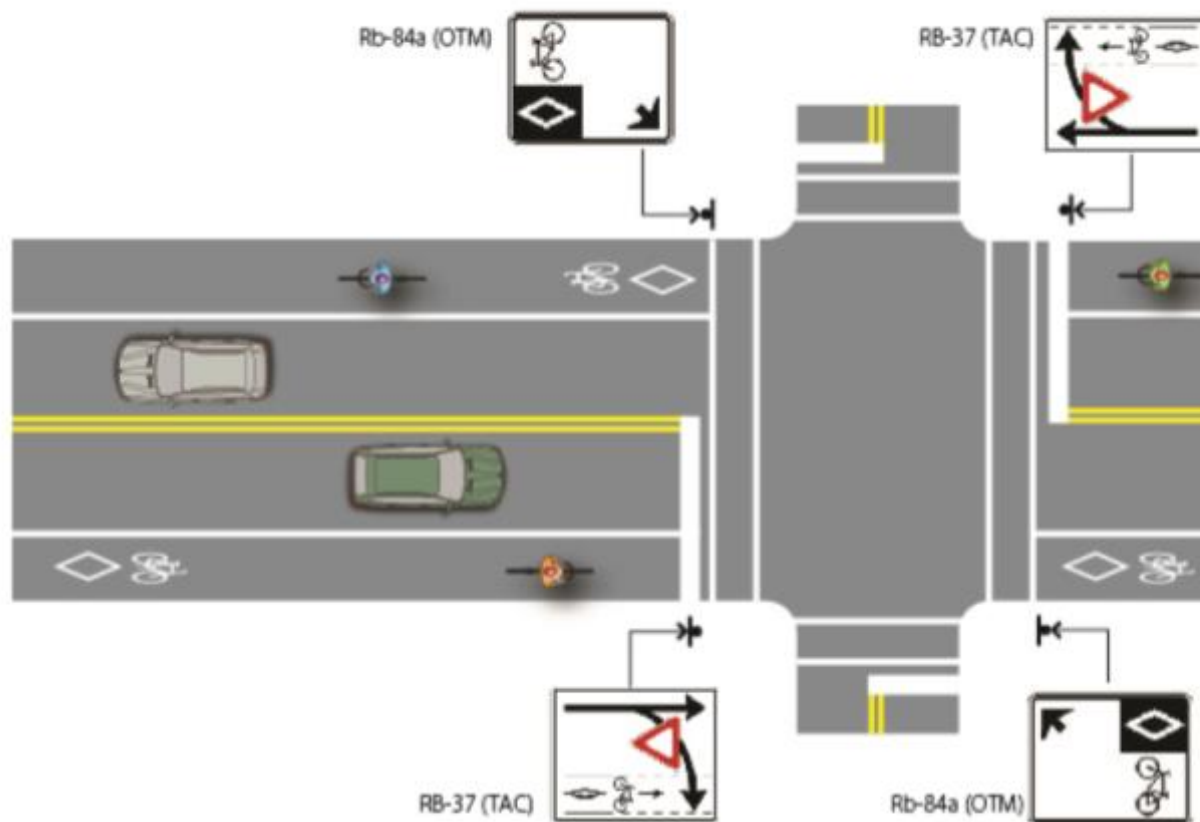
- *Bicycle friendly rumble strips use a skip pattern, which allows cyclists to manoeuvre onto the roadway if necessary*



