

## MINUTES OF MEETING – City of Cambridge Meeting No. 3

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPAP
<b>OBJECTIVE</b>	To review potential alignments and preliminary screening assessment for the south Cambridge area.
<b>DATE / TIME</b>	September 30, 2015 @ 10:00am
<b>LOCATION</b>	Historic City Hall, Cambridge Room
<b>PROJECT No.</b>	151-07859-00
<b>FILE</b>	

Attendees		E-mail	Phone Number
Paul Smithson	City	<a href="mailto:smithsonp@cambridge.ca">smithsonp@cambridge.ca</a>	519-621-0740 x4575
Brooke Lambert	City	<a href="mailto:lambertb@cambridge.ca">lambertb@cambridge.ca</a>	519-621-0740 x4711
Paula Sawicki	RMW	<a href="mailto:psawicki@regionofwaterloo.ca">psawicki@regionofwaterloo.ca</a>	519-575-4035
Matthew O’Neil	RMW	<a href="mailto:moneil@regionofwaterloo.ca">moneil@regionofwaterloo.ca</a>	519-575-4757 x3462
Harold Sich	WSP	<a href="mailto:hsich@pbworld.com">hsich@pbworld.com</a>	416-640-5456
Mina Dezyanian	WSP	<a href="mailto:mdezyanian@pbworld.com">mdezyanian@pbworld.com</a>	416-644-0625

Item No.	Discussion	Action By
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**1.0 Purpose of Meeting**

WSP outlined the purpose of the meeting as to:

- focus on the southern terminus
- discuss north Cambridge area alignments

WSP provided a brief overview of Region of Waterloo’s planning team’s concern with the East Side Land’s future development plans wrt Maple Grove / Speedsville alignment

**2.0 Northern Cambridge**

WSP provided an overview of the endorsed alignment along Eagle St going through Preston:

- originally it is planned to move the CP tracks along the weir and locate the LRT line between CP tracks and King St
- WSP is proposing placing a retaining wall (that s also a noise barrier) on both sides of the endorsed LRT to create an isolated LRT corridor; when reaching the CP track crossings, instead of going 10m above the heavy rail, the LRT will tunnel under ground
- WSP and City of Cambridge understand that this option will have environmental effects on the Speed River, CP impacts, and property requirement impacts along Eagle St; WSP suggested proving a board walk to the Speed River as mitigation of negative effects (engineering solutions for water control to be discussed in detail)
- City of Cambridge indicated redevelopment on the south-west corner of Eagle and King

**City to send redevelopment**

- Both WSP and the City agree a strong bus feeder network is required to service the town of Preston

plans

WSP also provided an alternative alignment solution along Shantz Hill / King:

- RMW and WSP agreed everything within the environmentally sensitive land should be above grade
- WSP mentioned with the minimum turning radius of LRT to be 25m, the space is limited and will require property
- WSP indicated the importance of truck traffic and access roads (right/left turns) within the area
- The City, RMW, and WSP understood the importance of space needed for storage and maintenance facilities for LRT

WSP stated the convenience of the Maple Grove alignment serving Hespeler better with a strong bus network; with perhaps a connection to the airport

### 3.0 Southern Cambridge

GO1 – LRT single Track Loop Option

- WSP presented a roll plan of LRT, traffic, bike lanes, and parking along Water and Ainslie with bus stop and sidewalk widening potential
- The issue of traffic making unsignalized turn on LRT tracks was mentioned; WSP indicated having safety as a criteria in the screening process of alternative alignments
- WSP mentioned GRT's option of having the LRT along Grand River and loop onto Water; this will need mixed traffic roads causing increase in unreliability within the LRT system with an advanced signal control system
- WSP and the City agreed to loop further south along Concession St

WSP update  
drawing

GO1 – LRT double track option along Water

- WSP presented a roll plan of LRT along Water indicating loss of parking and traffic lanes
- The City and WSP agreed on continuing further along Concession St, leaving Ainslie unchanged

GO2 – LRT along Beverly

- WSP presented an alignment along the centre of Beverly with an issue at the intersection of Main and Wellington to get to Ainslie Terminal
- The City indicated moving Ainslie Terminal to the intersection of Beverly and Wellington to resolve the issue of bringing the LRT down to Ainslie Terminal
- RMW favours GO2 option over GO1 as more flexibility is available for Metrolinx to determine a GO station location

WSP update  
drawing

GO3 – LRT along Beverly with GO stacked on top

- A mobility hub within the downtown core is feasible according to the City as the required property is available

GO 2 – LRT along Dundas

- WSP presented a roll plan of an LRT crossing the CP bridge along Dundas and turning on to Beverly

- WSP specified the requirement of properties east of Dundas due to lane widening in order to keep traffic lanes; WSP also indicated the protection of the school and traffic analysis of intersections with signalization; the City concurred

#### **6.0 Data Collection**

WSP is in the process of obtaining data from the Region

#### **7.0 Other Items**

RMW indicated a desire to move forward with a stakeholder technical advisory committee to facilitate multiple and divergent inputs into the study

#### **8.0 Next Meeting**

Next meeting with City to be held before the November PCC No. 1 (perhaps with the planning team from the Region) in mid-October

## MEETING NOTES – Region of Waterloo Planning and City of Cambridge Planning Meeting

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPA Process
<b>OBJECTIVE</b>	To discuss the evaluation results of N2 and N3; show updated evaluation results after the Technical and Senior Management meetings; obtain consensus on existing and future planning policy interpretation.
<b>DATE / TIME</b>	June 28, 2016 @ 1:30pm
<b>LOCATION</b>	100 Maple Grove Rd, Boardroom
<b>PROJECT No.</b>	161-07859-00

Attendees	Organization	e-mail
Paula Sawicki	Region of Waterloo	psawicki@regionofwaterloo.ca
Matthew O'Neil	Region of Waterloo	moneil@regionofwaterloo.ca
Bridget Coady	Region of Waterloo	bcoady@regionofwaterloo.ca
Michelle Sergi	Region of Waterloo	msergi@regionofwaterloo.ca
John Hill	Region of Waterloo	jhill@regionofwaterloo.ca
Elaine Brunn Shaw	City of Cambridge	brunnshawe@cambridge.ca
James Goodram	City of Cambridge	goodramj@cambridge.ca
Trevor McWilliams	City of Cambridge	mcwilliamst@cambridge.ca
Matthew Chandy	Region of Waterloo	mchandy@regionofwaterloo.ca
Bryan Cooper	City of Cambridge	cooperb@cambridge.ca
Brooke Lambert	City of Cambridge	lambertb@regionofwaterloo.ca
Shannon Noonan	City of Cambridge	noonans@cambridge.ca
Eric Peissel	WSP	Eric.Peissel@wspgroup.com
Irene Hauzar	WSP	ihauzar@pbworld.com

Item:	Discussion:	Action by:
	These notes summarize the key discussion items and questions that were raised during the meeting. The presentation slides are appended for reference.	
<b>1.0</b>	<b>Slides 3-5 (Overview of the Evaluation Process)</b>	
	<p>1.1 WSP presented the differences between N2 and N3 pertaining to the four categories that were considered in the evaluation matrix: transportation, social/cultural, environmental, and economic impacts.</p> <p>1.2 WSP presented the current ridership numbers for the proposed stops as well as several potential stop locations for the N2 alignment and the estimated capital costs for N2 and N3.</p> <p>1.3 Question was asked regarding how the capital costs were calculated, since they are lower for N3 versus N2. N2 has greater costs associated because the two crossings over the overall length of the alignment. The LRT track was priced at \$6000/m and alternative N2 is 2.5 km longer than N3.</p>	

Item:	Discussion:	Action by:
	<p>1.4 Question was asked regarding the population of Preston this will be examined and a response provided.</p> <p>1.5 Question was asked regarding how the re-development potential was considered during the evaluation:</p> <ol style="list-style-type: none"> <li>1. Preston has some limited opportunity for development, as confirmed by both the Region and the City, there are some former industrial lands that provide re-development opportunities.</li> <li>2. In the Sportsworld area, there is a vision to intensify the current low density commercial land uses.</li> <li>3. The existing industrial park along the N2 alignment is relatively new, not likely to experience any redevelopment in the near future, no plans to convert the industrial uses to office uses.</li> <li>4. Eagle Street east of Speedsville has significant redevelopment potential.</li> </ol> <p>1.6 Regional Planning stated that the N2 alignment is not a rapid transit corridor within the OP, and therefore an OP amendment would need to be made to consider N2.</p> <p>1.7 A question was asked about a potential connection to the airport. The distance from Maple Grove to the airport is 6km, and from Sportsworld its 6.1 km. The Transportation Master Plan is underway, and a connector service could be proposed as part of the Master Plan.</p> <p>1.8 Hunt Club is projected to have approximately 4,100 residents, with approximately 1,300 jobs. Walkability was not used to determine catchment areas. This analysis provided by the City of Cambridge is attached to these minutes.</p>	WSP
<b>2.0</b>	<b>PCC #2</b>	
	<p>2.1 Include a mailing notice that has a "Save the Date".</p> <p>2.2 All meeting materials will be public as of September 9, it will be part of the Council Agenda. The PCC #2 boards will be shown at the TAC #4 meeting on August 24.</p> <p>2.3 PCC comment period will be one month.</p> <p>2.4 A single preferred alternative system, which includes N3, will be taken to the public in September for feedback.</p> <p>2.5 Region to send revised evaluation matrices, without the comment/response table to attendees.</p> <p>2.6 Formal input from the City of Cambridge will comment on the evaluation criteria generally as presented.</p>	

## MEETING NOTES – Ainslie Street Terminal Meeting

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPA Process
<b>OBJECTIVE</b>	To discuss alternative locations for the terminal station in Cambridge
<b>DATE / TIME</b>	August 12, 2016 @ 1:00pm
<b>LOCATION</b>	100 Maple Grove Rd, Boardroom
<b>PROJECT No.</b>	161-07859-00

Attendees	Organization	e-mail
Paula Sawicki	Region of Waterloo	psawicki@regionofwaterloo.ca
Matthew O'Neil	Region of Waterloo	moneil@regionofwaterloo.ca
John Cicuttin	GRT	jcicuttin@regionofwaterloo.ca
Reid Fulton	GRT	rfulton@regionofwaterloo.ca
John Hill	Region of Waterloo	jhill@regionofwaterloo.ca
Valerie Spring	City of Cambridge	springv@cambridge.ca
Trevor McWilliams	City of Cambridge	mcwilliamst@cambridge.ca
Shannon Noonan	City of Cambridge	noonans@cambridge.ca
Andrea Stebbings	Galt on the Grand (BIA)	info@galtonthegrand.ca
Eric Peissel	WSP	Eric.Peissel@wspgroup.com
Denise Morneau	WSP	morneaud@mmm.ca

Item:	Discussion:	Action by:
	These notes summarize the key discussion items and questions that were raised during the meeting. The presentation slides are appended for reference.	
<b>1.0</b>	<b>Operating vision and needs for southern LRT terminus/future of Ainslie Terminal</b>	
	1.1 Discussion on need for a central terminus for all bus routes and LRT or the possibility of doing on-street connections with no bus terminal 1.2 GRT expressed openness to doing on-street connections, but would require additional terminals at other locations in Cambridge to provide layover and driver facilities 1.3 Discussion as to what creates a better urban realm and opportunity for redevelopment, an off-street major terminal or multiple on-street stops	
<b>2.0</b>	<b>Overview of reconfiguration alternatives for South Cambridge and potential stop locations</b>	
	2.1 Overview of the different alternatives developed (see attached presentation slides)	
<b>3.0</b>	<b>Open discussion regarding needs and potential impacts</b>	
	3.1 Queens Square is where the cenotaph is located and is a solemn location with historic buildings and is not a good location for a terminal 3.2 The narrowness of the streets in the Downtown make it difficult to run LRT and any layovers would be complex 3.3 Extension south to Concession has merit and should be done in the centre of Wellington Street to allow for redevelopment 3.4 A new pedestrian bridge across the Grand is planned between Bruce	

Item:	Discussion:	Action by:
	<p>and Walnut streets</p> <p>3.5 A new alternative running in the centre of Wellington and then down Bruce to the new foot bridge would give access to the western portion of Downtown</p> <p>3.6 Bruce has lots of redevelopment potential and it seems possible that it could be widened to accommodate LRT due to several abandoned buildings along the street</p> <p>3.7 A residential development is planned next to the Dunfield Theatre and this would be accessible using the new pedestrian bridge</p> <p>3.8 It was concluded that two new alternatives in Downtown should be examined on top of the current alternative to use the Ainsle terminal:</p> <ol style="list-style-type: none"> <li>1. Extension down the centre of Wellington to Concession</li> <li>2. Extension down the centre of Wellington to Bruce and then down Bruce to Water</li> </ol>	
<b>4.0</b>	<b>Next Steps</b>	
	4.1 The two new concepts forwarded will be developed to see what the impacts and design implications are	WSP  WSP

Attached: Powerpoint Presentation

**From:** Peissel, Eric  
**Sent:** September 8, 2016 3:48 PM  
**To:** Stefan Linder  
**Cc:** Matthew O'Neil; Paula Sawicki; Morneau, Denise; Grundon, Bruce; Hauzar, Irene  
**Subject:** RE: CN Meeting- Stage 2 ION - LRT from Kitchener to Cambridge

Hello Stefan

Since the meeting we had was brief I figured an email version of the minutes would be sufficient:

1. Meeting started at 1:35pm at 1 Administration Rd, Vaughan, ON
2. Eric Peissel presented Stage 2 of the IO project:
  - a. Extension of Stage 1 south to Cambridge
  - b. Currently at the stage of identifying the preferred alternative as part of a TPAP EA process
  - c. Two interfaces are foreseen with CN property
    - i. Level crossing at Eagle and Spur line that connects to CP
    - ii. Rail spur that forms an L between Eagle and Hespeler
  - d. Currently in conceptual design with preliminary design starting in the Fall
  - e. Construction foreseen in 2025 timeframe, but desire to get everything prepared well in advance
3. The current conceptual design for the two interfaces with CN were presented:
  - f. For the Eagle crossing requested information if spur was required to be maintained from Eagle south or if there was a possibility to purchase this portion of the R.O.W.?
  - g. If the Eagle crossing must be maintained can a level crossing be done considering LRTs operate using line-of-sight (like a bus) and that the OCS wires would preclude the use by Double Stacks rail cars
  - h. For the L Spur planning to run adjacent to the corridor but would require some property in the northern part of that corridor and possibly a small strip along some other parts
    - i. The L Spur tracks are retained in their current position
    - j. The proposed alignment avoids two additional at-grade crossings and no disruptions to the service along the spur
4. Comments from Stefan Linder:

- k. Meeting general manager tomorrow (Friday the 9<sup>th</sup>) and will discuss with him
  - l. Will also confirm acquisition requests
  - m. Expects to be able to provide feedback within 2 weeks or so
  - n. Requested that conceptual design be sent to him for Friday meeting
5. End of Meeting at 1:55pm

Also requested files sent after the meeting.

Regards



**Eric Peissel**, MCIP, MUP, urb.  
Vice President Transportation – Western Canada

**WSP Canada Inc.**  
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[www.wspgroup.com](http://www.wspgroup.com)

*Please consider the environment before printing... | Avant d'imprimer, pensez-y...*

-----Original Appointment-----

**From:** Paula Sawicki [<mailto:PSawicki@regionofwaterloo.ca>]

**Sent:** September-01-16 9:35 AM

**To:** Paula Sawicki; Matthew O'Neil; Peissel, Eric; Stefan Linder

**Subject:** CN Meeting- Stage 2 ION - LRT from Kitchener to Cambridge

**When:** September-08-16 1:30 PM-3:00 PM (UTC-05:00) Eastern Time (US & Canada).

**Where:** 1 Administration Road, Stn 515, Concord, ON - Room TBD

Stefan to book a meeting room.

## MEETING NOTES – Ministry of Transportation (MTO)

### Meeting No. 2

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPA Process
<b>OBJECTIVE</b>	To present the proposed Preliminary Design Criteria for the King Street crossings of Highway 8 and Highway 401, and receive MTO’s feedback
<b>DATE / TIME</b>	September 23, 2016, 9:30am
<b>LOCATION</b>	Ministry of Transportation, West Region 659 Exeter Road, London
<b>PROJECT No.</b>	161-07859-00

<b>Attendees</b>	<b>Organization</b>	<b>e-mail</b>
Scott Howard	MTO – Planning & Design	scott.howard@ontario.ca
Martin Haalstra	MTO – Structural	martin.haalstra@ontario.ca
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Carmen DeLeon	MTO – Traffic	carmen.deleonmorillo@ontario.ca
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Paula Sawicki	Region of Waterloo	psawicki@regionofwaterloo.ca
Matthew O’Neil	Region of Waterloo	moneil@regionofwaterloo.ca
Eric Peissel	WSP	Eric.Peissel@wspgroup.com
Denise Morneau	WSP	morneaud@mmm.ca
Bruce Grundon	WSP	Bruce.grundon@wspgroup.com
Tamsin Silvester	WSP	silvestert@pbworld.com

<b>Item:</b>	<b>Action by:</b>
WSP provided a brief presentation with an overview of the Waterloo LRT Stage 2 project and the proposed Preliminary Design Criteria (PDC) for the King Street crossings of Highway 8 and Highway 401. These notes summarize the discussion points and action items. The presentation slides and draft Preliminary Design Criteria are appended for reference.	
<b>1. Design – Highway 8/King Street</b>	
1.1. WSP presented the proposed cross-section, noting that the proposal is to reduce King Street to one general traffic lane in each direction through the interchange area, with the additional width being utilized for the LRT corridor. This is consistent with the existing King Street cross-section to the north, which is to remain as a two lane roadway in the long term.	
1.2. WSP will further develop how the multi-use trail will cross the interchange ramp as part of preliminary design.	WSP
1.3. MTO prefers to avoid “must exit” lanes, as shown on the concept drawing for the S-W ramp. Existing King Street NB Lane 2 drops just north of Highway 8. WSP will review this condition from a volume and safety perspective to determine if the urban cross section and relatively lower speed provide sufficient time for decision making.	WSP

