Region of Waterloo

Transportation Services

Rapid Transit

To: Planning and Works Committee

Meeting Date: April 4, 2023

Report Title: Stage 2 ION Project Status Update

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1. Recommendation

That the Regional Municipality of Waterloo direct staff to include three project alternatives within the Stage 2 ION business case as described in report TSD-RTS-23-001 dated April 4, 2023.

2. Purpose / Issue:

The purpose of this Report is to update Council on the Stage 2 ION project, specifically:

- status and timing of the south terminus re-evaluation;
- updated cost estimates;
- timing of the business case; and,
- next steps toward a funding request.

3. Strategic Plan:

The Stage 2 ION project supports the 2019-2023 Corporate Strategic Plan Sustainable Transportation Objective 2.1: Enhance the transit system to increase ridership and ensure it is accessible and appealing to the public, and Sustainable Transportation Action 2.1.3: Complete the detailed planning for Stage 2 ION.

4. Report Highlights:

- Three alternatives are proposed for the Stage 2 ION Initial Business Case, terminating at Pinebush Station (Alternative A), at the Delta Station (Alternative B) or the Council-endorsed full length to Downtown Cambridge (Alternative C).

- The escalated capital costs are now estimated as follows:

($ millions, escalated)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown
Total Escalated Capital Cost	$2,901	$3,929	$4,463

- The updated property and property-related costs are as follows:

($ millions, 2022$)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown
Property and related costs	$125	$165	$200

- The updated operations, maintenance and rehabilitation (O&M+R) costs are.

($ millions, 2022$)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown
Total Annualized O&M+R Costs	$9.4	$18.8	$22.6

- A light rail transit (LRT) system's average daily ridership between Fairway station and Downtown Cambridge station is estimated to reach between 10,000 and 15,000 by 2051.

- The Region has retained a consultant to complete the south terminus re-evaluation. The preferred terminus location will be identified by summer 2023.

5. Background:

Route Evaluation and Selection

In June 2011, Regional Council approved a staged approach to LRT from Waterloo to Cambridge. The Kitchener to Cambridge Stage 2 LRT alignment and station locations were endorsed by Council as part of the initial work done on Stage 1 LRT.

The pre-planning activities for the Stage 2 TPA Process commenced in 2015, including various technical and environmental studies and investigations, as well as public engagement. Since 2015 there have been five rounds of public consultation and 15 in-person, drop-in style public consultation centres (PCCs).

In June 2019, Regional Council endorsed a final Preferred Route and station locations (Appendix A) for the Stage 2 ION project. In April 2020 Region of Waterloo Council endorsed the preliminary design and directed staff to commence the transit project assessment process (TPAP).

Transit Project Assessment Process (TPAP)

The Stage 2 ION project followed the TPAP, a streamlined process for transit projects under the Environmental Assessments Act, which can be completed within six months. The TPAP includes opportunities for public involvement and input. It is focused on matters of "provincial importance" and "constitutionally protected Aboriginal or treaty rights." The TPAP commenced in December 2020, and was completed in June 2021. The Environmental Project Report (EPR) includes a description of the project, potential

impacts, mitigation measures, consultation and engagement process. Appended to the EPR are all of the relevant technical reports as well as the function design drawings. The EPR is available on the project website at www.regionofwaterloo.ca/stage2ION.

Project Alternatives

The Ministry of Transportation expects that the business case will include alternatives for comparison, not just a single project design. Alternatives can include, for example, technology (e.g. bus rapid transit versus light rail transit), location within the road allowance (e.g. side-running vs. centre-running), or level of priority (e.g. exclusive lanes vs. mixed traffic). Three alternative lengths of LRT will be considered for the Stage 2 ION business case:

A. Alternative A – from Fairway Station to Pinebush Station
B. Alternative B – from Fairway Station to Delta Station
C. Alternative C – from Fairway Station to Downtown Cambridge (full length)

All three alternatives include a new light maintenance and storage facility in Cambridge.

Project Benefits and Ridership Forecasts

Rapid transit is about providing a fast, reliable way to travel around our urban areas for work, shopping and entertainment. It gives people more choice about how they move around the Region and increases their ability to travel without always needing a personal vehicle. With more than 200,000 new residents expected to move to Waterloo Region over the next 20 years, LRT is a sustainable solution to meet our community's future transportation needs.