Bicycle Lanes

OTM 18
SECTION
4.2

Solid line can
be carried
through to
intersection

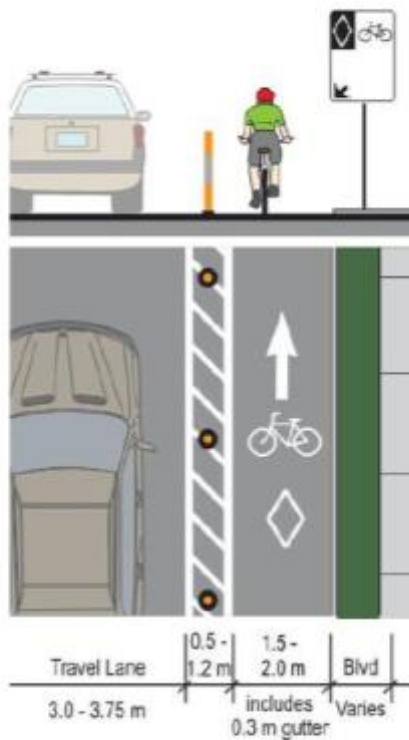




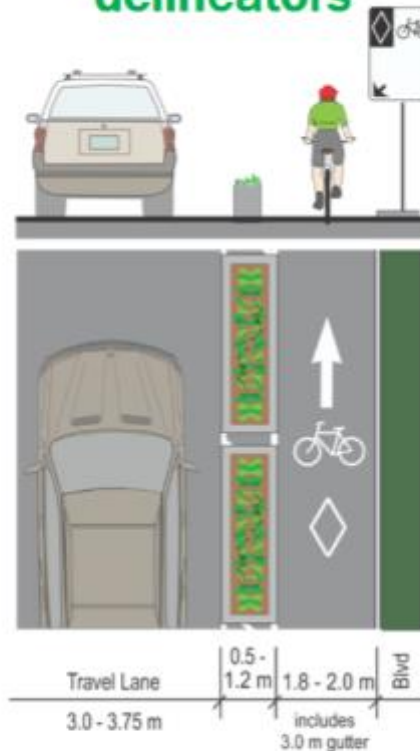
Separated Bicycle Lanes

OTM 18
SECTION
4.2

with Flex Bollards



with Planters or other physical delineators



with On-Street Parking



Buffered and Separated Bicycle Lanes



Left: Hwy 7, York Region;
Right: Laurier Separated Bicycle Lane, Ottawa;
Bottom: Sherbrook St, Winnipeg



► Physical Delineators



Left: Laurier Separated Bicycle Lane, Ottawa;
Centre and Right: Cannon Street, Hamilton