Item:	Action by:
<p>1.4. MTO noted concern that the southbound lane is too wide (4.80 m). According to the Stage 2 ION study approved design criteria, 4.80m is the minimum “carriageway” width for a lane between two non-mountable obstacles (curbs). This width is based on the need to maintain traffic and emergency services in case of a vehicle break-down. It is acknowledged that MTO design criteria will (govern the design/take precedence) at the interchanges. WSP will review opportunities to reallocate width to provide a continuous strip adjacent to the multi-use trail.</p>	WSP
<b>2. Design – Highway 401/King Street</b>	
<p>2.1. WSP presented the proposed cross-section, noting that same number of general traffic lanes are provided, and a sidewalk has been added on both sides to address existing pedestrian movement in the area that is evident from tracking in the grass strip adjacent to the road.</p> <p>2.2. The ultimate configuration of the interchange was discussed and WSP noted that the lane configuration through the bridge area has been reviewed to verify that it will work with the new ramp arrangements. It was agreed that the traffic analysis will consider both interim and ultimate scenarios.</p> <p>2.3. MTO advised that the preliminary design for the future ramp from Highway 8 to Highway 401 westbound may have a pier located in the median of King Street, which would need to be accommodated with the LRT configuration. WSP will obtain the preliminary design drawings from the MMM design team undertaking the Highway 401 widening project. The opportunity to construct the pier footing and column as part of the LRT project should be considered, to avoid future disruption to LRT service. <b>Post-meeting note: the Stantec Preliminary Structural Design Report (June 2010) shows a 40m clear span over King Street in the Hwy 8 N-W ramp preliminary general arrangement drawing.</b></p> <p>2.4. WSP noted that the Highway 401 bridge width is such that OCS poles can be positioned on each side, and therefore no power equipment for the LRT will need to be attached to the bridge. MTO noted that as part of the preliminary design study for the Highway 401/Grand River bridge, the team will be examining adding HOV lanes, which may result in the bridge being widened. WSP will discuss this with the MMM design team to assess potential solutions.</p> <p>2.5. MTO prefers that the S-W ramp be a direct taper, rather than a right turn. This will be reviewed further in preliminary design, for both the current and ultimate configuration of the interchange.</p>	<p>WSP</p> <p>WSP</p> <p>WSP</p>
<p>2.6. MTO noted that they have not looked at eliminating movements at the interchanges and that they need to maintain on-going access.</p>	

Item:	Action by:
<b>3. Design – General Comments</b>	
<p>3.1. MTO requested further details on pier protection requirements adjacent to the LRT and the adequacy of the shy distance shown between the LRT lane and the general traffic lane. WSP explained the dynamic envelope for the LRT vehicle and the resultant horizontal and vertical clearance requirements, and described the implementation of an anti-derailment system involving a second track through the interchange area. WSP will add the clearance envelope to the cross-sections and provide further comments in the PDC regarding the protection measures proposed.</p> <p>3.2. WSP noted that the LRT will utilize embedded track and therefore there is no significant elevation difference between the LRT guideway and the adjacent traffic lanes, and explained that the rolled curb between the vehicular lanes and the LRT guideway is provided to minimize the risk that vehicles drift onto the tracks. WSP clarified that the pavement is flush at ramp terminal intersections to accommodate left turns.</p> <p>3.3. WSP provided copies of the latest concept drawings to MTO via USB drive.</p> <p>3.4. WSP acknowledged that the draft Preliminary Design Criteria is a work in progress and will be further expanded to include a key plan and other relevant notes during preliminary design using the MTO template.</p>	WSP
<b>4. Traffic</b>	
4.1. Traffic analysis is required to assess the proposed reduction of King Street to two lanes through the interchange area and the impacts on ramp operations at both locations, with a forecasting horizon year of 2041. Analysis at Highway 401 to consider both current and ultimate configuration.	WSP
4.2. WSP will review whether the turning volumes at Deer Ridge Drive (south of the W-S ramp at King Street/Highway 8) are high enough that the lane backs up onto King Street and potentially affects the ramp.	WSP
4.3. MTO requested the traffic analysis at Hespeler/Pinebush/Eagle to verify that there are no impacts to the operation of the Highway 401 ramps.	WSP
<b>5. Next Steps</b>	
5.1. MTO will carry out a more detailed review the draft Preliminary Design Criteria and the concept drawings, and provide further comments.	MTO
5.2. WSP to finalize the River Road and Highway 8 interchange design alternatives and present them to MTO.	WSP

# STAGE 2 ION LRT TRANSIT PROJECT ASSESSMENT

## MTO MEETING NO.2

SEPTEMBER 23, 2016

# MEETING AGENDA

- 1. Brief overview of the Stage 2 ION project and timeline**
- 2. Presentation of proposed Preliminary Design Criteria:**
  - **King Street at Highway 8**
  - **King Street at Highway 401**
- 3. Discussion and Feedback**
- 4. Next Steps**

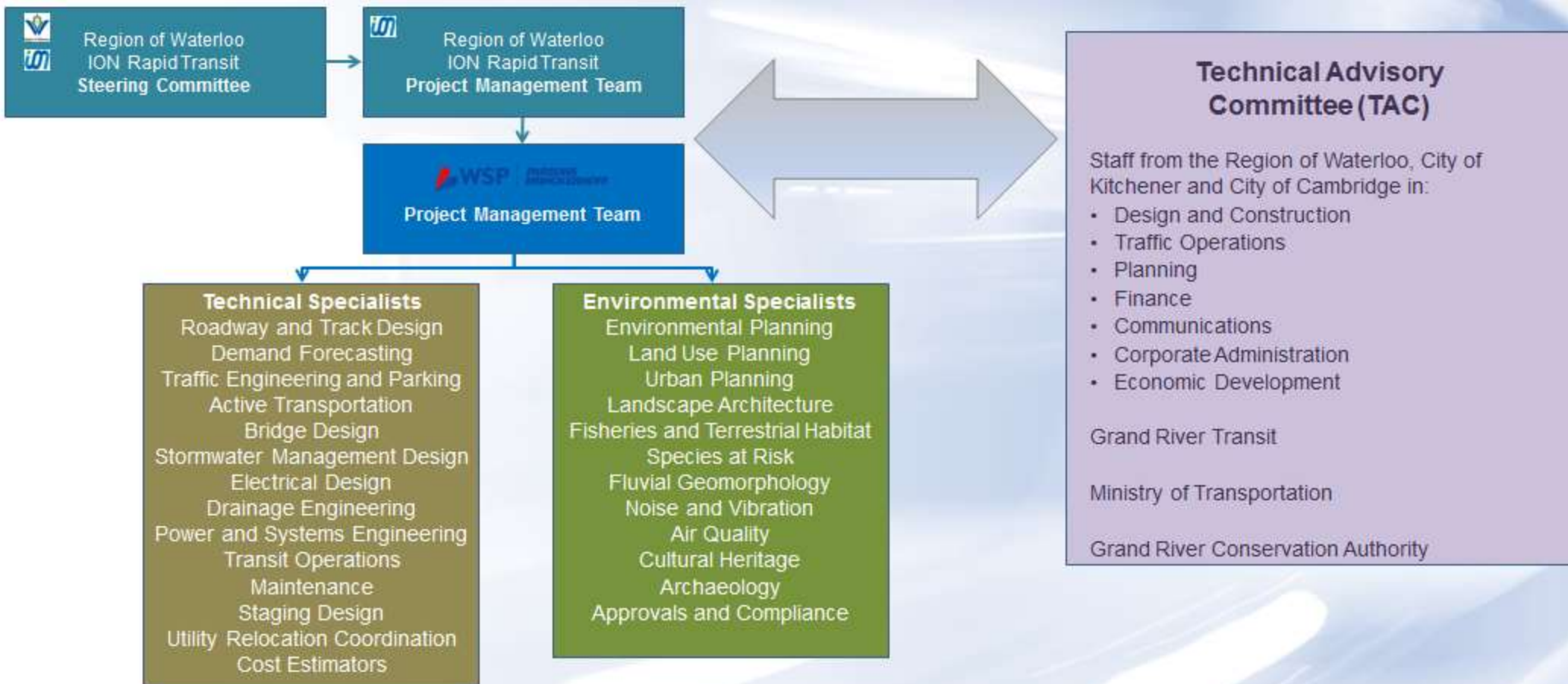
# ION TO DATE

- Stage 1 LRT construction is underway from Waterloo to Kitchener, and service will begin in 2018
- Bus Rapid Transit (BRT) from Kitchener to Cambridge was completed under Stage 1 and began operating in 2015
- Stage 2 ION will replace BRT with LRT, creating a continuous LRT system between Cambridge, Kitchener and Waterloo
- ION is the foundation for the Regional Official Plan objectives:

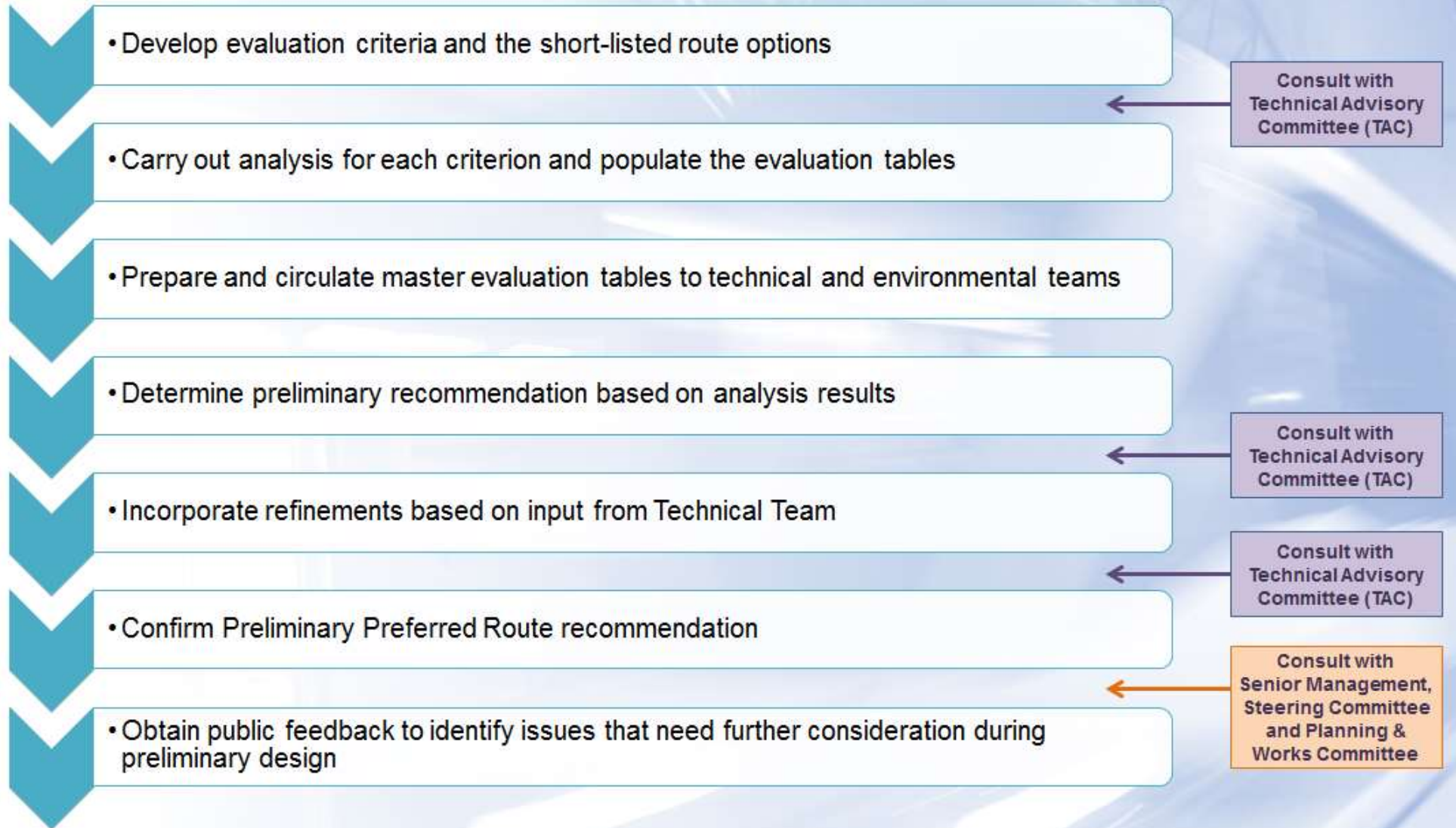


# PROJECT TEAM

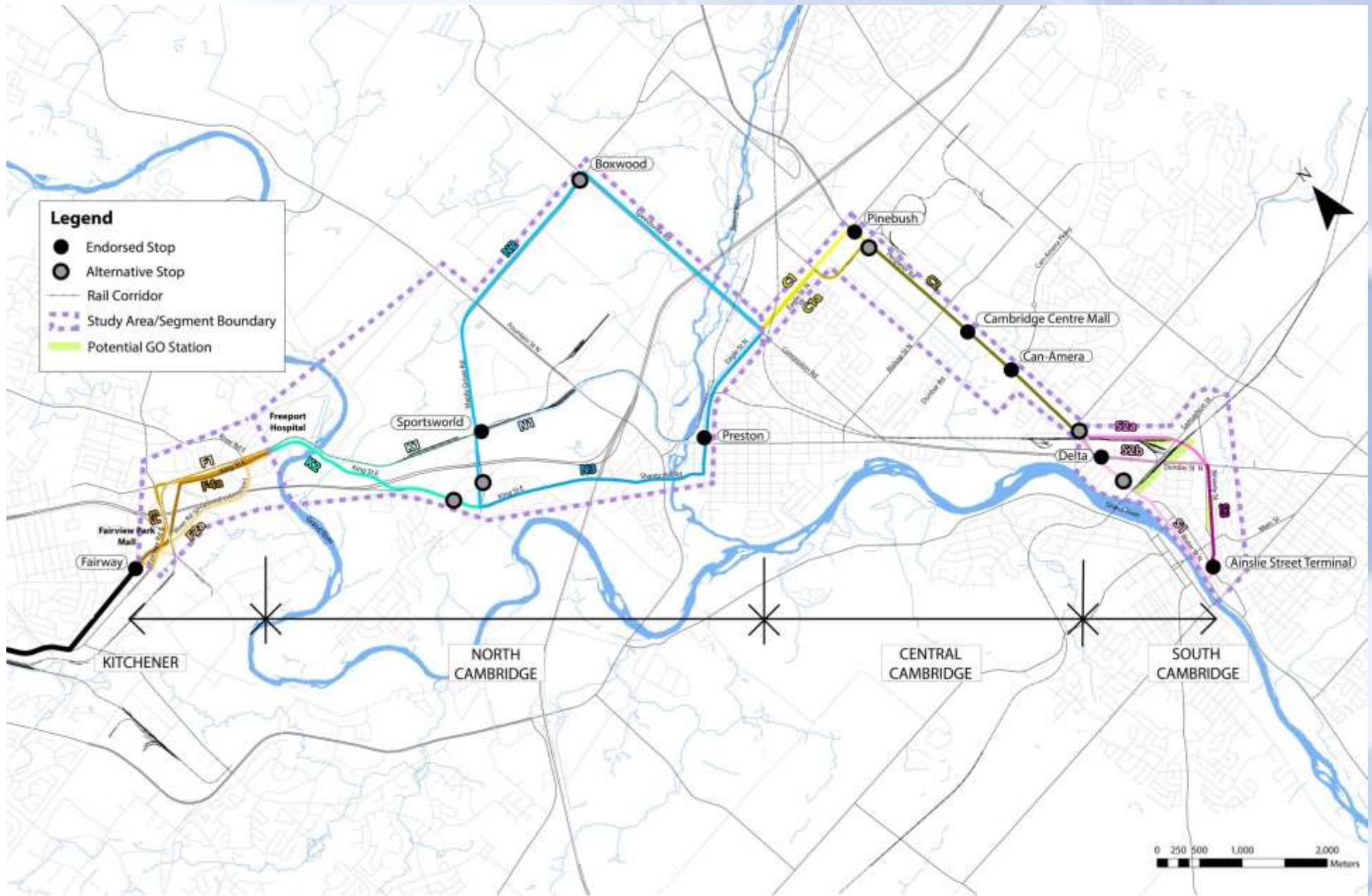
**The Technical Advisory Committee (TAC) has provided feedback and guidance throughout the process**



# EVALUATION PROCESS



# ROUTE ALTERNATIVES

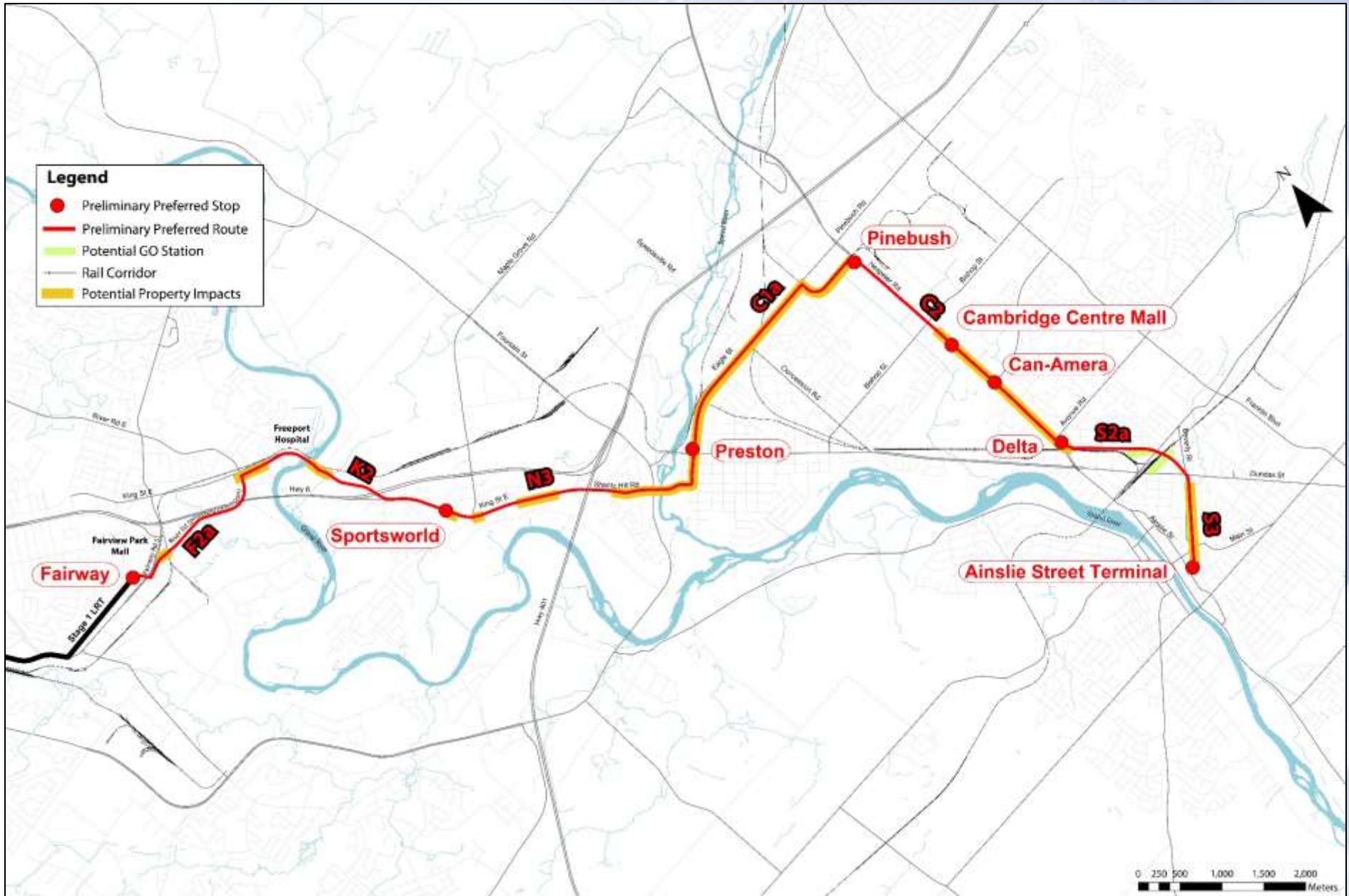


# EVALUATION CRITERIA

CRITERIA	INDICATORS
Transportation	<ul style="list-style-type: none"> <li>• Ability to Serve Multi-Modal Nodes</li> <li>• Impact on Traffic Operations</li> <li>• Engineering Challenges</li> <li>• Physical Constraints</li> <li>• Potential Ridership</li> </ul>
Social/Cultural Environment	<ul style="list-style-type: none"> <li>• Destinations Served</li> <li>• Properties Impacted</li> <li>• Cultural Heritage Impacts</li> <li>• Transit and Pedestrian Supportive Land Use Policy</li> </ul>
Natural Environment	<ul style="list-style-type: none"> <li>• Impact on Floodplains</li> <li>• Impact to Significant Natural Features</li> </ul>
Economic Environment	<ul style="list-style-type: none"> <li>• Ability to Serve Concentrations of Employment</li> <li>• Opportunity for Intensification and Revitalization</li> <li>• Cost (Capital and Operating) – Class D (<math>\pm 30\%</math>)</li> </ul>