Rapid transit encourages more residential and commercial development in our existing urban areas. This type of development helps limit urban sprawl, reducing pressure on Waterloo Region's precious farmland and groundwater sources. Over 50 per cent of new development in Waterloo Region is happening in the existing urban areas, adding more residents and generating more jobs in our urban areas. Without intensification, the Region would need to plan for significant expansion of the road network through existing, mature residential neighbourhoods.

With travel time savings and frequent and reliable service, LRT will contribute to meeting the Region's mode shift targets. Stage 2 ION will expand the Region's rapid transit network, complete the connection between the Region's three city centres, and make fast and frequent transit accessible to more residents, jobs and destinations. It will leverage other existing, planned or contemplated Regional and Provincial transit services and investments such as the potential GO train service at Pinebush Station, GO Bus service at Sportsworld Station, Stage 1 LRT and major bus routes at Fairway Station, and GO train service at the King-Victoria Transit Hub.

An LRT ridership forecast to 2051 will be developed as part of the business case using

a travel demand model. Many of the economic, social and health benefits of LRT are based on total ridership and new riders. In advance of having a final 2051 travel demand model, staff estimate LRT average daily ridership between Fairway station and Downtown Cambridge station to reach between 10,000 and 15,000 by 2051.

Business Case

The business case is a document that summarizes and details the capital and lifecycle costs compared to various quantitative and qualitative benefits of the Stage 2 ION LRT extension project. It will be the primary document supporting the Region's decision-making process and, ultimately, funding requests. The business case will be reviewed by Ministry of Transportation (MTO) policy offices. It will generally follow the Metrolinx business case guidance covering elements of an "Initial Business Case".

The business case is divided into four major sub-cases:

- Strategic Case—Determines the value of addressing a problem or opportunity based on regional development goals, plans or policies;
- Economic Case—Assesses the economic costs and benefits of the project to individuals and society as a whole, and spans the entire project's lifecycle;
- Financial Case—Assesses the overall financial impact of the project, its funding arrangements and technical accounting issues, financial value for money with a focus on capital, operating, and revenue impacts and risks;
- Deliverability and Operations Case—Considers procurement strategies, deliverability risks, and operating plans and risks.

The Region must now retain a consultant to complete the Initial Business Case (IBC). A request for proposals can be issued in fall 2023 and the IBC completed by late 2024. The IBC is estimated to cost $500,000 including travel demand model updates to 2051.

South Terminus Re-evaluation

The Region undertook an evaluation process for the south terminus which concluded in 2018 with Council endorsement of the stations at Main Street and on Bruce Street.

The Region now has new information, based on experience operating an LRT system and based on a Bruce Street terminus design which has been developed further. Some benefits of the endorsed location have not been realized, the impacts and costs have increased, and additional benefits of the Ainslie site have been uncovered, as described in report TES-RTS-22-01 dated August 9, 2022.

Taken together, the new information warrants a formal re-evaluation of the terminus location to confirm maximum value for the Region and for the public.

The Region has now retained a consultant to facilitate re-evaluation of the south terminus. All three original alternative locations will be considered: T1 (Ainslie Terminal),

T2 (Bruce) and T3 (Concession). The evaluation of alternative locations is anticipated to be completed by summer 2023, with the functional design completed by fall 2023.

Cost Estimate - Capital

The Region has retained specialized cost consultants to estimate the property, capital, operations, maintenance and rehabilitation (life-cycle) costs for the Stage 2 ION project. A Class 4 capital cost estimate was completed based on a 5-10% design and has an estimate range of -20%/+50%. The estimated capital costs for each of alternatives are:

CAPITAL COST ESTIMATE ($millions)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown
Project Costs (2022$)	$1,787	$2,400	$2,721
Cost Escalation	630	874	998
Contingency (20%)	483	655	744
Total Escalated Cost	**$2,901**	**$3,929**	**$4,463**

The capital costs above include infrastructure, vehicles, property, owner's costs and an allowance for estimating uncertainty based on a risk-based analysis. For the purpose of calculating cost escalation it was assumed that construction will occur from 2030 to 2035. The project contingency is based on federal guidance for this level of design and class of cost estimate. "Owner's costs" includes project development, engineering, procurement, project, commercial and design management, as well as commissioning.

The above estimate does not include financing costs and does not consider the cost and/or risk impacts of sole-sourcing the work. It also does not include costs for local bus fleet expansion that would be required to support the LRT system.