Raised Cycle Tracks

OTM 18
SECTION
4.3

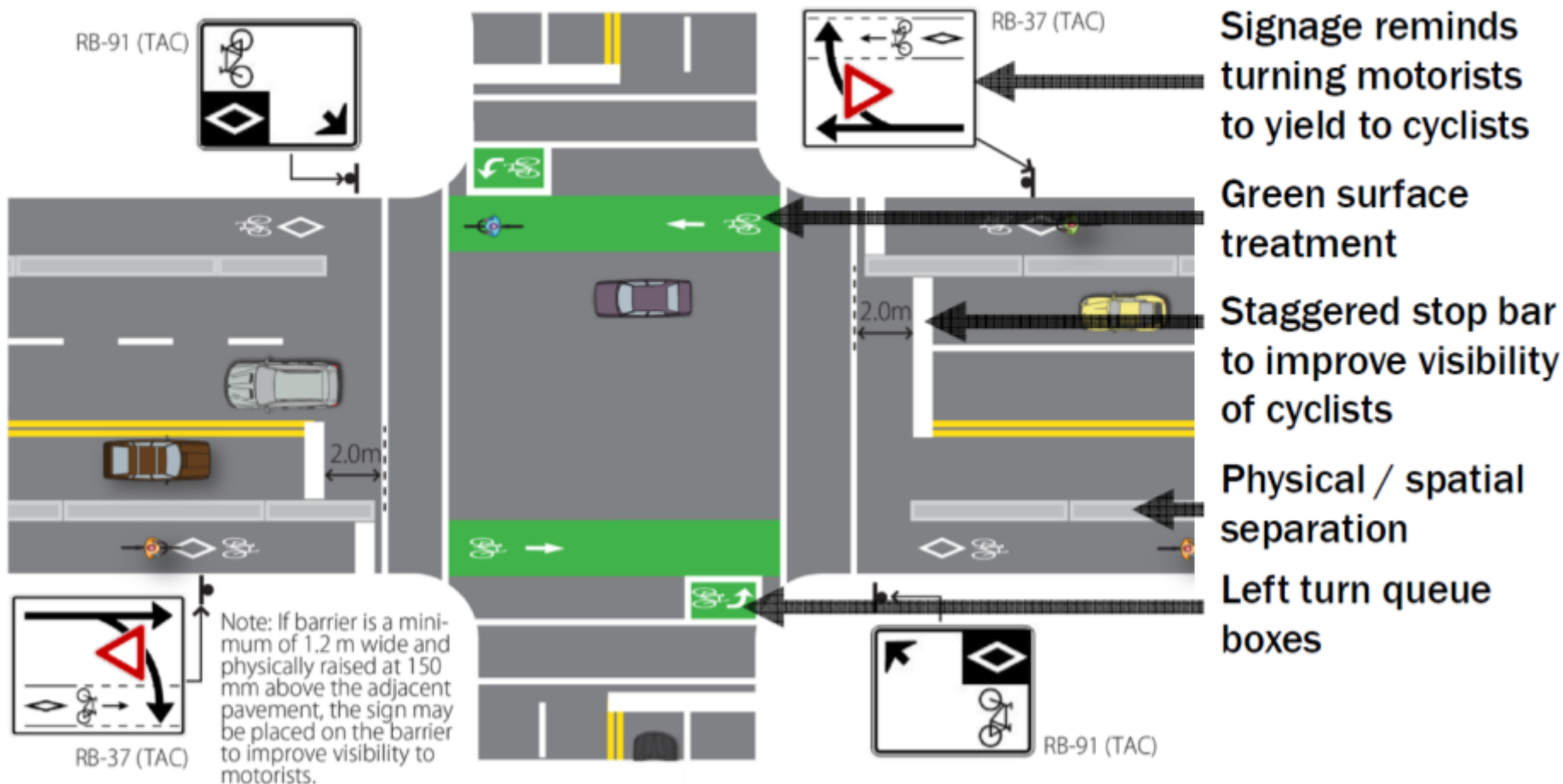


Left: Sherbourne St, Toronto;
Right: Stone Rd, Guelph



Optional Intersection Treatments

OTM 18
SECTION
4.2



► Intersection Treatments



Left turn queue box and intersection pavement markings on the Laurier Bikeway in Ottawa.



Sherbourne Street in Toronto – chevrons are used to mark the facility through the intersection.



Intersection Treatments

OTM 18
SECTION
4.2



Hwy 7 at East Beaver Creek features a left turn queue box in the boulevard

► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 20

Crosswalks

OTM 18
SECTION
4.4

- pedestrian facility
- cyclists **CANNOT** legally cross without dismounting

- Cyclists **CAN** legally cross without dismounting
- Pavement markings and signage alert drivers to look for cyclists

Crossrides

OTM 18
SECTION
4.4



Airport Road and Caledon Trailway in Caledon

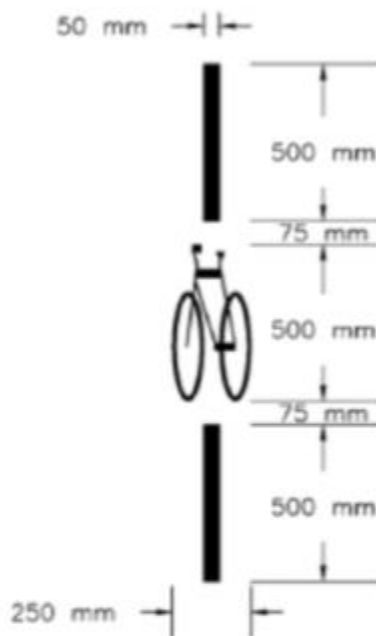
► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 23