# PRELIMINARY PREFERRED ROUTE



# PRELIMINARY DESIGN CRITERIA

## KING STREET AT HIGHWAY 8



# PRELIMINARY DESIGN CRITERIA

## KING STREET AT HIGHWAY 8

Existing King Street lane configuration underneath Highway 8

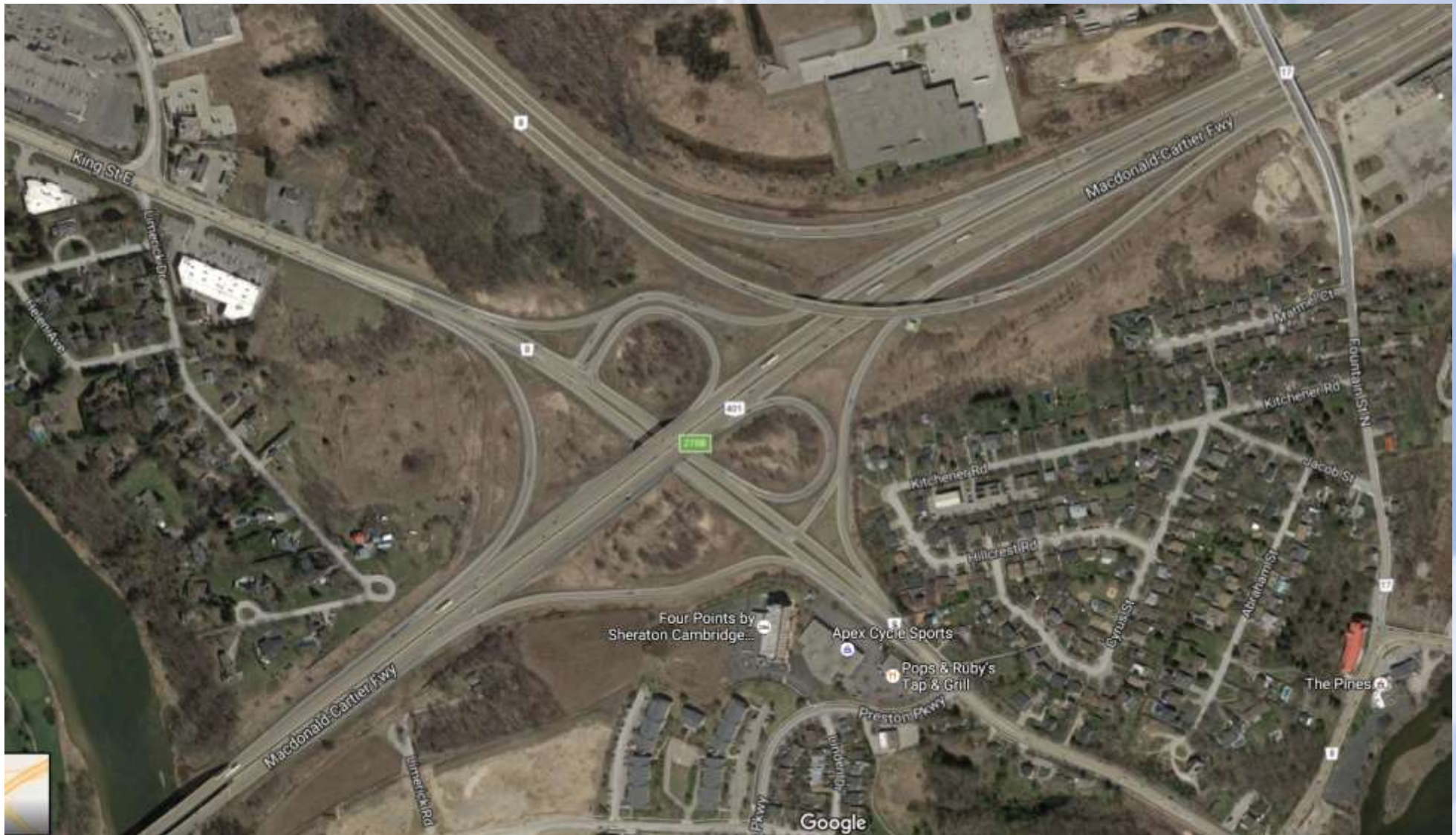


Proposed King Street lane configuration underneath Highway 8



# PRELIMINARY DESIGN CRITERIA

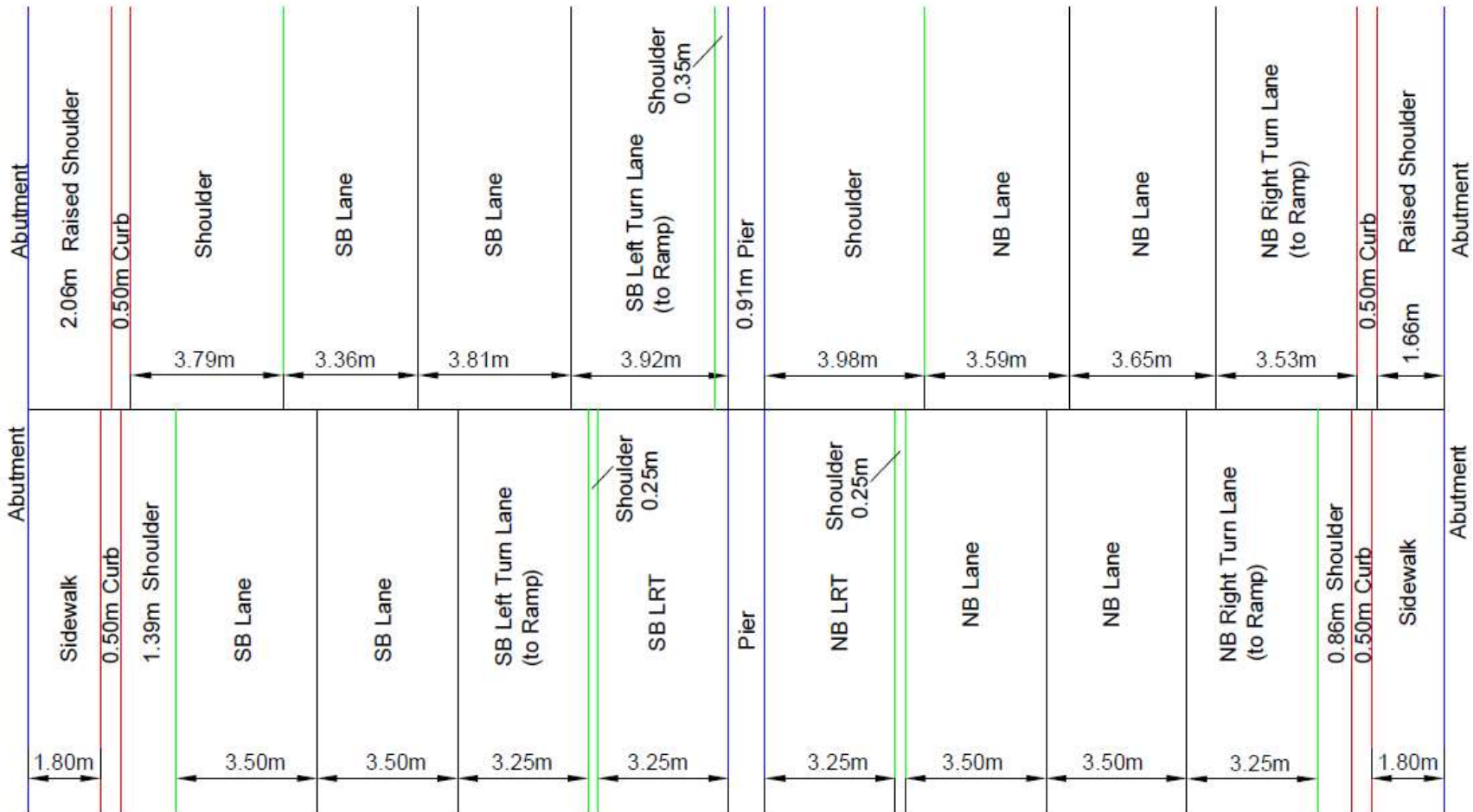
## KING STREET AT HIGHWAY 401



# PRELIMINARY DESIGN CRITERIA

## KING STREET AT HIGHWAY 401

Existing King Street lane configuration underneath Highway 401

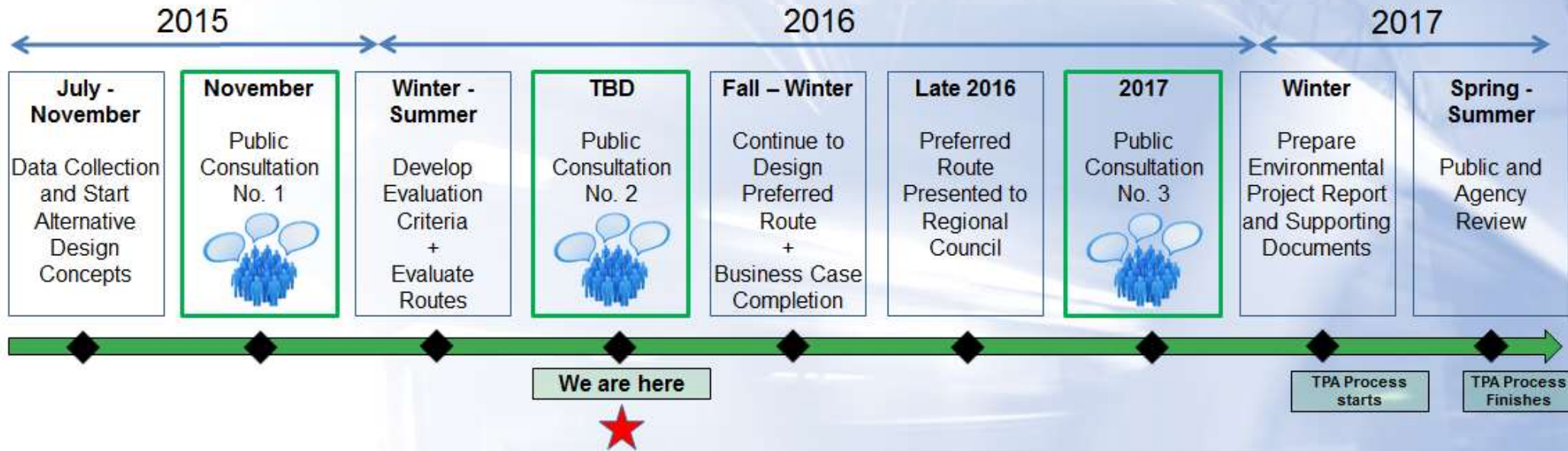


Proposed King Street lane configuration underneath Highway 401

King Street underpass at Highway 401 - south end



# NEXT STEPS



## Ongoing and upcoming activities:

- Impact assessment including meetings with key TAC members
- Preliminary design alternatives
- Travel demand modelling and ridership estimates
- Traffic operations analysis at intersections
- Site selection for Maintenance and Operations Facility and TPSS
- Preliminary design including additional engineering investigations and mitigation design
- Property requirements identification
- Consultation with TAC, public
- Documentation and TPA process

# FOLLOW-UP ITEMS FROM THIS MEETING

- Address comments on geometric elements
- Conduct traffic operations analysis (confirm forecast horizon)
- Prepare full Preliminary Design Criteria and confirm process for approval
- Advance preliminary design including preliminary staging
- Confirm permit requirements
- Ongoing consultation

## MEETING NOTES – Environmental Agency Meeting No. 1

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPA Process
<b>OBJECTIVE</b>	To introduce the Stage 2 ION LRT TPAP to the agency representatives, review the evaluation process followed to date, review environmental considerations, examine the Grand River and Speed River crossing alternatives, and determine the follow up consultation with environmental agencies
<b>DATE / TIME</b>	October 7, 2016 at 9:30am
<b>LOCATION</b>	100 Maple Grove Road, Training Room
<b>PROJECT No.</b>	161-07859-00

<b>Attendees</b>	<b>Organization</b>	<b>e-mail</b>	<b>Phone #</b>
Paula Sawicki	Region of Waterloo	psawicki@regionofwaterloo.ca	519-575-4035
Matthew O’Neil	Region of Waterloo	moneil@regionofwaterloo.ca	519-575-4757 x3462
John Brum	GRCA	jbrum@grandriver.ca	519-621-2763 x2233
Dave Balint	DFO	dave.balint@dfo-mpo.gc.ca	519-280-6356
Graham Buck	MNRF	graham.buck@ontario.ca	519-826-4505
Dave Marriott	MNRF	david.marriott@ontario.ca	519-826-4926
Kathy Padgett	City of Cambridge	padgettk@cambridge.ca	519-621-0740 x4826
Barbara Steiner	City of Kitchener	barbara.steiner@kitchener.ca	519-741-2200 x7293
Denise Morneau	WSP	morneaud@mmm.ca	905-823-8500 x1263
Irene Hauzar	WSP	ihauzar@pbworld.com	416-646-9032
Maged Ibrahim	WSP	ibrahimm@mmm.ca	905-882-4211 x6273
Bruce Grundon	WSP	bruce.grundon@wspgroup.com	416-807-9260
Sherif Iskandar	WSP	sherif.iskandar@wspgroup.com	905-475-7270
Grant Kauffman	LGL Limited	gkauffman@lgl.com	905-8331244
Emily Cassidy	Matrix Solutions	ecassidy@matrix-solutions.com	647-996-6512

<b>Item:</b>	<b>Discussion:</b>	<b>Action by:</b>
	These notes summarize the key discussion items and questions that were raised during the meeting. The presentation slides are appended for reference.	
1.	All attendees made introductions. WSP noted that the following consultant team specialists were present at the meeting to answer questions: <ul style="list-style-type: none"> <li>• WSP – route planning, bridge engineering, drainage engineering and environmental planning</li> <li>• LGL Limited – natural heritage</li> <li>• Matrix Solutions – fluvial geomorphology</li> </ul>	
2.	WSP provided an overview of the Stage 2 ION study area, the process undertaken to develop and assess route and station alternatives and the preliminary preferred route. WSP and LGL provided an overview of the environmental and drainage features at the proposed Grand River and Speed River crossings, including GRCA regulation limits.	