The capital costs for Stage 2 ION, on a per-kilometre basis, are significantly higher than those of Stage 1 for several reasons. Stage 1 was procured in 2014 and constructed mostly in 2014-2017. Stage 1 capital costs of $868 million were funded by Canada ($265 million), Ontario ($325 million), and the Region ($278 million), of which $131 million was financed through GrandLinq. The current Stage 2 cost estimate uses updated benchmarks from across the industry, and costs for all LRT projects in Ontario and across Canada have increased significantly in the last 10 years. Stage 2 ION has six new major bridges, grade separations and/or elevated sections whereas Stage 1 had none. The current cost estimate is generally consistent with the capital costs of other contemporary LRT projects in Ontario.

Cost Estimate – Property

The capital cost estimate above includes property and property-related costs as follows:

PROPERTY COSTS ($ millions)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown

Property (2022$)	$125	$165	$200

The above costs are for real property and property-related costs, such as appraisals, transaction costs, business relocation, injurious affection and legal costs. The above estimate is based on the market value of property as of 2022 and does not include future appreciation in property value.

Property and related costs would not be eligible for cost-sharing under any potential funding agreement with the federal or provincial government. The Region would be responsible to fully fund all property-related costs for the project.

Cost Estimate – Operations, Maintenance and Rehabilitation (O&M+R)

The Region has retained a consultant to conduct an analysis of the Stage 2 ION LRT operations and develop a cost estimate for on-going system operations, maintenance and rehabilitation (also known as “life-cycle”) costs. The

ANNUALIZED O&M+R COSTS ($000,000s, 2022$)	A – Fairway to Pinebush	B – Fairway to Delta	C – Fairway to Downtown
Operations and Maintenance			
Admin & Management	$1.3	$2.8	$3.4
Operations	2.7	5.0	6.2
Infrastructure Maintenance	1.9	2.5	3.0
Vehicle Maintenance	0.7	3.6	4.3
Energy	0.2	1.4	1.7
Sub-total O&M Costs	$6.8	$15.3	$18.6
Rehabilitation (life-cycle)			
Infrastructure Rehabilitation	1.8	2.4	2.7
Vehicle Rehabilitation	0.8	1.1	1.3
Sub-Total Rehabilitation Costs	2.6	3.5	4.0
Total Annualized O&M+R Costs	**$9.4**	**$18.8**	**$22.6**

The above cost estimate is in 2022$ and does not include cost escalation or inflation. Costs have been averaged out on an annual basis because costs will vary over the contract period and rehabilitation only occurs periodically.

Funding

Funding sources for Stage 2 ION have not yet been identified. The Region’s capital budget includes amounts for construction of Stage 2 ION and assumes that full funding will be obtained from upper levels of government for capital costs. Through the cost estimating process it has become clear that the Region must advance the design and undertake due diligence field investigations (e.g. geotechnical, utilities, soil and groundwater contamination) prior to securing firm funding commitments.

Regardless of funding sources for capital costs, the Region will be responsible for funding property acquisition, system operation, maintenance, and rehabilitation.

Procurement

The approach to procurement will be determined after completion of the business case, further design work and after funding sources have been identified. The Region is currently in a 30-year design-build-finance-operate-maintain (DBFOM) contract with GrandLinq for the Stage 1 ION LRT system. The contractual implications of the Stage 2 ION integration into the Region's LRT system still have to be thoroughly examined.

Implementation

The following are the steps and timeline to advance the project far enough to support a funding request:

- 2024 Initial Business Case Completion
- 2025-2026 Field investigations and preliminary design
- 2026-2027 Preliminary Design Business Case
- 2027 Funding Applications

The following are the steps and lead times to implement the project after funding agreements have been secured:

- Year 0 Funding sources identified and agreements secured
- Year 1-3 Reference design and property acquisition
- Year 4-5 Enabling works and utility relocations
- Year 6-11 Construction

The timeline for construction start is currently unknown and highly dependent on identifying funding sources, the method of procurement, successful completion of property acquisition and utility relocations, and other factors. Construction duration is dependent on the procurement strategy**.**

6. Area Municipality Communication and Public/Stakeholder Engagement:

Area Municipality Communication: The City of Cambridge and the City of Kitchener have been key partners throughout the Stage 2 ION project and are members of the project's Technical Advisory Committee. The City of Cambridge will have input into the south terminus re-evaluation process.