Cyclist Detection / Signals

OTM 18
SECTION
5.8



Active detection /
pushbutton sign

Passive detection /
loop detector
pavement marking

Bicycle signal head
(TAC Recommended;
approval pending in
Ontario)

► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 24

▶ Transit Stops

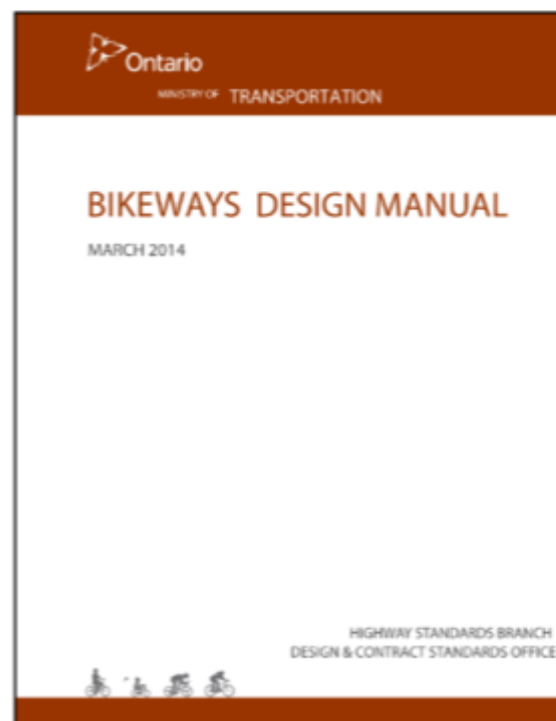


Left: Sherbourne Street, Toronto;

Right: Pembina Hwy, Winnipeg

MTO Bikeways Design Manual

- Approved in March 2014
- Includes provisions for trails within the MTO right-of-way
- Includes pavement marking, signage and geometric design guidelines for both on- and off-road facilities
- Developed in conjunction with OTM Book 18
- Intended as a bikeway geometric design resource for MTO highway designers



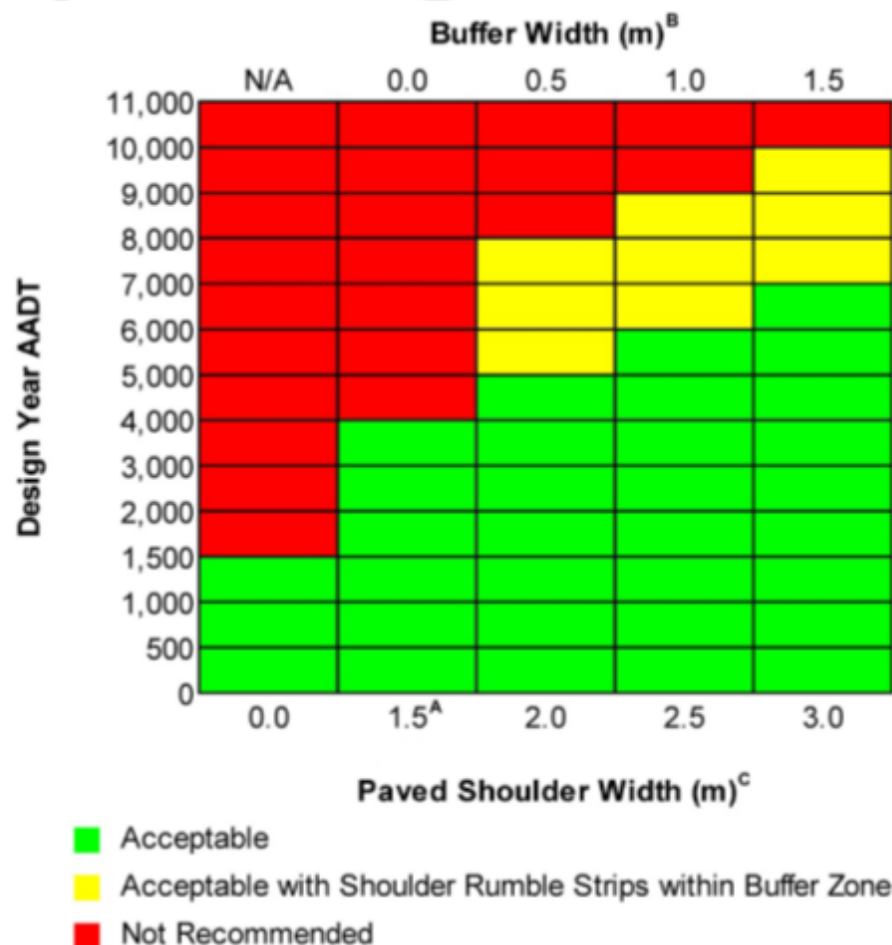
Bicycle Facilities and Municipal Liability Workshop