Item:	Discussion:	Action by:
3.	<p>WSP provided an overview of design alternatives for the proposed crossing of the Grand River, noting that the crossing is located between two existing bridge crossings (King Street and CP Rail). Three options were described, all on the same alignment but with different span lengths and pier placement. The following was noted:</p> <p>3.1 The Grand River is a warm water river.</p> <p>3.2 The regulatory flow level is 1m above the 100 year level; hydraulic analysis will be undertaken.</p> <p>3.3 The pier layout needs to take into account the hydraulics of the river, in particular how ice flows down the river at the proposed bridge including in relation to the adjacent CP and King Street bridges; consider having ice breakers in front of the bridge and lining up the piers.</p> <p>3.4 Construction timing will depend on the presence of Species at Risk; no construction will be permitted between March and June.</p> <p>3.5 Pedestrian access will be maintained beneath the bridge.</p> <p>3.6 Unnamed tributary located near Stonegate Road is wet most of the year; flows on the south side of King Street. Rainbow mussel is thought to be present at this location. MNRF and DFO requested that a visual survey be conducted at the appropriate time of year for the listed mussel. No handling or permits will be required.</p> <p>3.7 Consider potential erosion issues.</p> <p>3.8 Ice dams are anticipated which could impact construction during winter months. Cayuga Bridge is an example of working in the winter with caissons; team to investigate how construction was conducted.</p> <p>3.9 Permits will be required for any piers in the watercourse or on the small island in the river; piers located beyond the watercourse will not require permits.</p> <p>3.10 Work permit will be required from the Ministry of Natural Resources and Forestry (MNRF) for work on the shore lands (PLA Reg.239/13).</p>	<p>WSP</p> <p>WSP</p> <p>LGL</p> <p>Matrix</p> <p>WSP</p>
4.	<p>WSP discussed the Speed River crossing location, noting that bridge design alternatives are under development pending completion of environmental field work. The following was noted:</p> <p>4.1 The proposed bridge at the preliminary preferred route crossing of the Speed River would be approximately 100 m in length, and approximately 2 m higher than the regional flood plain at its lowest point.</p> <p>4.2 Shantz Hill, Fountain Street and Preston Town Centre areas have floodplain issues; need to determine what impact the LRT corridor and bridge crossing will have future flooding; a permit is required from GRCA (in addition to a potential permit from the municipality) to work in a regulated floodplain area.</p> <p>4.3 Field investigations were commenced in 2014; three season investigations were conducted along the 2011 Council endorsed alignment. Supplementary field data was collected in 2015/2016 when it was determined that alternative alignments would be examined in the study area. Additional field investigation will be undertaken prior to completing this EA.</p>	<p>WSP</p> <p>LGL</p>

Item:	Discussion:	Action by:
	<p>4.4 Species at Risk including wavy-rayed lamp mussel and silver shiner could exist in the study area. No targeted or detailed Species at Risk investigations have been conducted at this stage of the study; MNRF agreed that targeted Species at Risk surveys and the resulting Information Gathering Form (IGF) could be undertaken as part of a subsequent detail design project.</p>	
5.	<p>The following summarizes general discussion about other issues within the study area, beyond the Grand River and Speed River crossings:</p> <p>5.1 The project must abide by the Fisheries Act. It will be important to understand the duration of in-water works occur and if alterations will be temporary or permanent.</p> <p>5.2 The Hidden Valley Road area has regulated habitat for Jefferson Salamander; the habitat boundary has been changed. Existing beaver ponds are suitable habitat for Jefferson Salamander. Given the work undertaken for the River Road Extension Class EA, no further fieldwork is required for Jefferson Salamander as part of the Stage 2 ION study, as the grading limits will be constrained to the approved River Road design.</p> <p>5.3 The vegetated area located north of Hidden Valley Road (proposed future River Road interchange ramp, which is not within the scope of this study) has potential impacts to listed Little Brown Bat. Consideration may need to be given to mitigation for this species in detail design, if impacted by the proposed transit project.</p> <p>5.4 The existing box culvert on Freeport Creek near the Honda Dealership is a potential ecological restoration area. The floodplain model should be reviewed, and a visual assessment conducted.</p> <p>5.5 Groff Mill Creek is a warm water creek and there are no known sensitivities. Although there are no proposed modifications to Groff Mill Creek resulting from the Stage 2 ION project, the floodplain model should reviewed, and a visual assessment conducted.</p> <p>5.6 Visual assessment of the watercourse at Russ Street will be undertaken.</p> <p>5.7 Mill Creek is a cold water creek; it was noted that no encroachment is anticipated on the creek; however there may be impact on the creek's floodplain.</p> <p>5.8 Butternut trees have been identified in the study area, however based on the current concept design, these are not impacted by the proposed Stage 2 ION project.</p> <p>5.9 Birds that may be impacted include Barn Swallow, Chimney Swift and Eastern Meadowlark. The Ecological Land Classification (ELC) mapping should be consulted to determine if there is any potential encroachment into their habitat.</p> <p>5.10 LGL will request an updated habitat list from MNRF, as the original list is from 2014. Surveys can be conducted at the detailed design stage; permits may take up to one year to obtain.</p> <p>5.11 During the detail design phase, the MNRF Information Gathering Form (IGF) will be required; the IGF would be supported by targeted surveys.</p>	<p>LGL</p> <p>LGL</p> <p>LGL</p> <p>LGL</p> <p>LGL</p> <p>LGL</p>

Item:	Discussion:	Action by:
	<p>5.12 DFO advised to ensure that COSEWIC listings are up to date when determining impacts. DFO also noted that if there is a significant time lag between when the EA is completed and when the project proceeds to implementation, there is the potential for new Species at Risk and therefore additional investigations may be required.</p> <p>5.13 Provincially Significant Wetlands along the Speed River area will be confirmed using secondary source information; more detailed investigations will be required during the subsequent detail design stage.</p>	LGL
6.	<p>Following a summary of the key action items, WSP provided a brief overview of the next steps, which include finalizing the evaluation and preparing for Public Consultation Centre No. 2 in early 2017. Further consultation with the environmental agencies will be undertaken on an individual basis, as the preliminary design phase is progressed.</p>	

# RMW STAGE 2 ION LRT TPA PROCESS

## ENVIRONMENTAL AGENCY MEETING NO.1

OCTOBER 7, 2016

# MEETING AGENDA

- 1. Introductions**
- 2. Brief overview of the Stage 2 ION project and timeline**
- 3. Preliminary Preferred Alternative**
- 4. Environmental Considerations**
- 5. Crossing alternatives over the Grand River**
- 6. Crossing alternatives over the Speed River**
- 7. Discussion and Feedback**
- 8. Next Steps**

## MEETING OBJECTIVES

- **Introduce the Stage 2 ION LRT TPAP**
- **Review the evaluation process followed to date**
- **Review environmental considerations**
- **Examine the Grand and Speed River crossings**
- **Determine follow up consultation with environmental agencies**

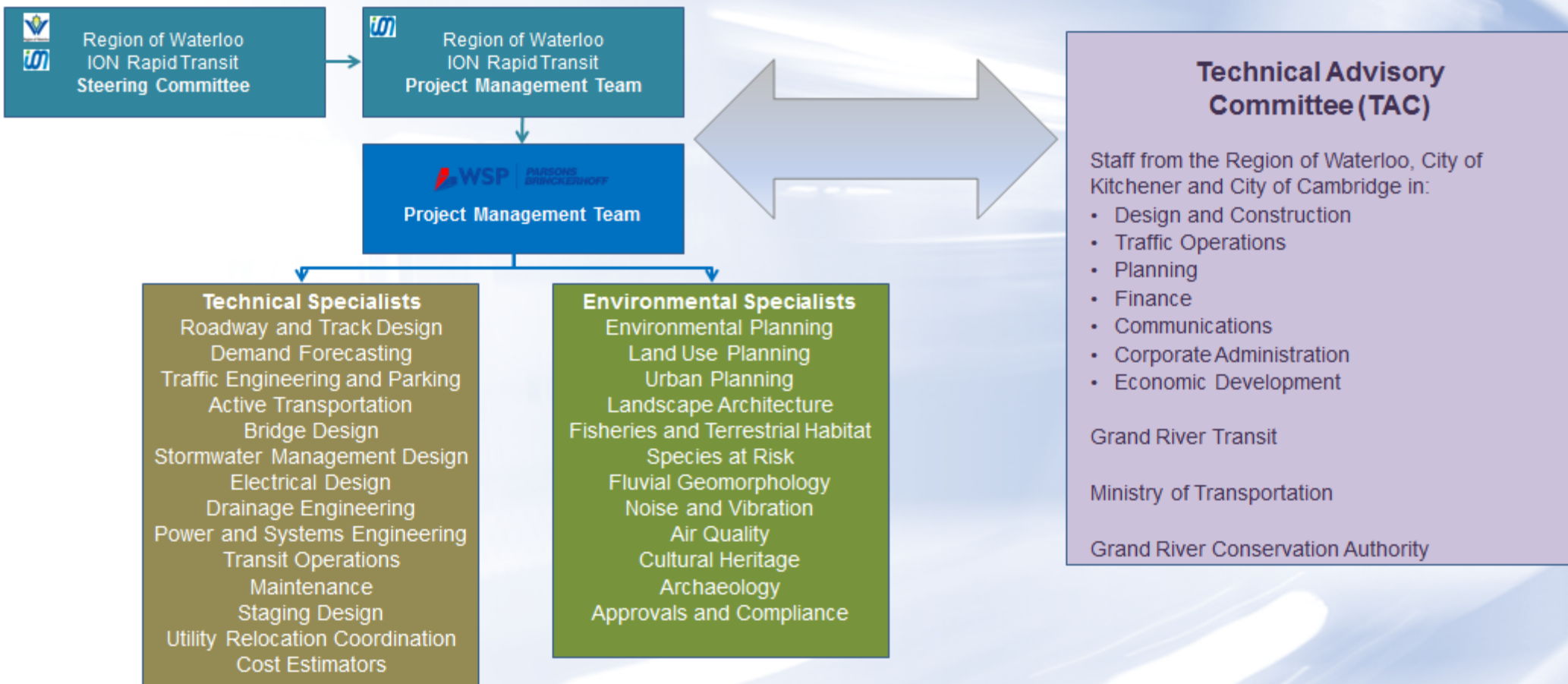
# ION TO DATE

- Stage 1 LRT construction is underway from Waterloo to Kitchener, and service will begin in 2018
- Bus Rapid Transit (BRT) from Kitchener to Cambridge was completed under Stage 1 and began operating in 2015
- Stage 2 ION will replace BRT with LRT, creating a continuous LRT system between Cambridge, Kitchener and Waterloo