7. Financial Implications:

The Region's approved 2023-2032 Rapid Transit Capital Program includes $1,664,000 in 2023 for Phase 2 Environmental Assessment (project #68024) to be funded from the RTMP Reserve Fund (61%, $1,015,040) and from the Public Transit Development

Charge Reserve Fund (39%, $648,960). The budget will be used for previously approved consulting contracts, internal staffing and upcoming business case costs.

8. Conclusion / Next Steps:

- Summer 2023 Complete south terminus re-evaluation
- Fall 2023 IBC Request for Proposals, south terminus functional design
- 2024 Complete IBC
- 2025-2026 Preliminary design work and field investigations
- 2026-2027 Preliminary Design Business Case (PDBC)

9. Attachments:

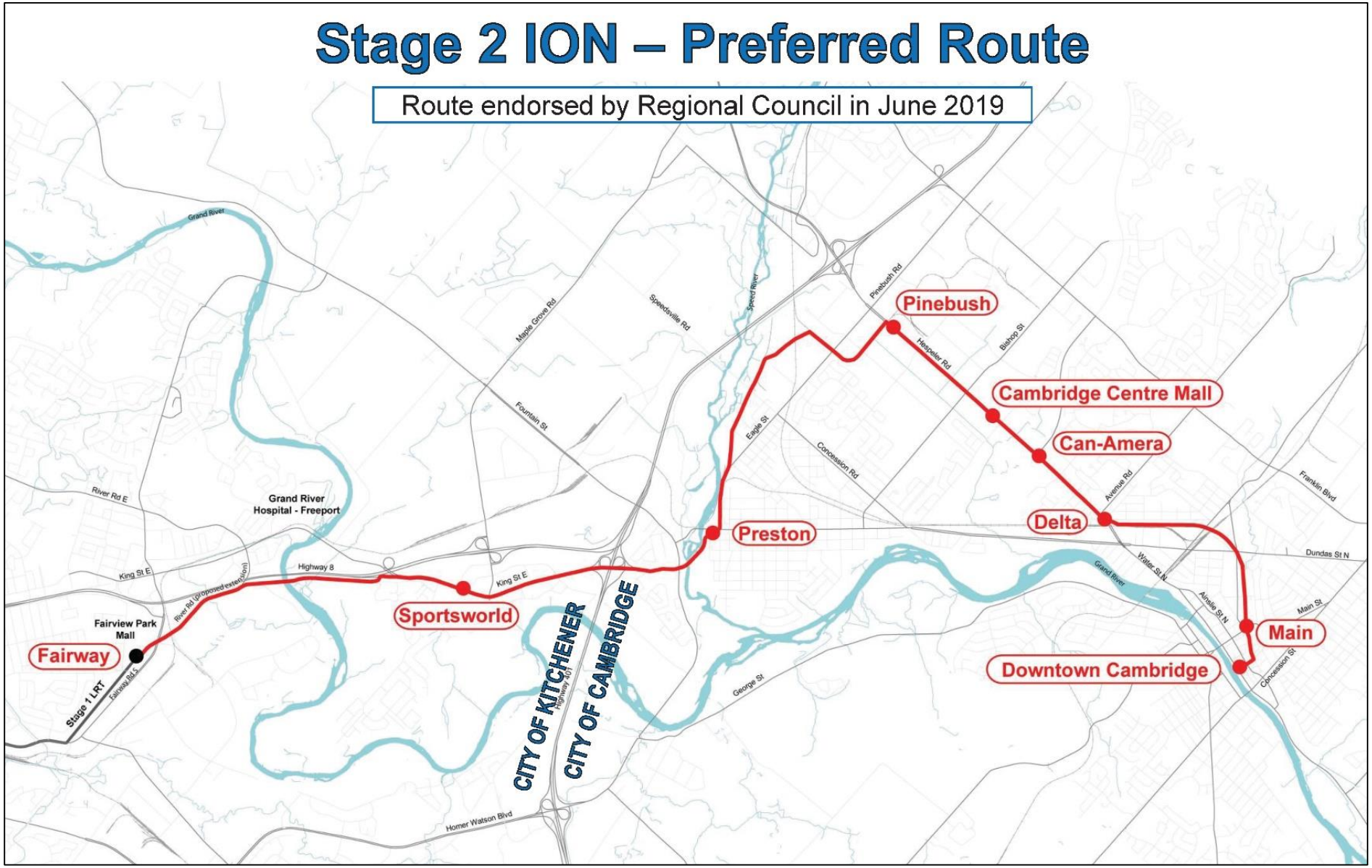
Appendix A: 2019 Preferred Route Map
Appendix B: Project Alternatives