 Region of Peel | February 26, 2015 | 26



MTO Bikeways Design Manual

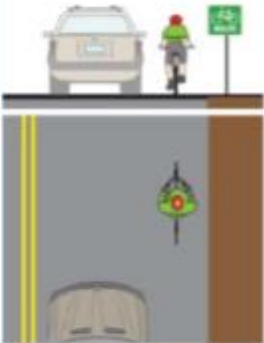
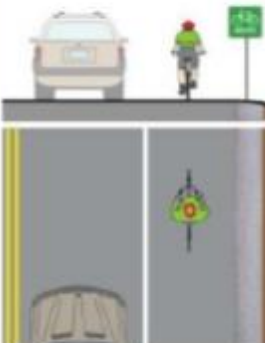




- Tool to assist MTO in selecting paved shoulder type to accommodate cycling on Secondary Highways
- Design year AADT is the primary factor










MTO Bikeways Design Manual

ON-ROAD FACILITIES:

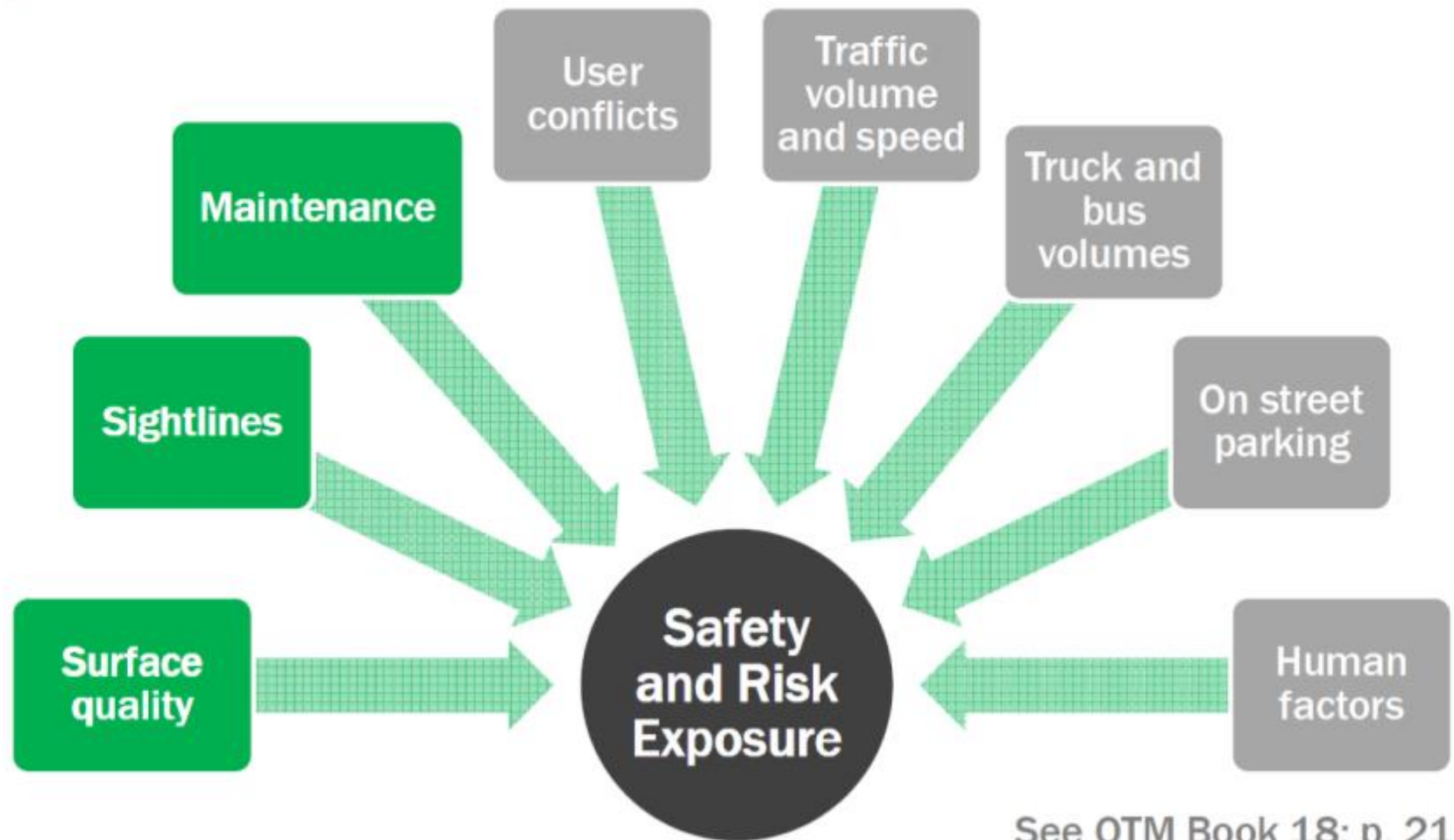
	Signed Bike Route ¹	Signed Bike Route with a Paved Shoulder	Signed Bike Route with a Buffered Paved Shoulder	Bicycle Lane	Separated Bicycle Lane	Raised Cycle Track
Example Cross Section						
	Example of Narrow Signed Bike Route on a Rural Cross-Section	Example of a Signed Bike Route with a Paved Shoulder	Example of a Signed Bike Route with a Paved Shoulder including Buffer	Example of a Conventional Bicycle Lane	Example of Buffered Bicycle Lane	Example of a One-Way Raised Cycle Track