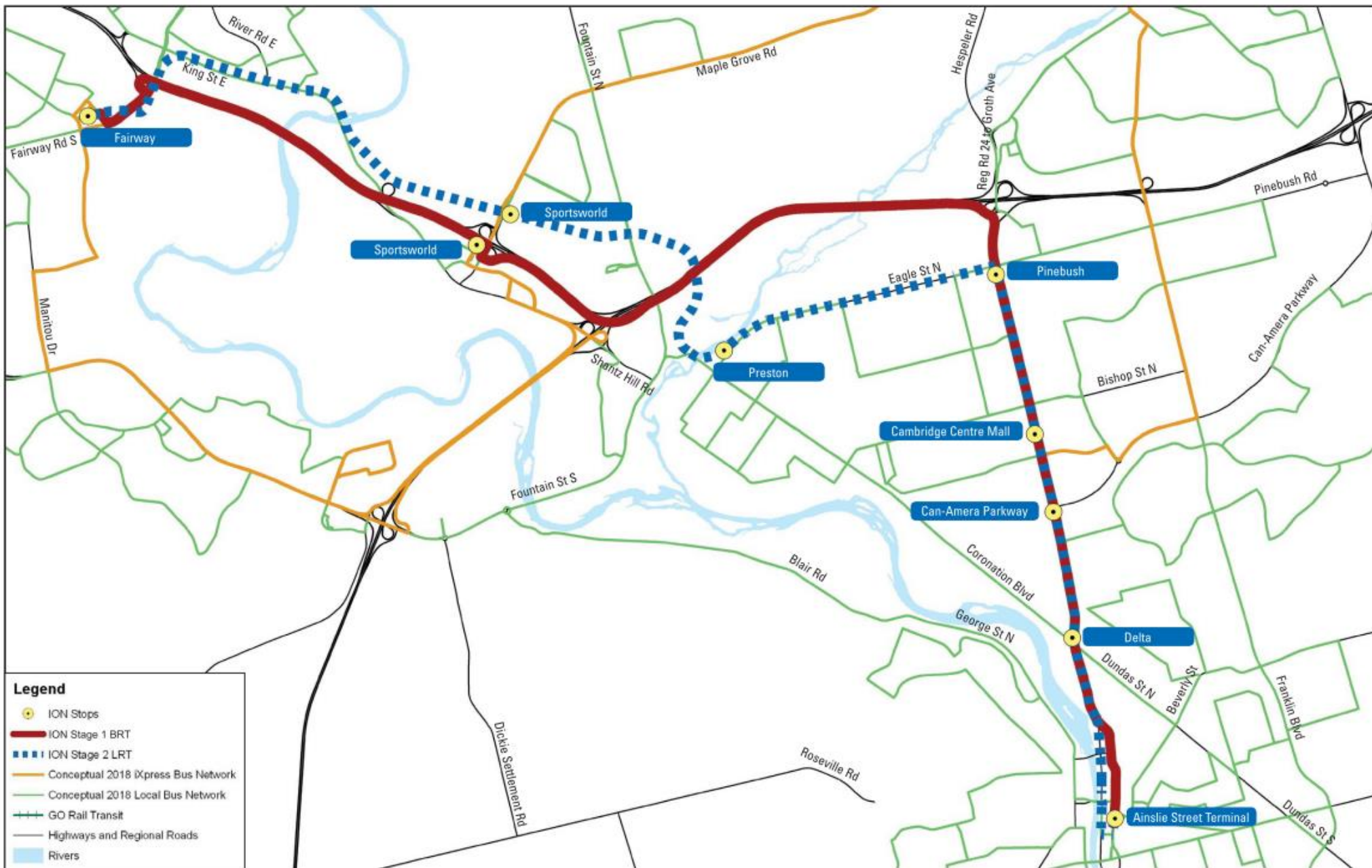
# PROJECT TEAM

**The Technical Advisory Committee (TAC) has provided feedback and guidance throughout the process**

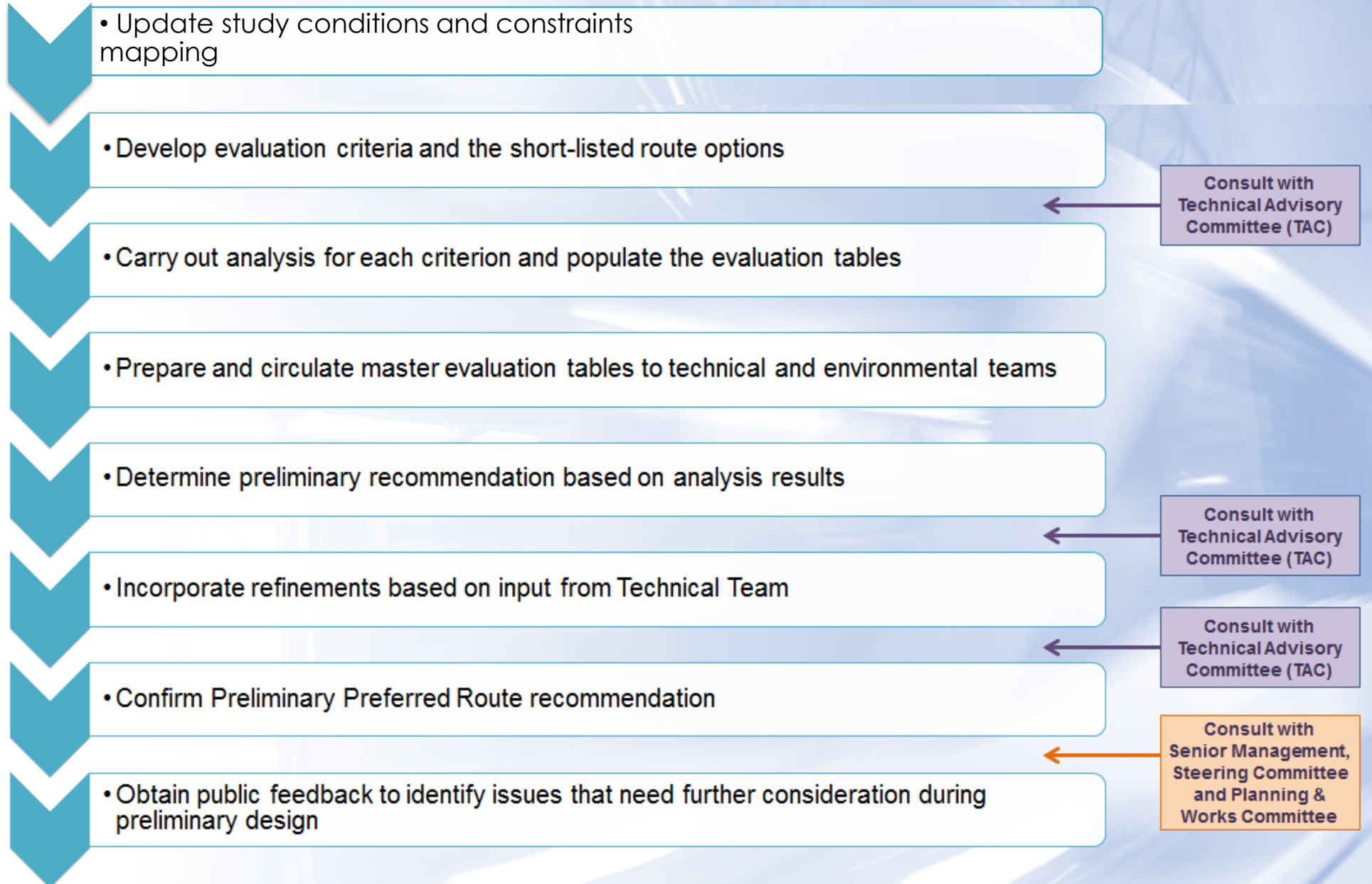




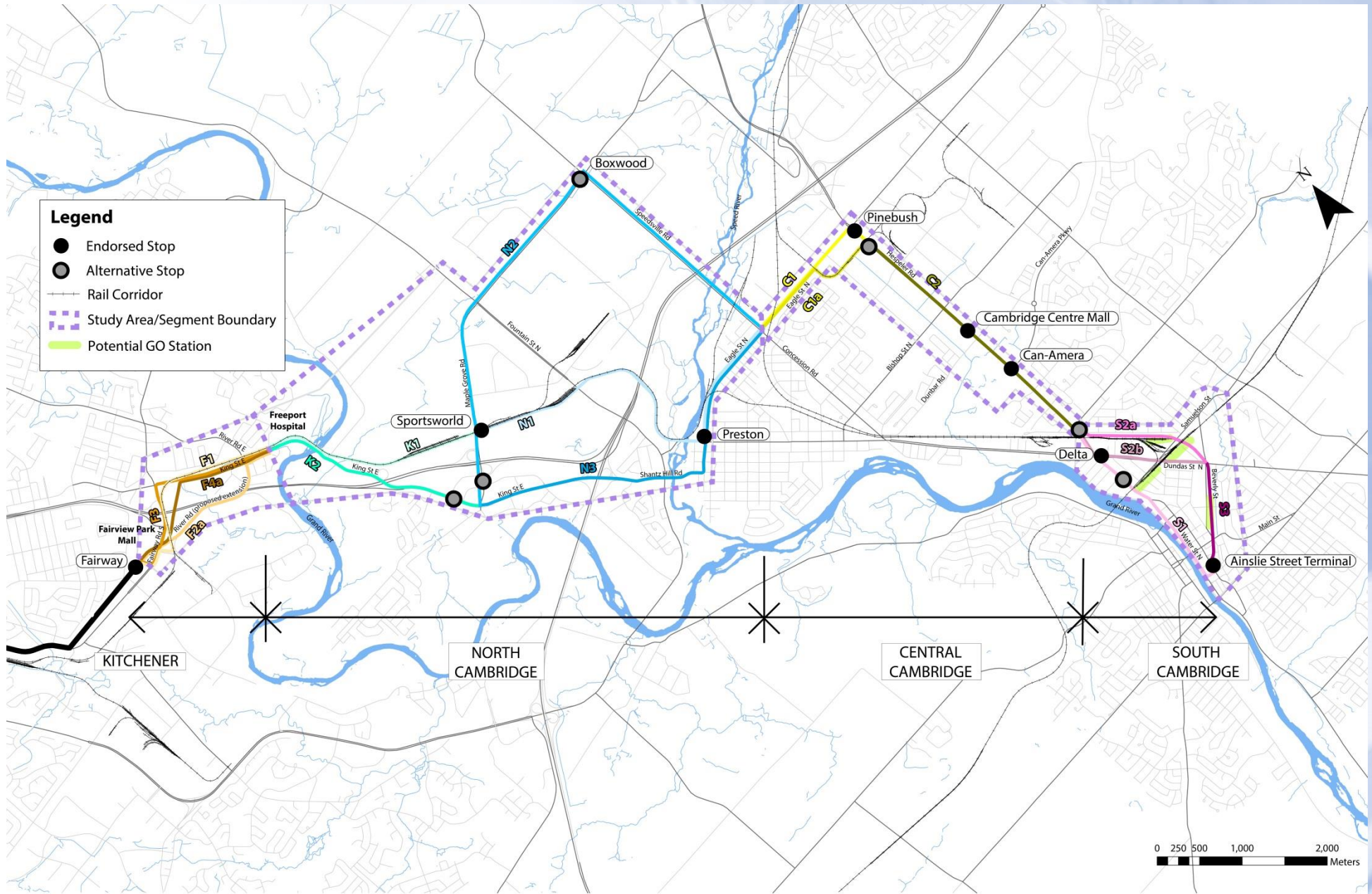
# 2011 Council Endorsed Plan-Stage



# EVALUATION PROCESS



# ROUTE ALTERNATIVES



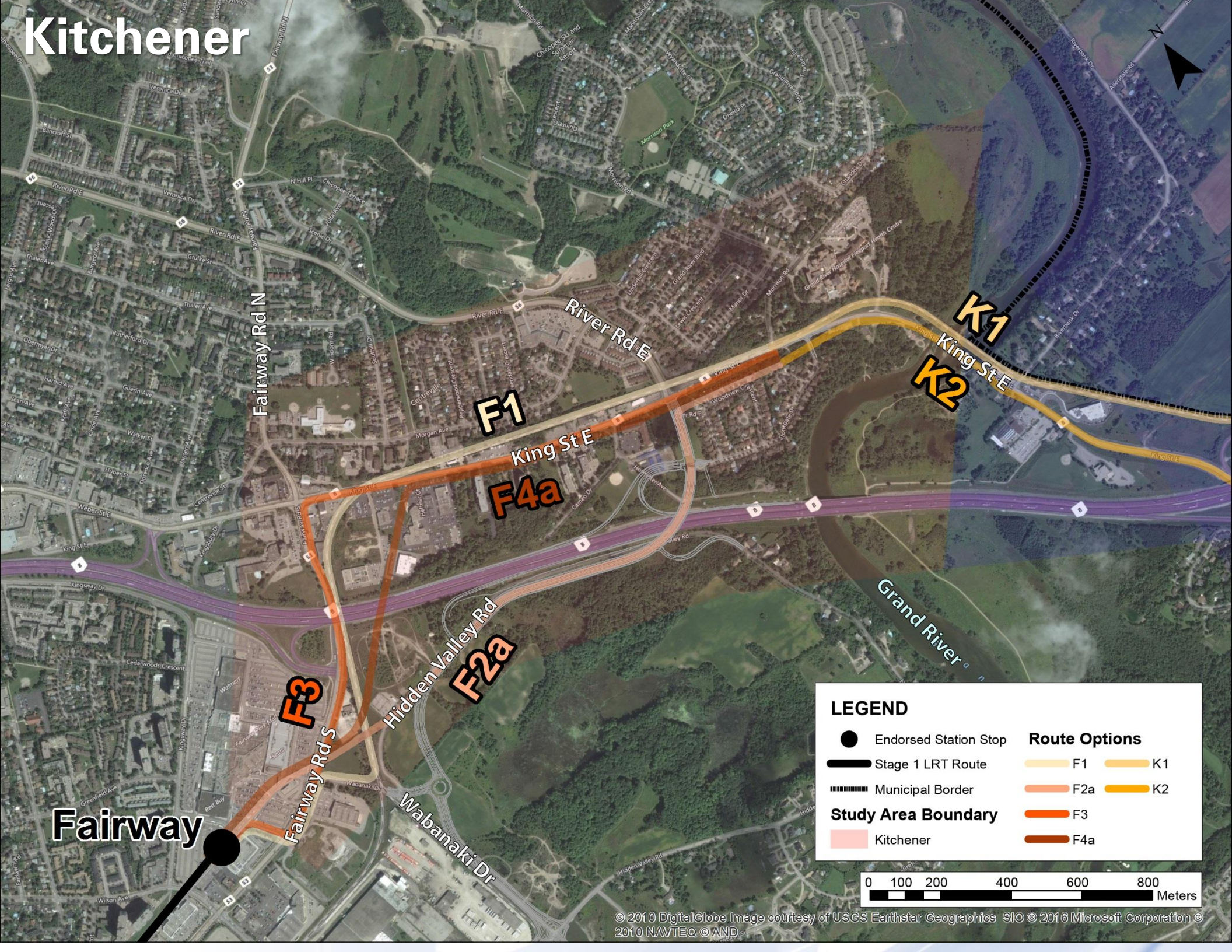
# EVALUATION CRITERIA

CRITERIA	INDICATORS
Transportation	<ul style="list-style-type: none"> <li>• Ability to Serve Multi-Modal Nodes</li> <li>• Impact on Traffic Operations</li> <li>• Engineering Challenges</li> <li>• Physical Constraints</li> <li>• Potential Ridership</li> </ul>
Social/Cultural Environment	<ul style="list-style-type: none"> <li>• Destinations Served</li> <li>• Properties Impacted</li> <li>• Cultural Heritage Impacts</li> <li>• Transit and Pedestrian Supportive Land Use Policy</li> </ul>
Natural Environment	<ul style="list-style-type: none"> <li>• Impact on Floodplains</li> <li>• Impact to Significant Natural Features</li> </ul>
Economic Environment	<ul style="list-style-type: none"> <li>• Ability to Serve Concentrations of Employment</li> <li>• Opportunity for Intensification and Revitalization</li> <li>• Cost (Capital and Operating) – Class D (<math>\pm 30\%</math>)</li> </ul>



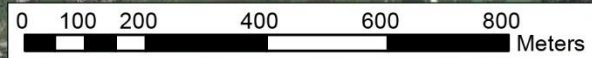
# Kitchener

# Fairway

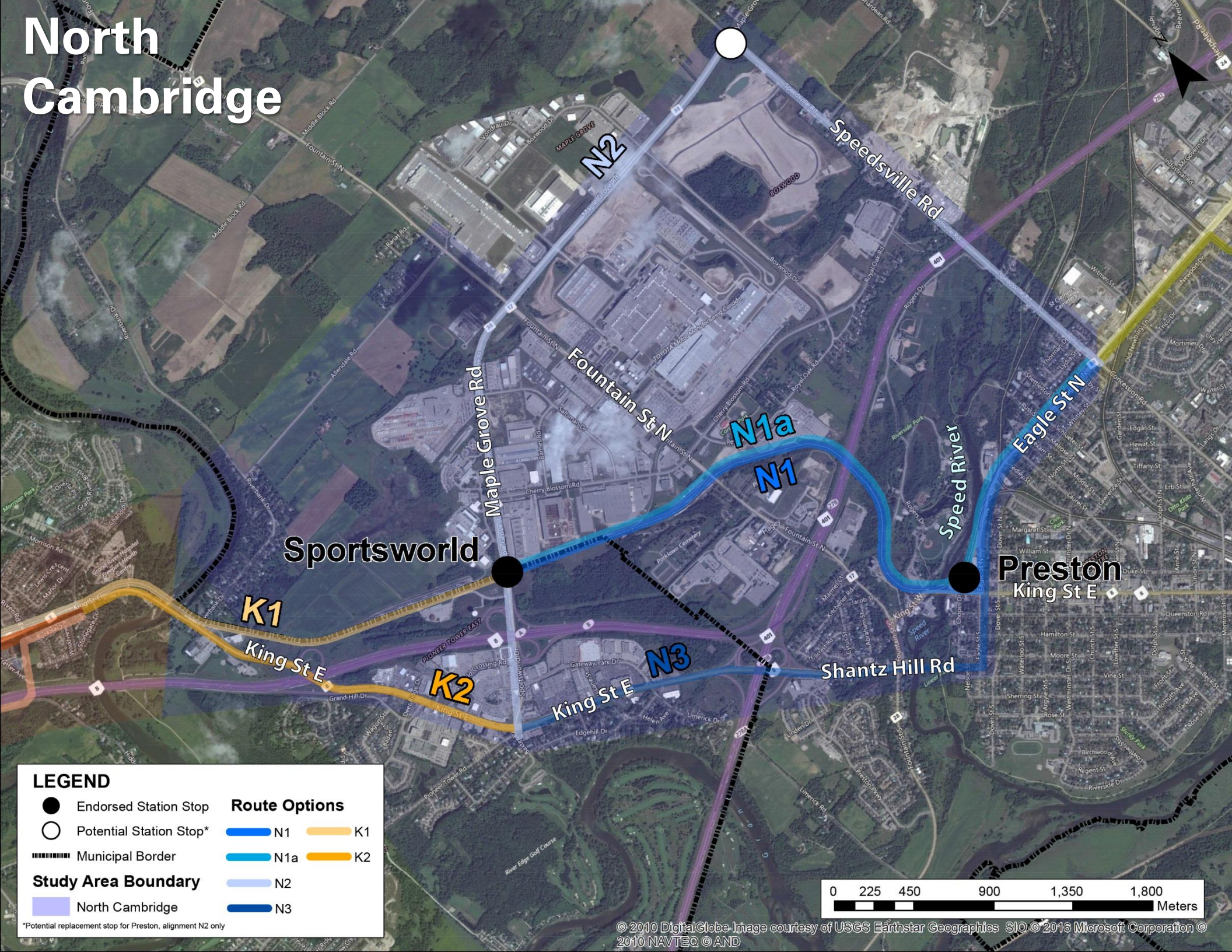


**LEGEND**

●	Endorsed Station Stop	<b>Route Options</b>	
—	Stage 1 LRT Route	F1	K1
- - -	Municipal Border	F2a	K2
▭	Study Area Boundary	F3	
▭	Kitchener	F4a	



# North Cambridge



## LEGEND

● Endorsed Station Stop

○ Potential Station Stop\*

▬ Municipal Border

▬ Study Area Boundary

▬ North Cambridge

## Route Options

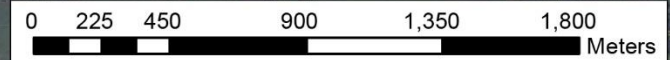
▬ N1    ▬ K1

▬ N1a    ▬ K2

▬ N2

▬ N3

\*Potential replacement stop for Preston, alignment N2 only



# Central Cambridge

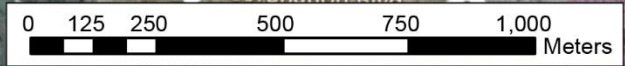
Pinebush

Cambridge Centre Mall

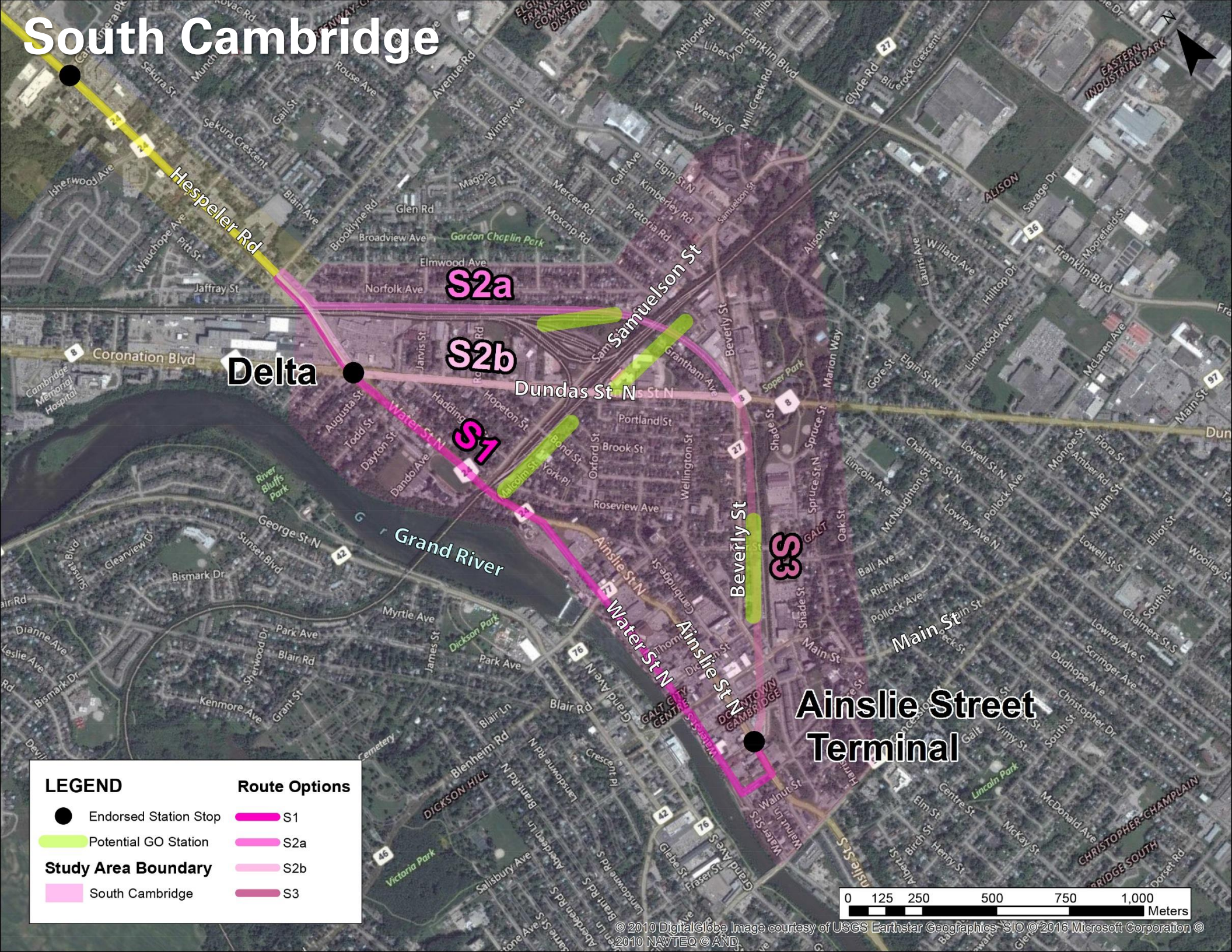
Can-Amerra

**LEGEND**

- Endorsed Station Stop
- Study Area Boundary**
- Central Cambridge
- Route Options**
- C1
- C1a
- C2



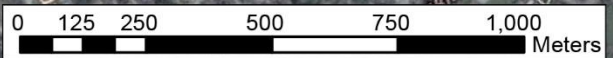
# South Cambridge



**Delta**

**Ainslie Street Terminal**

LEGEND		Route Options	
●	Endorsed Station Stop	—	S1
—	Potential GO Station	—	S2a
—	Study Area Boundary	—	S2b
—	South Cambridge	—	S3