Width	4.0 – 4.5 m (Shared travel lane)	1.2 – 1.5 m (Paved Shoulder only)	2.0 – 3.0 m (Paved Shoulder with 0.5 – 1.5 m buffer)	1.5 – 1.8 m (Bicycle Lane & gutter)	1.5 – 2.0 m (Bicycle Lane & gutter) 0.5 – 1.2 m (Separation width)	1.5 – 2.0 m (One-way Cycle Track) 3.0 – 4.0 m (Two-way Cycle Track)

MTO Bikeways Design Manual

OFF-ROAD FACILITIES:

	One-Way Active Transportation Path with Sidewalk	Two-Way Active Transportation Path with Sidewalk	Shared Use Active Transportation Path	Two-Way In-Boulevard AT Path	Off-Road Multi-Use Trail
Example Cross-Section	 <p>Example of One-Way AT Path</p>	 <p>Example of Two-Way AT Path with Sidewalk</p>	 <p>Example of Shared Use AT Path</p>	 <p>Example of Two-Way In-Boulevard AT Path</p>	 <p>Example of Multi-Use Trail</p>
Lane	1.8 – 2.0 m (Bicycle Path Width Only)	3.0 – 4.0 m (Bicycle Path Width Only)	3.0 – 4.0 m (Shared Use Path Width)	3.0 – 4.0 m (Shared Use Path Width)	3.0 – 4.0 m (Trail Width)

► Why do maintenance?