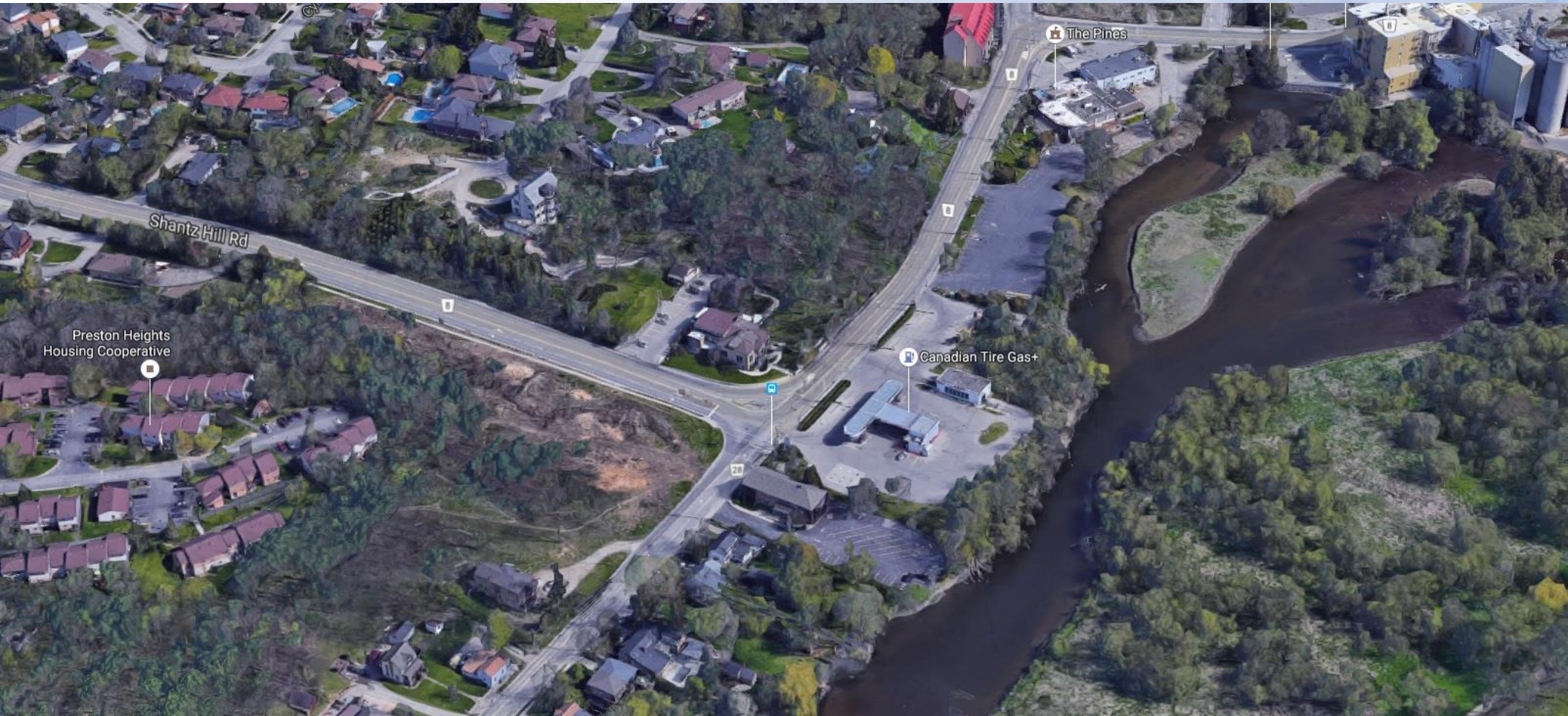




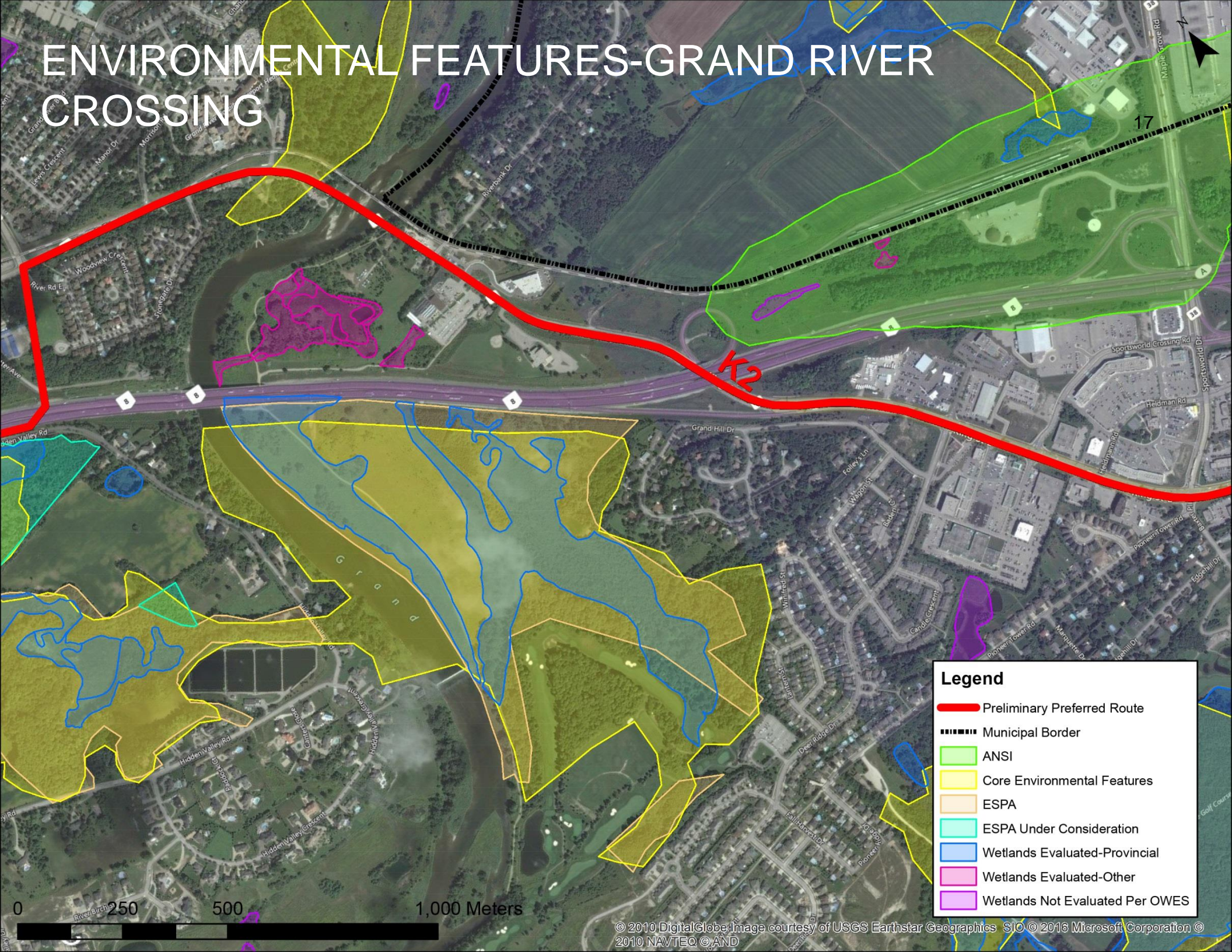
# GRAND RIVER, FACING SOUTH



# SPEED RIVER, FACING NORTH



# ENVIRONMENTAL FEATURES-GRAND RIVER CROSSING

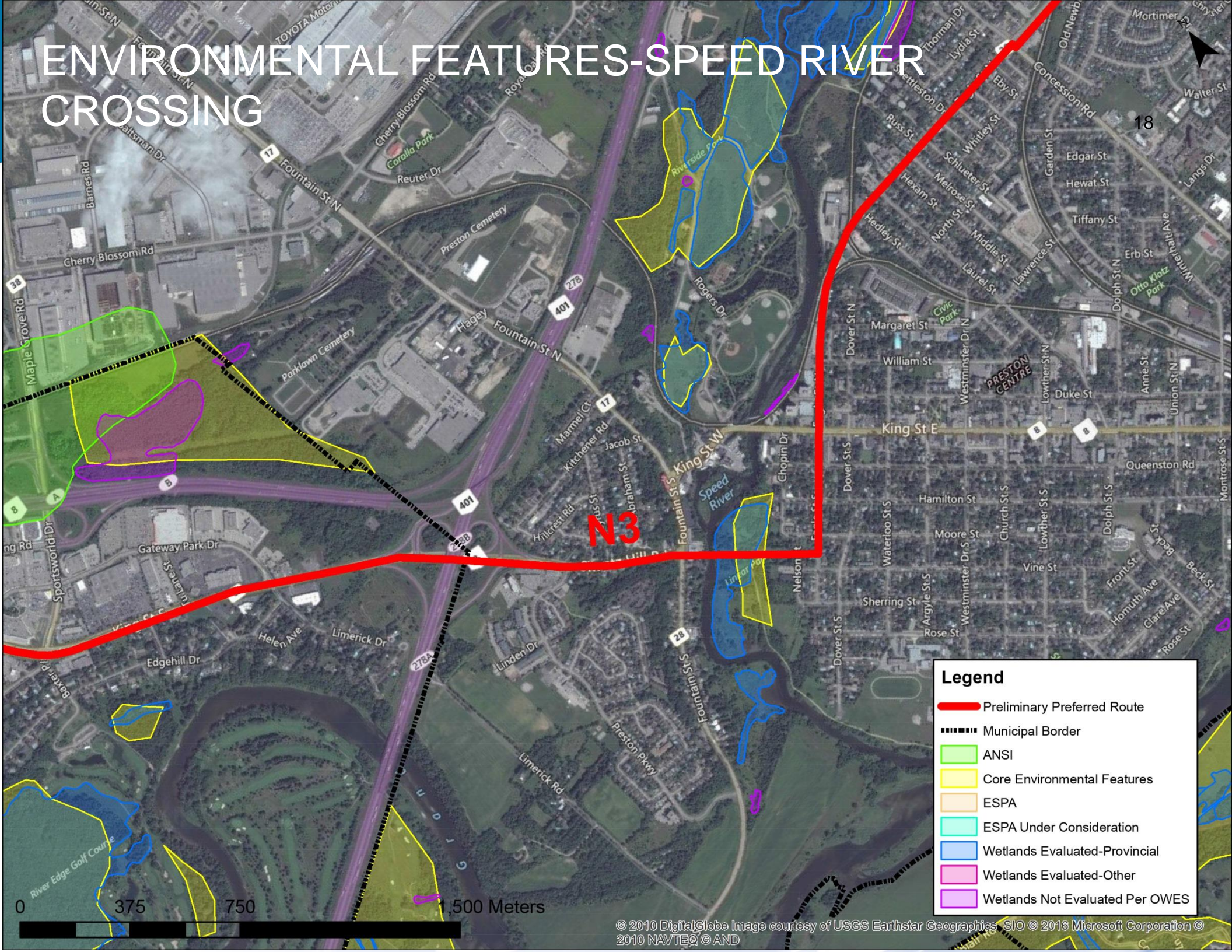


**Legend**

- Preliminary Preferred Route
- Municipal Border
- ANSI
- Core Environmental Features
- ESPA
- ESPA Under Consideration
- Wetlands Evaluated-Provincial
- Wetlands Evaluated-Other
- Wetlands Not Evaluated Per OWES

0 250 500 1,000 Meters

# ENVIRONMENTAL FEATURES-SPEED RIVER CROSSING



N3

18

**Legend**

- Preliminary Preferred Route
- - - - - Municipal Border
- ANSI
- Core Environmental Features
- ESPA
- ESPA Under Consideration
- Wetlands Evaluated-Provincial
- Wetlands Evaluated-Other
- Wetlands Not Evaluated Per OWES

0 375 750 1500 Meters

### Speed R Regulatory Limits

**LEGEND**

-  WATERSHED BOUNDARY (GRCA)
-  UTILITY LINE (NRVIS)
-  ROADS-ADDRESSED (MNR)
-  RAILWAY (NRVIS)
-  DRAINAGE-NETWORK (GRCA)
-  FLOODPLAIN (GRCA)
-  ENGINEERED
-  APPROXIMATE
-  ESTIMATED
-  REGULATION LIMIT (GRCA)
-  DRAINAGE-POLY (NRVIS)
-  2015 ORTHO (ONT)

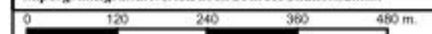


**GRCA Disclaimer**

This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to:

<http://grims.grandriver.ca/docs/SourcesCitations2.htm>



NAD 1983, UTM Zone 17

Scale 1:10,075



### Speed R Regulatory Limits

**LEGEND**

-  WATERSHED BOUNDARY (GRCA)
-  UTILITY LINE (NRVIS)
-  ROADS-ADDRESSED (MNR)
-  RAILWAY (NRVIS)
-  DRAINAGE-NETWORK (GRCA)
-  FLOODPLAIN (GRCA)
-  ENGINEERED
-  APPROXIMATE
-  ESTIMATED
-  REGULATION LIMIT (GRCA)
-  DRAINAGE-POLY (NRVIS)
-  2015 ORTHO (ONT)

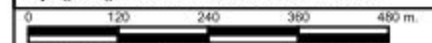


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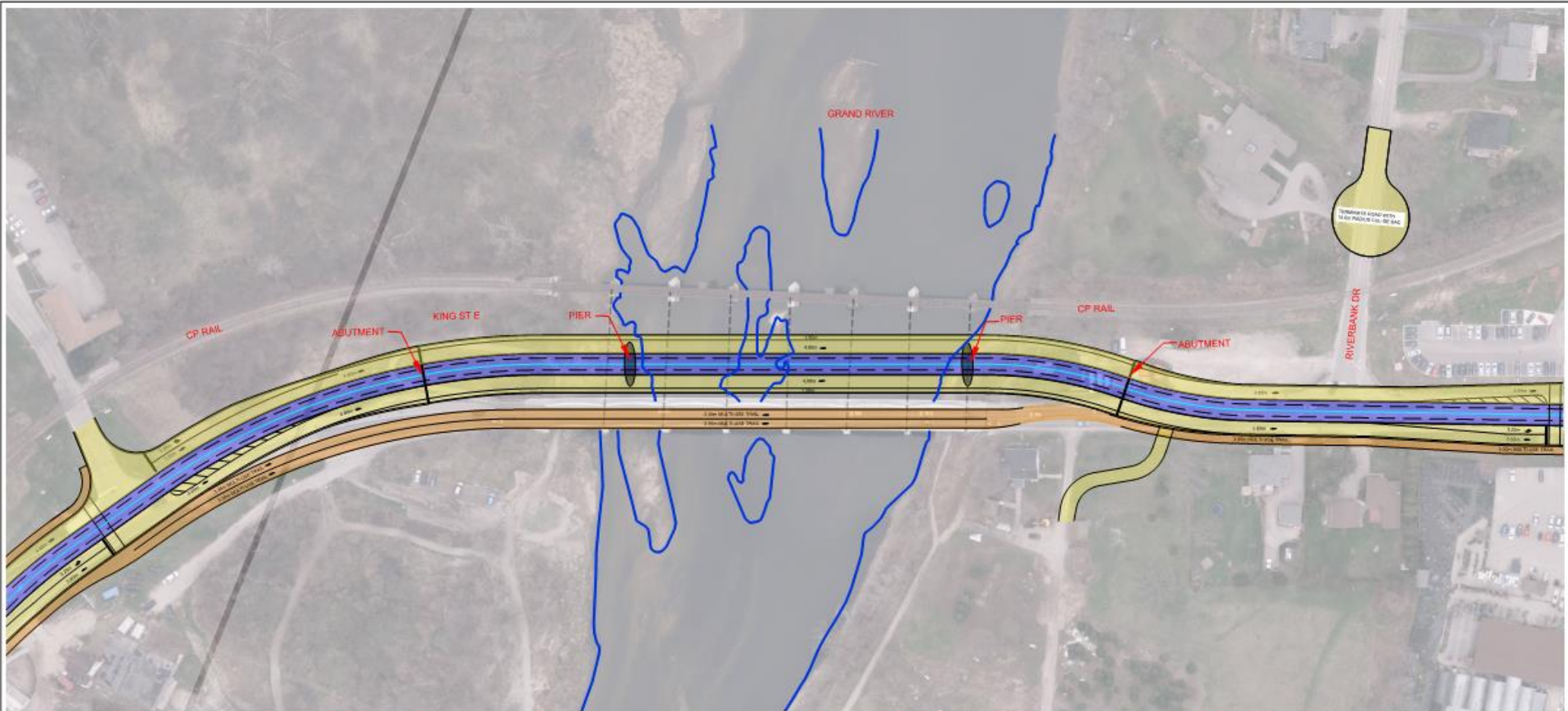


NAD 1983, UTM Zone 17

Scale 1:10,075



# PLAN VIEW GRAND RIVER CROSSING – OPTION 1

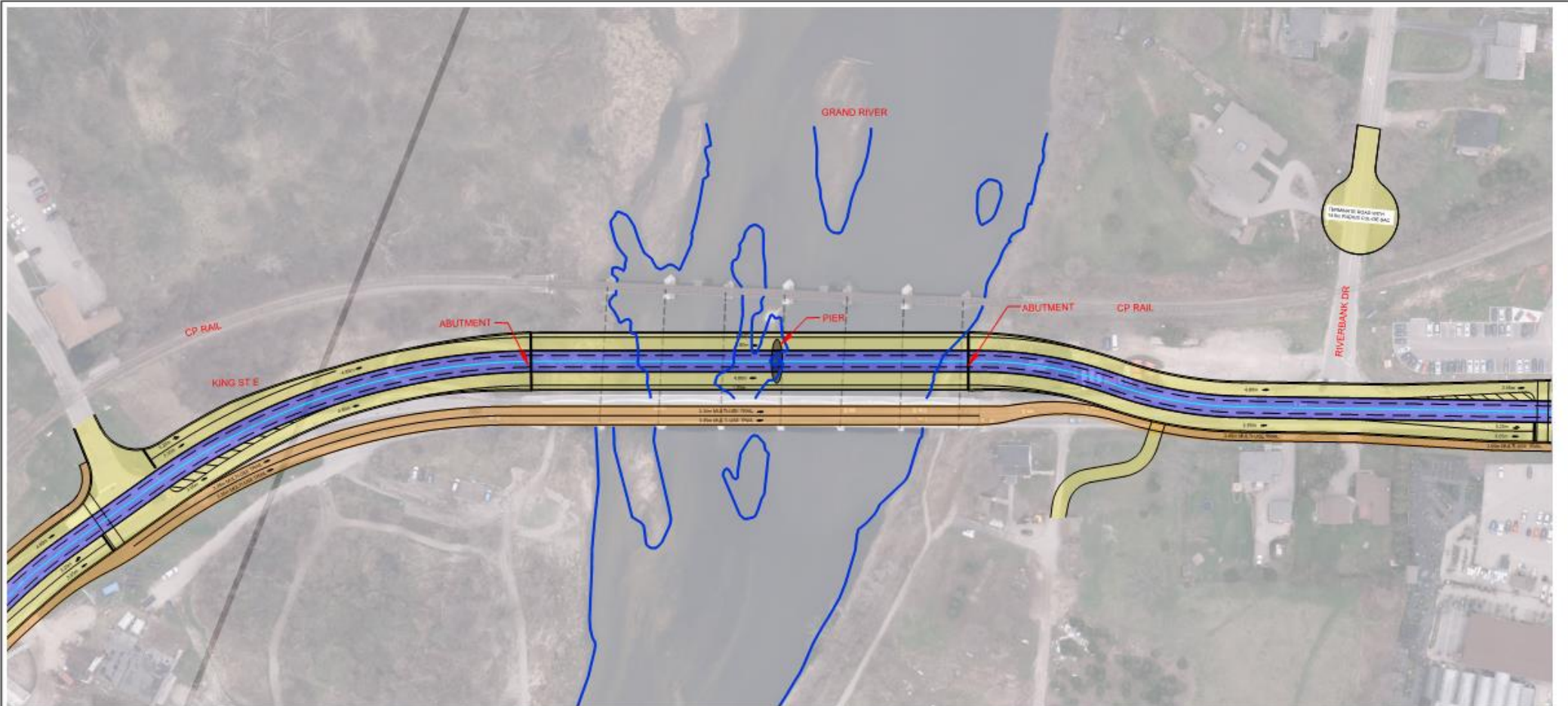


LEGEND	
LET PLAZA	
LET RAMP TRAVEL	
PROPOSED TRAFFIC LANES	
PROPOSED ONE WAY	
EXISTING R/W	
PROPOSED SIDEWALK	
PLAZA/PAV	



CONCEPTUAL DESIGN	151-07859
STAGE 2 150V LIGHT RAIL TRANSIT (LRT) FROM BRIDGEMAN TO CAMBRIE TRANSIT PROJECT ASSESSMENT (TPA) PROCESS	XX
	XX-XXX

# PLAN VIEW GRAND RIVER CROSSING-OPTION 2

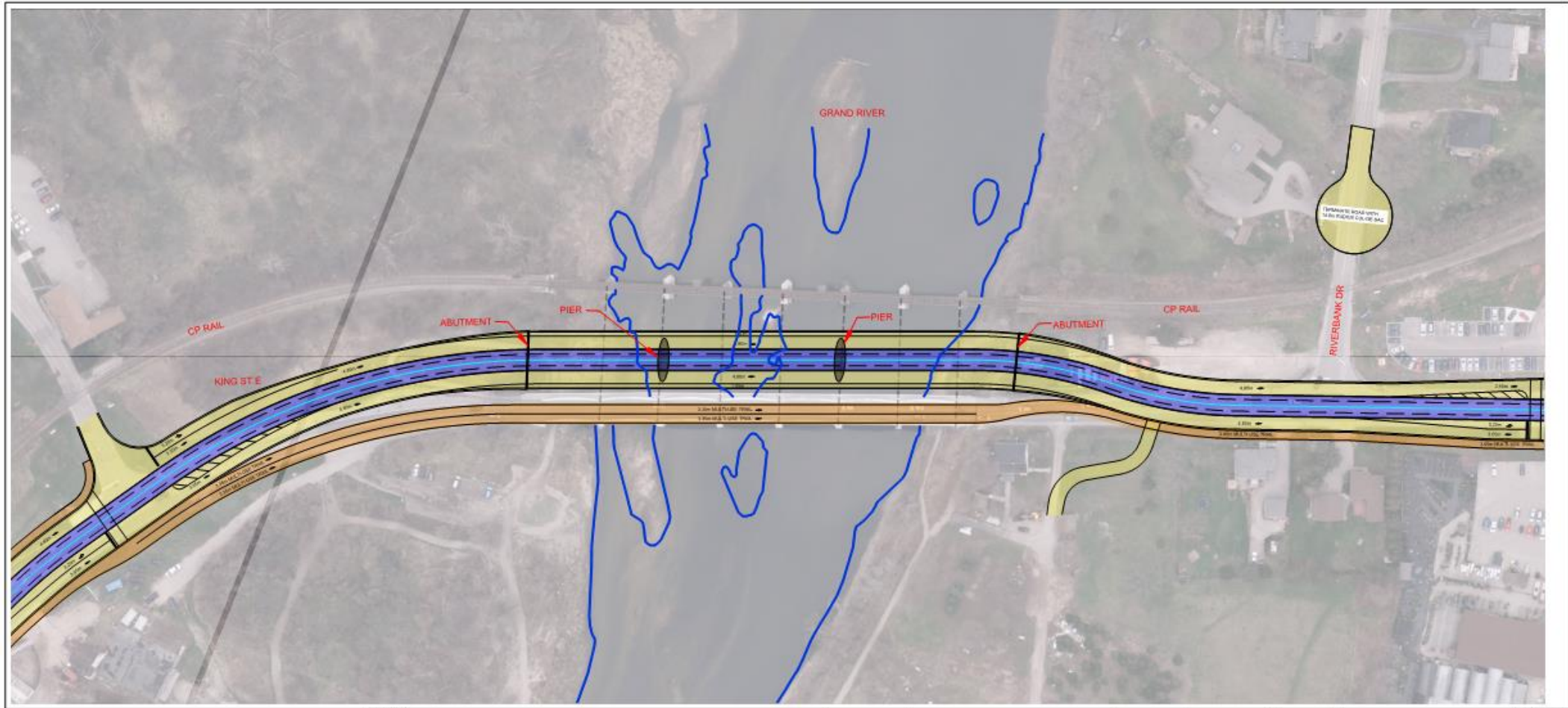


LEGEND	
LET FLOORING	
LET ROAD TRAVEL	
PROPOSED TRAFFIC LANES	
PROPOSED SIDE LANE	
EXISTING R/W	
PROPOSED SIDEWALK	
FLOORPLAN	



CONCEPTUAL DESIGN	151-07859
STAGE 2 10% LIGHT RAIL TRANSIT (LRT) FROM ORIGINATOR TO CHAIRMAN'S TRANSIT PROJECT ASSESSMENT (TPA) PROCESS	XX
	XX-XXX

# PLAN VIEW GRAND RIVER CROSSING-OPTION 3

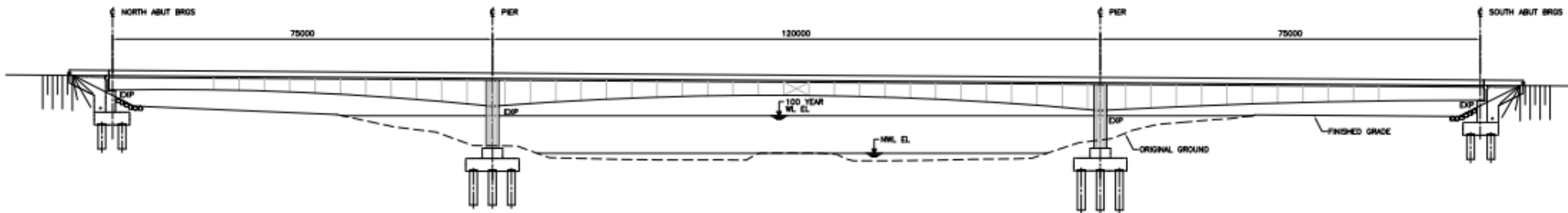


LEGEND	
LRT PLATFORM	
LRT RAMP TRANSIT	
PROPOSED TRAFFIC LANE	
PROPOSED BIKELANE	
EXISTING SIDEWALK	
PROPOSED SIDEWALK	
FLOODPLAIN	

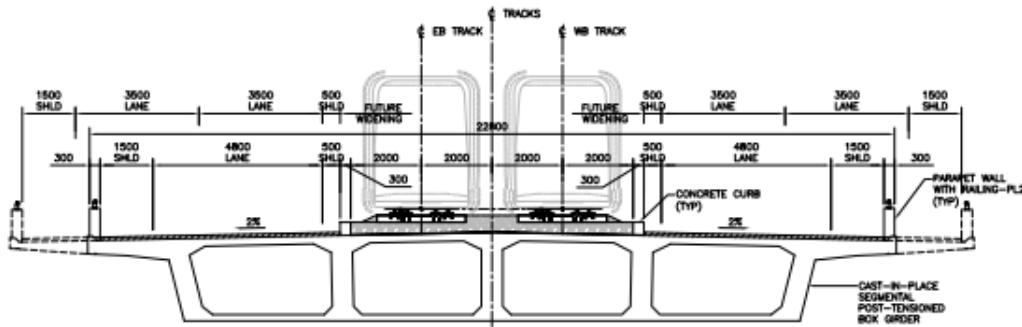


SCALE	CONCEPTUAL DESIGN	PROJECT NO. 151-07859
	STAGE 2 2 KM LIGHT RAIL TRANSIT (LRT) FROM BIRCHMOUNT TO COMMERCE TRAVEL PROJECT ASSESSMENT (TPA) PROCESS	DATE XX-XX-XX

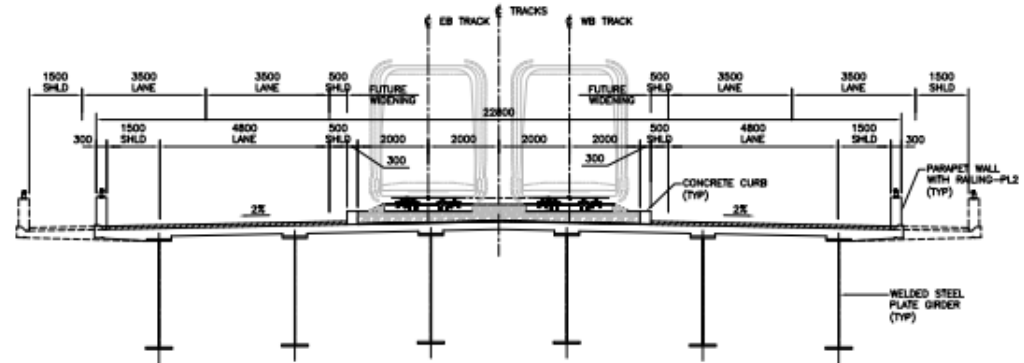
# GRAND RIVER CROSSING-OPTION 1



ELEVATION - OPTION 1  
1:400

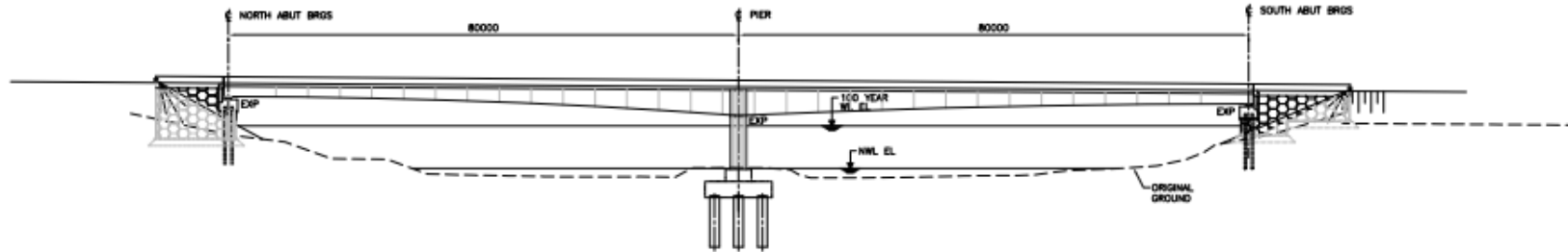


CROSS SECTION - TYPE '1A'  
1:75

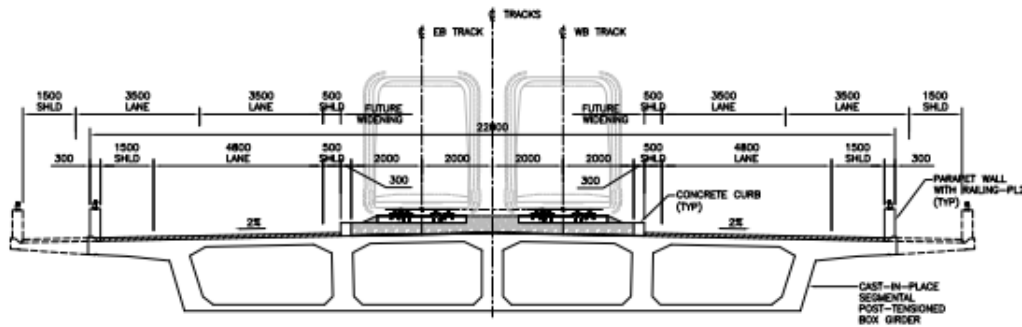


CROSS SECTION - TYPE '1B'  
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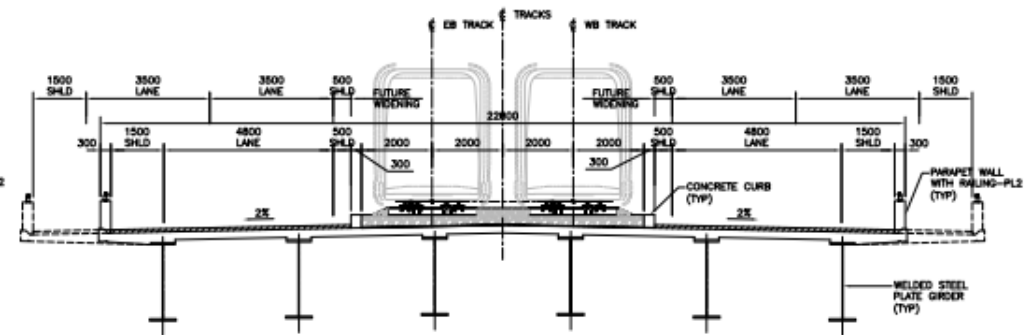
# GRAND RIVER CROSSING-OPTION 2



ELEVATION - OPTION 2  
1/400

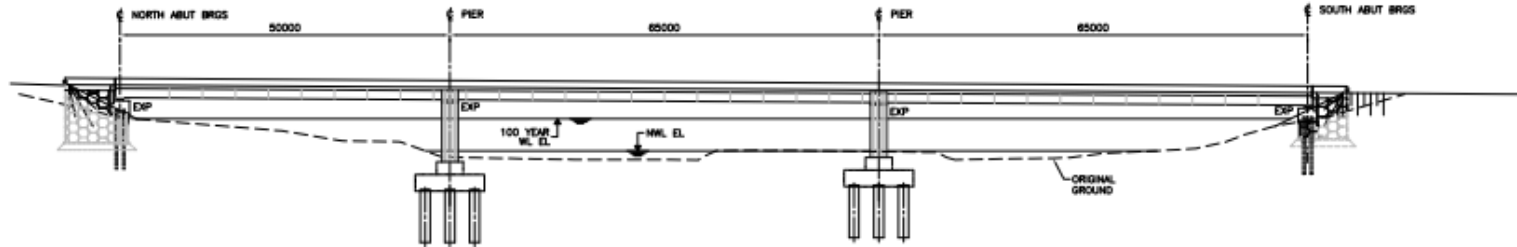


CROSS SECTION - TYPE '2A'  
1/75

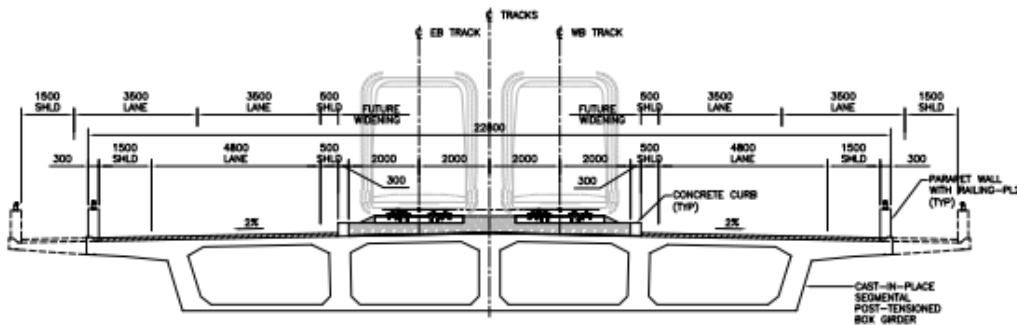


CROSS SECTION - TYPE '2B'  
1/75

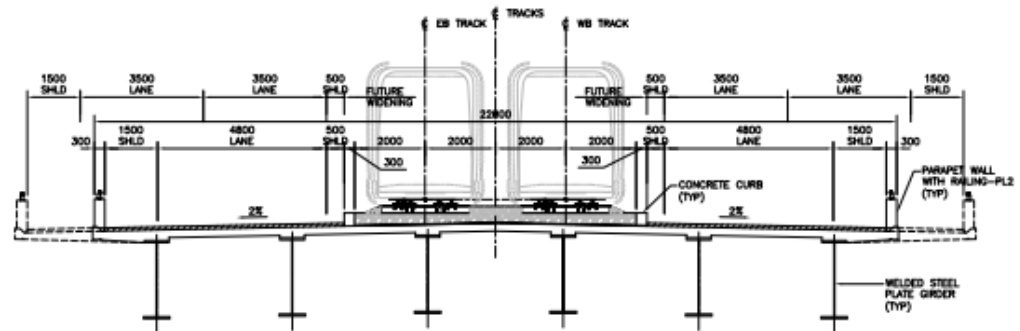
# GRAND RIVER CROSSING-OPTION 3



ELEVATION — OPTION 3  
1:100



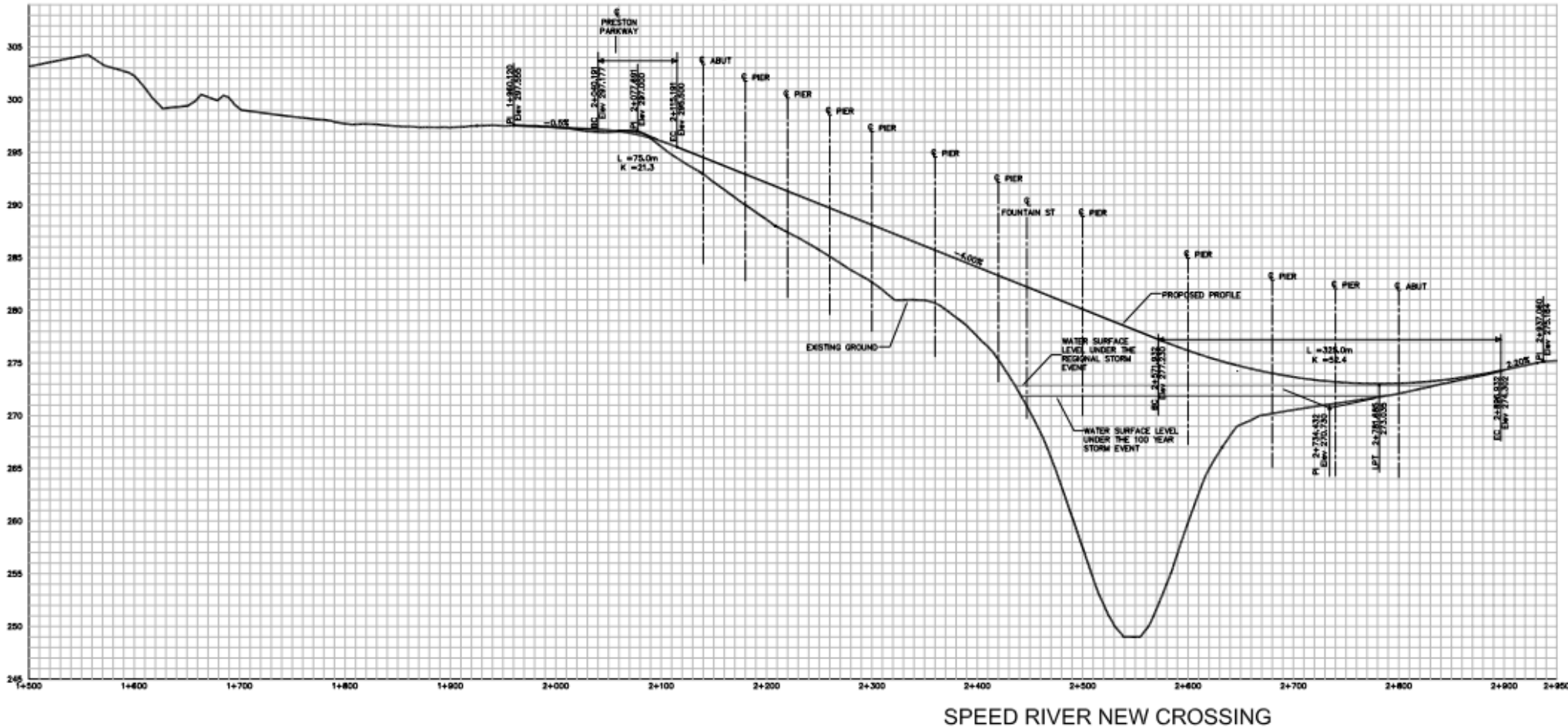
CROSS SECTION — TYPE '3A'  
1:75



CROSS SECTION — TYPE '3B'  
1:75

# DESIGN ALTERNATIVES SPEED RIVER

Alignment – Shantz Hill



## DISCUSSION AND NEXT STEPS

- **Field program for additional data and information**
  - **Species at Risk targeted survey**
  - **Modified Species at Risk Mapping**
  
- **Additional consultation with environmental agencies**

# DISCUSSION AND NEXT STEPS

## MEETING NOTES – Ministry of Transportation (MTO)

### Meeting No. 3

<b>PROJECT</b>	Region of Waterloo – Stage 2 LRT TPA Process
<b>OBJECTIVE</b>	To present a proposed new alternative for the project on Highway 8, and receive MTO's feedback
<b>DATE / TIME</b>	February 28, 2017, 9:30am
<b>LOCATION</b>	Ministry of Transportation, West Region 659 Exeter Road, London
<b>PROJECT No.</b>	161-07859-00

<b>Attendees</b>	<b>Organization</b>	<b>e-mail</b>
Scott Howard	MTO – Planning & Design	scott.howard@ontario.ca
Martin Haalstra	MTO – Structural	martin.haalstra@ontario.ca
Carmen DeLeon	MTO – Traffic	carmen.deleonmorillo@ontario.ca
Dave Secord	MTO – Corridor Management	david.secord@ontario.ca
Roger Ward	MTO – Planning & Design	roger.ward@ontario.ca
Martin Favell	MTO – Planning & Design	martin.favell@ontario.ca
Geddes Mahabir	MTO – Planning & Design	geddes.mahabir@ontario.ca
Paula Sawicki	Region of Waterloo	psawicki@regionofwaterloo.ca
Matthew O'Neil	Region of Waterloo	moneil@regionofwaterloo.ca
Eric Peissel	WSP	eric.peissel@wspgroup.com
Denise Morneau	WSP	morneaud@mmm.ca
Sarah Roberts	WSP	sarah.roberts@wspgroup.com
Maged Ibrahim	WSP	ibrahimm@mmm.ca

**Item:**

RMW and WSP provided a brief presentation with an overview of the concept for a proposed LRT route alternative running along the Hwy 8 median between River Road and King St. These notes summarize the discussion points and action items. The presentation slides are appended for reference.