► Maintenance Tasks

- Sweeping
- Surface repair
- Vegetation
- Signage and pavement markings
- Drainage
- Winter maintenance



OTM Suggestions:

- *Clear sand and debris in early spring*
- *Perform regular sweeping and adjust schedule as needed*
- *Avoid sweeping debris from roadway onto cycling path*
- *Incorporate visual monitoring of cycling facilities into existing road patrols*

► Maintenance Tasks

- Sweeping
- Surface repair
- Vegetation
- Signage and pavement markings
- Drainage
- Winter maintenance



OTM Suggestions:

- *Evaluate risk to cyclists from surface defects*
- *Seal cracks and patch potholes in accordance with the timelines outlined in the local road authority quality standard*
- *Consider resurfacing schedule*
- *Implement temporary measures such as hazard markers, if warranted*
- *Ensure that gravel adjacent to paved surface is well compacted and flush with asphalt during resurfacing*

► Maintenance Tasks

- Sweeping
- Surface repair
- **Vegetation**
- Signage and pavement markings
- Drainage
- Winter maintenance



OTM Suggestions:

- *Install vertical steel plates or other root barriers*
- *Remove or cut back vegetation that is encroaching on the facility or blocking sightlines or signage*
- *Prioritize removal of obstructions near roadway intersections / trail crossings*

► Maintenance Tasks

- Sweeping
- Surface repair
- Vegetation
- Signage and pavement markings
- Drainage
- Winter maintenance



OTM Suggestions:

- *Apply pavement markings as soon as possible after paving*
- *Include signage and pavement markings in regular roadway inspections*
- *Maintain sign inventory, and replace if faded, damaged, stolen*
- *Regularly refresh pavement markings*

► Maintenance Tasks

- Sweeping
- Surface repair
- Vegetation
- Signage and pavement markings
- **Drainage**
- Winter maintenance



OTM Suggestions:

- *Ensure catch basins are free of debris*
- *Inspect drainage of adjacent lanes simultaneously*
- *Ensure adequate cross slopes during design, construction and rehabilitation*

► Winter Maintenance

- Many people walk and cycle year round
 - *Improved maintenance may encourage more year round walking and cycling*
- Snow and ice are not only difficult to ride on, but may also obscure travel path, pavement markings, and pavement defects
- Level of appropriate maintenance depends on facility type



► Winter Maintenance



Richmond Street, Toronto, January 2015

► **Bicycle Facilities and Municipal Liability Workshop**

► Region of Peel | February 26, 2015 | 37



Winter Maintenance

Bicycle Lanes and Cycle Tracks:

“For bike lanes and cycle tracks, it is not acceptable to simply install ‘No Winter Maintenance’ signs, so practitioners should consider liability issues. As such, snow clearing operations should include all designated bicycle facilities on or adjacent to the roadway”

-OTM Book 18 p. 189

Winter Maintenance

Bicycle Facilities and OTM Book 18 Suggestions:

- *Clear on-road facilities at the same time as motor vehicle lanes*
- *Treat icy conditions in accordance with the timelines outlined in the local road authority quality standard*
- *Use small articulated tractors for physically separated lanes*
- *Reduce or remove snowbanks where they interfere with sightlines and travel widths*
- *Use abrasives and de-icing agents judiciously; sweep abrasives in accordance with timelines outlined in the local road authority quality standard*
- *Clear snow from bike parking areas*
- *Clear snow on crossrides*
- *Ensure snow melt drains away from cycling facilities to prevent ice formation*



Thank You

- J. David McLaughlin, MCIP, RPP
Partner, MMM Group Limited
905-882-7306
mclaughlind@mmm.ca
<http://mmmgrouplimited.com>