**1. Design – Hwy 8 Typical Section**

- 1.1. A concept plan and typical section for Hwy 8 showing the proposed LRT running in the median was reviewed. WSP indicated that the existing highway platform could accommodate a lane shift such that the width of the LRT structure would not overhang the travelled lanes. This would be accomplished with a small widening of the median shoulders. MTO indicated that, with proper vertical clearance, overhanging of the structure may not be an issue.
- 1.2. RMW highlighted that the wider outside bus by-pass shoulders, which were constructed at the Region's cost, would no longer be needed for that purpose, and thus the extra width can be utilized to accommodate the lane shifts noted above.
- 1.3. WSP indicated that the lane shift would require a crown shift where the cross-section is on tangent. MTO advised WSP to ensure any impacts from the crown shift on existing retaining walls are accounted for. Other impacts to be

**Action by:**

WSP

Item:	Action by:
<p>aware of include those on barrier walls and drainage systems.</p> <p>1.4. WSP described how the LRT corridor would connect to the Preliminary Preferred Alternative in the vicinity of the River Road and King Street interchanges, highlighting that the ramp operations would not be affected.</p> <p><b>2. Design – Grand River Structures</b></p> <p>2.1. WSP presented an option for affixing the LRT structure piers to the piers of the two existing Hwy 8 Grand River structures across the Grand River to reduce the impact on the Grand River. The proposed LRT piers would tie the the piers of each separate structure together. WSP advised that this was a high level concept and that additional information on the existing structures and piers is required to determine the feasibility of this option.</p> <p>2.2. MTO advised that the two existing Hwy 8 Grand River structures were specifically designed to be separate structures, as they are at different stages in their service lives (one structure built recently, the other built in the 1950’s) and have different foundation types (one on piles, the other on spread footings). The concern with the service life compatibility issues is that in some number of years when one structure must be demolished, the LRT structure would also have to be demolished.</p> <p>2.3. MTO noted their preference for the LRT structure piers over the Grand River to be offset from the existing Hwy 8 structure piers. Having offset piers would also prevent the LRT and highway structures from being joined, which would alleviate some concerns of having Region and MTO infrastructure physically tied together. It was agreed that further analysis of the constructability of an independent LRT structure is required, following which the span lengths can be optimized to limit the number of LRT piers in the water.</p> <p>2.4. MTO expressed concern that having an LRT structure in the median over the Grand River would create obstacles to access for inspection/maintenance of the existing Hwy 8 structures.</p>	<p>WSP</p>
<p><b>3. Design – General</b></p> <p>3.1. MTO sees a number of issues with the proposed LRT crossing of Hwy 8 at River Road, and acknowledges that a route along Hwy 8 would eliminate those issues.</p> <p>3.2. MTO advised that they would need to see more documentation as to why an LRT corridor east or west of the MTO corridor is not feasible before they would consider a Hwy 8 median running alternative.</p> <p>3.3. MTO indicated that they would be willing to consider an LRT corridor closer than the previously required 14m offset from the MTO right-of-way. MTO noted that it is not anticipated that Hwy 8 will need to be widened further. However, any LRT concept parallel to Hwy 8 would need to, as a minimum, accommodate widening by one additional lane without any additional cost/encumbrance to MTO, absent the LRT. It was agreed that the provisions for widening should be consistent with that being incorporated at the new River Road interchange. WSP will review this with the River Road design team. MTO will discuss this further internally, advise RMW and WSP of the required offset from existing full-depth shoulder, and confirm the widening requirement.</p>	<p>WSP</p> <p>WSP MTO</p>

Item:	Action by:
3.4. The elevation of the LRT corridor running parallel to the Hwy 8 corridor was discussed. MTO will consider whether the vertical clearance requirement for a parallel structure which overhangs the travelled portion of the highway should be the same as for a crossing structure. FHWA has studied this issue (e.g. HOV lanes, HOT lanes). WSP to compile research on this.	MTO  WSP
<b>4. Next Steps</b>	
4.1. MTO will provide CAD files for the most recent Hwy 8 contract, along with drawings for the Grand River structures and the existing ground digital terrain model, to enable WSP to advance the concept design.	MTO
4.2. RMW/WSP will investigate the option of running the LRT corridor on the west side of the Hwy 8 right-of-way.	RMW/WSP
4.3. MTO will provide the required offset of LRT corridor from the edge of the existing Hwy 8 shoulder and confirm whether provision should be made for an additional lane of widening.	MTO
4.4. MTO will provide vertical clearance required for parallel running structures.	MTO



# STAGE 2 ION LRT TRANSIT PROJECT ASSESSMENT

## MTO MEETING NO. 3

*FEBRUARY 28, 2017*



**PARSONS  
BRINCKERHOFF**

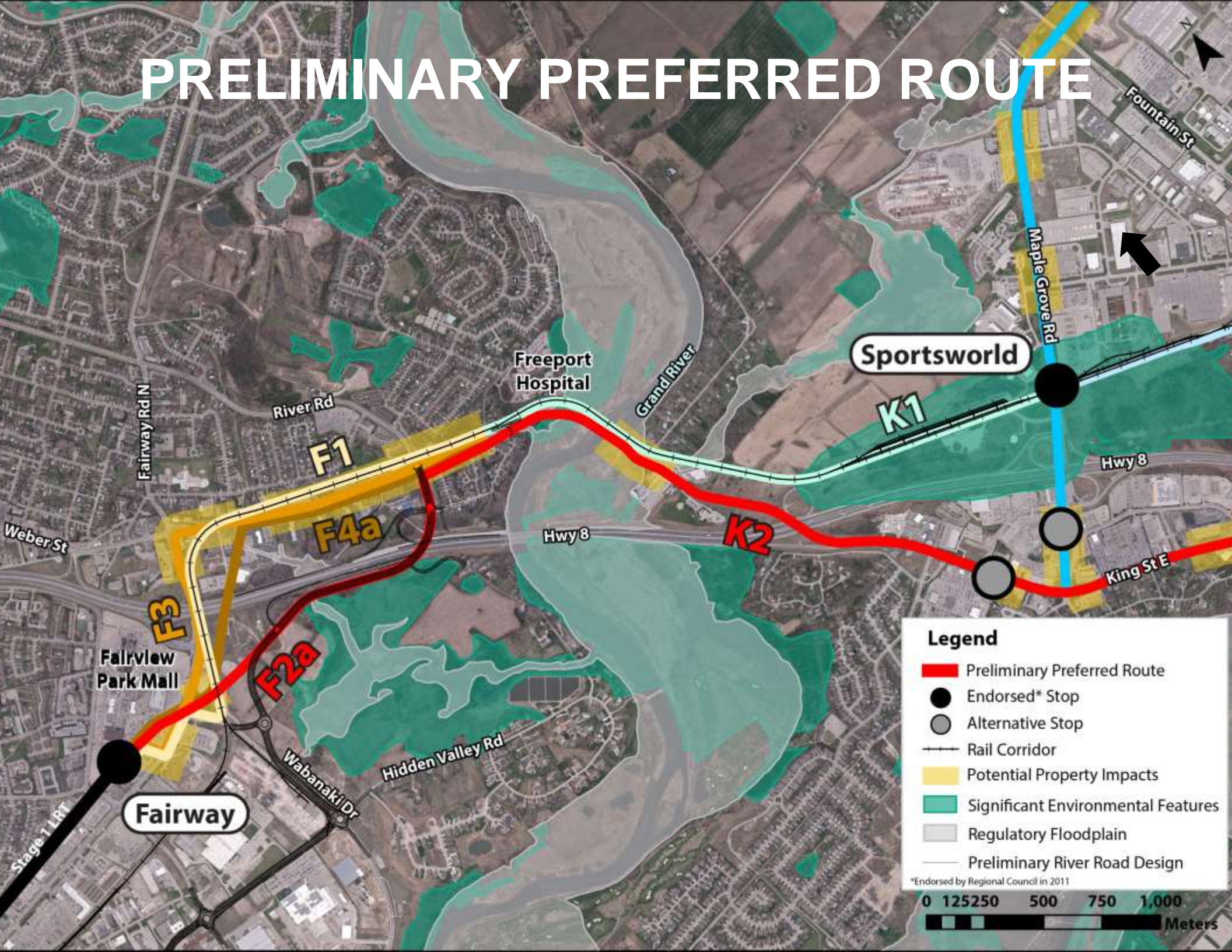
# MEETING AGENDA

- 1. Presentation of proposed new alternative**
- 2. Discussion and Feedback**
- 3. Next Steps**

# STUDY STATUS

- Identification and evaluation of route and station alternatives carried out in Spring-Summer 2016
- Preliminary preferred route presented to TAC in August 2016
- Public consultation planned for Fall 2016 was deferred; now currently underway (Feb 23 and 28, March 1)
- After PCCs, preliminary design will resume, including:
  - Impact assessment including any further engineering analysis, and mitigation design
  - Travel demand modelling and ridership estimates
  - Traffic operations analysis at intersections, including MTO ramps
  - Site selection for Maintenance and Operations Facility and TPSS
  - Property requirements identification
  - Consultation with TAC (next meeting – March 27), public
  - Documentation and TPA process

# PRELIMINARY PREFERRED ROUTE



Fairway

Sportsworld

Freeport Hospital

Fairway Rd N

River Rd

Grand River

Maple Grove Rd

Fountain St

F1

K1

Hwy 8

Weber St

F4a

Hwy 8

K2

King St E

F3

Fairview Park Mall

F2a

Hidden Valley Rd

Wabanaki Dr

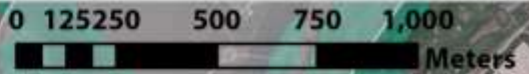
Fairway

Stage 1 LRT

## Legend

- Red line: Preliminary Preferred Route
- Black circle: Endorsed\* Stop
- Grey circle: Alternative Stop
- Black line with cross-ticks: Rail Corridor
- Yellow shaded area: Potential Property Impacts
- Green shaded area: Significant Environmental Features
- Grey shaded area: Regulatory Floodplain
- Thin grey line: Preliminary River Road Design

\*Endorsed by Regional Council in 2011



# EVALUATION FINDINGS

**F2a and K2 were preferred for the following key reasons:**

- **Substantially avoids the CP corridor**
- **Reduced property impacts**
- **Minimizes impact on Hydro corridor**
- **Reduced capital and operating costs**
- **Relatively lower impacts on traffic operations**

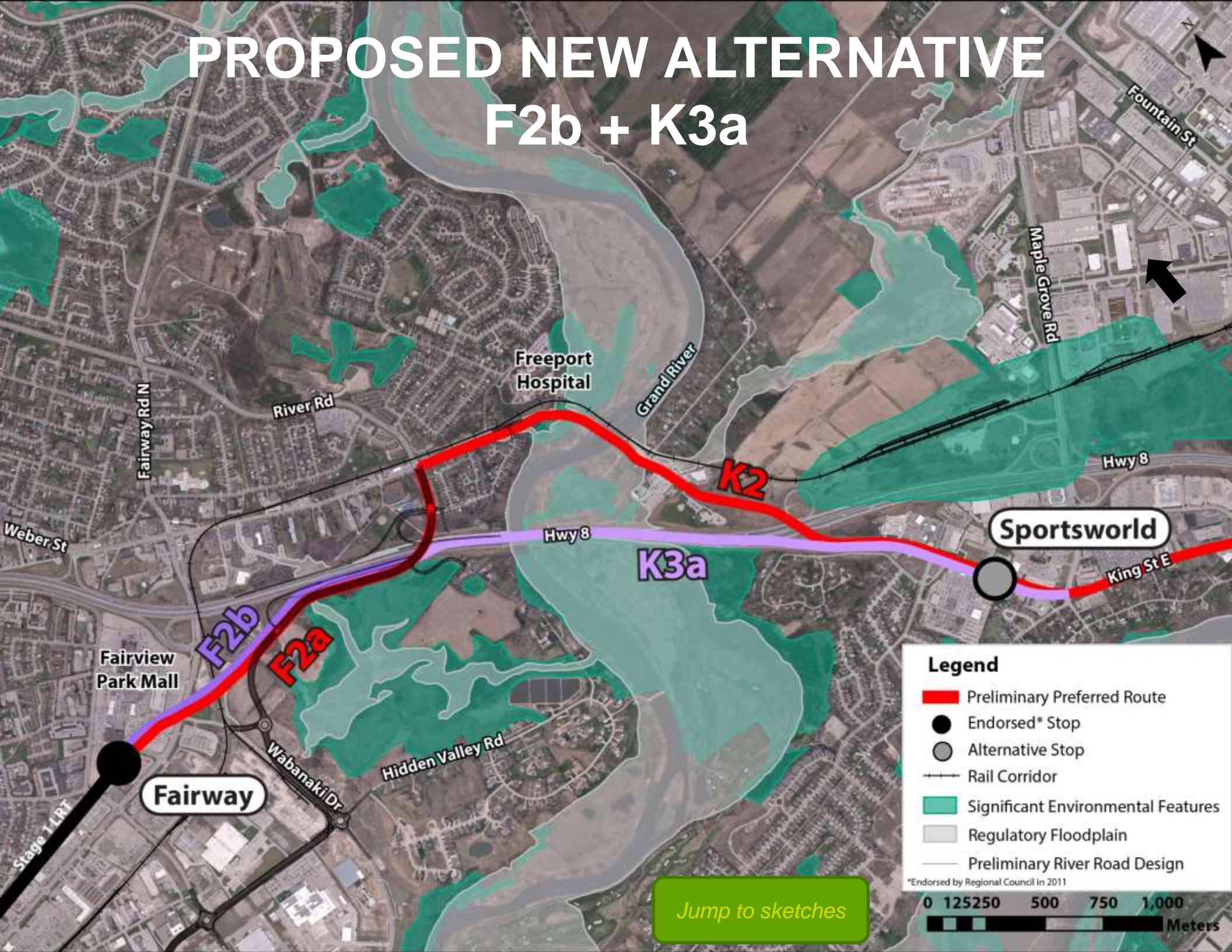
**Key trade-offs include:**

- **Environmental impacts and First Nation interests with new Grand River crossing**
- **Relatively higher travel time**
- **Need for more complex bridge design for River Road over Highway 8**

# REQUEST TO EXAMINE HIGHWAY 8 CORRIDOR

- **Determined that alignment along west side of highway had significant environmental impacts**
- **Determined that alignment along east side would have significant impacts on Hydro Corridor**
- **LRT on west or east of Highway 8 hampers ability to widen Highway 8 in future**
- **Centre running within Highway 8 was found to be a promising alternative**

# PROPOSED NEW ALTERNATIVE F2b + K3a



[Jump to sketches](#)

## ADVANTAGES OF F2b + K3a

- Avoids a new crossing of the Grand River
- Reduces one-way travel time by 1m31s (6%) and distance by 644m
- Avoids property takings along King Street
- Minimizes any potential traffic operations impacts on River Road and King Street (including Highway 8 ramps)
- Maximizes the Region's previous investment in transit infrastructure on Highway 8 and MTO's policy of promoting and developing integrated transit solutions

**F2b+K3a maintains MTO design standards on Highway 8 and preserves the ability for future widening**

# EXAMPLES FROM OTHER JURISDICTIONS

**The following slides show photos of median elevated LRT or commuter rail systems in freeway/highway corridors, from other Canadian or US cities**

# WEST LRT – CALGARY



# CANADA LINE – VANCOUVER



Pinetreecreative

# AIR TRAIN – NEW YORK CITY



# METRORAIL – WASHINGTON, DC



# LINK LRT – SEATTLE



# BART – SAN FRANCISCO



# METRORAIL – MIAMI



# MTO SUSTAINABILITY STRATEGY AND IMPLEMENTATION PLAN

- **Top priorities include:**
  - Increasing transit ridership
  - Promoting multimodal transportation network
- **Commitments include:**
  - Investing in public transit across Ontario
  - Better integrating transportation and land-use planning in support of sustainable transportation choices
  - Assisting in reducing greenhouse gas emissions for commercial vehicles
- **Example of recent MTO transportation planning initiative:**
  - Using “building block” approach to improving transportation network ie. optimizing existing network, then incorporating non-roadway improvements before considering widening existing roads or providing new ones

# ISSUES REQUIRING FURTHER ASSESSMENT

- **Structure analysis of Highway 8/Grand River bridges to verify feasibility of bridge modifications**
- **LRT snow/ice and drainage management**
- **Highway drainage design**
- **Impacts to existing HML and how to replace**
- **Impacts to 2 overhead signs and how to replace**
- **Roadside protection**
- **Construction staging for elevated LRT**
- **Staging for future Highway 8 rehabilitation or widening**
- **Emergency access and maintenance practices**
- **Agreements required:**
  - **Construction access (likely AFP delivery)**
  - **Operation and emergency access**
  - **Maintenance obligations**
  - **Right-of-way and bridge ownership**

## DISCUSSION

- Initial thoughts on proposed alternative
- Next steps re MTO review process and reporting back

## NEXT STEPS

**If this alternative is carried forward:**

- **Obtain as-built or construction drawings from MTO for Highway 8 and Grand River bridges and refine concept**
- **Evaluate against Preliminary Preferred Alternative F2a+K2 using same criteria**
- **Resolve issues requiring further assessment**
- **If selected as the Preferred Alternative:**
  - **Complete preliminary design, including further meetings with MTO**
  - **PCC No. 3 in Fall 2017**
  - **Complete TPA Process**
  - **Initiate discussion on legal agreements**