Prepared By: Matthew O'Neil, Manager, Rapid Transit Coordination

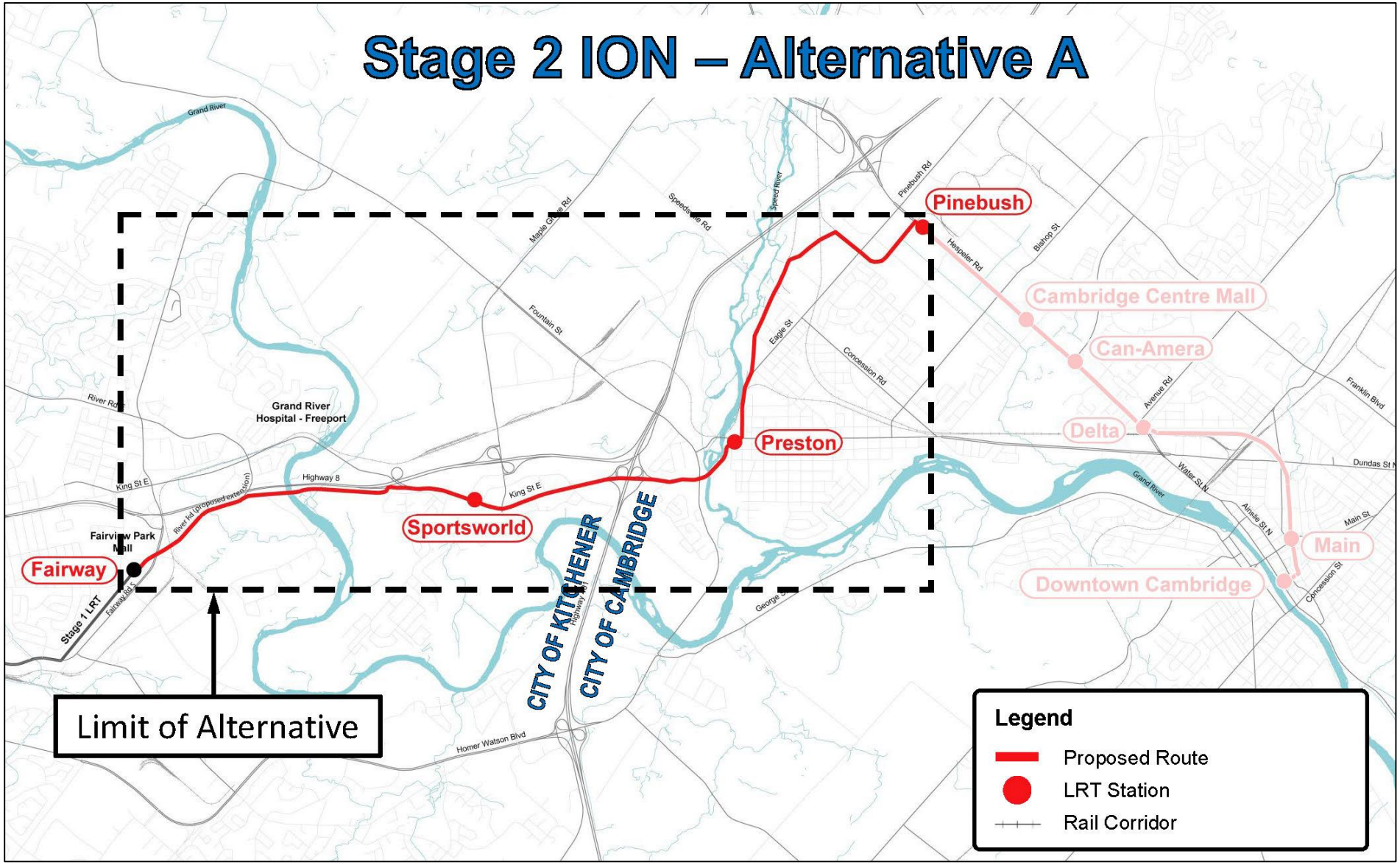
Reviewed By: Gord Ryan, Director, Rapid Transit

Approved By: Mathieu Goetzke, Commissioner, Transportation Services

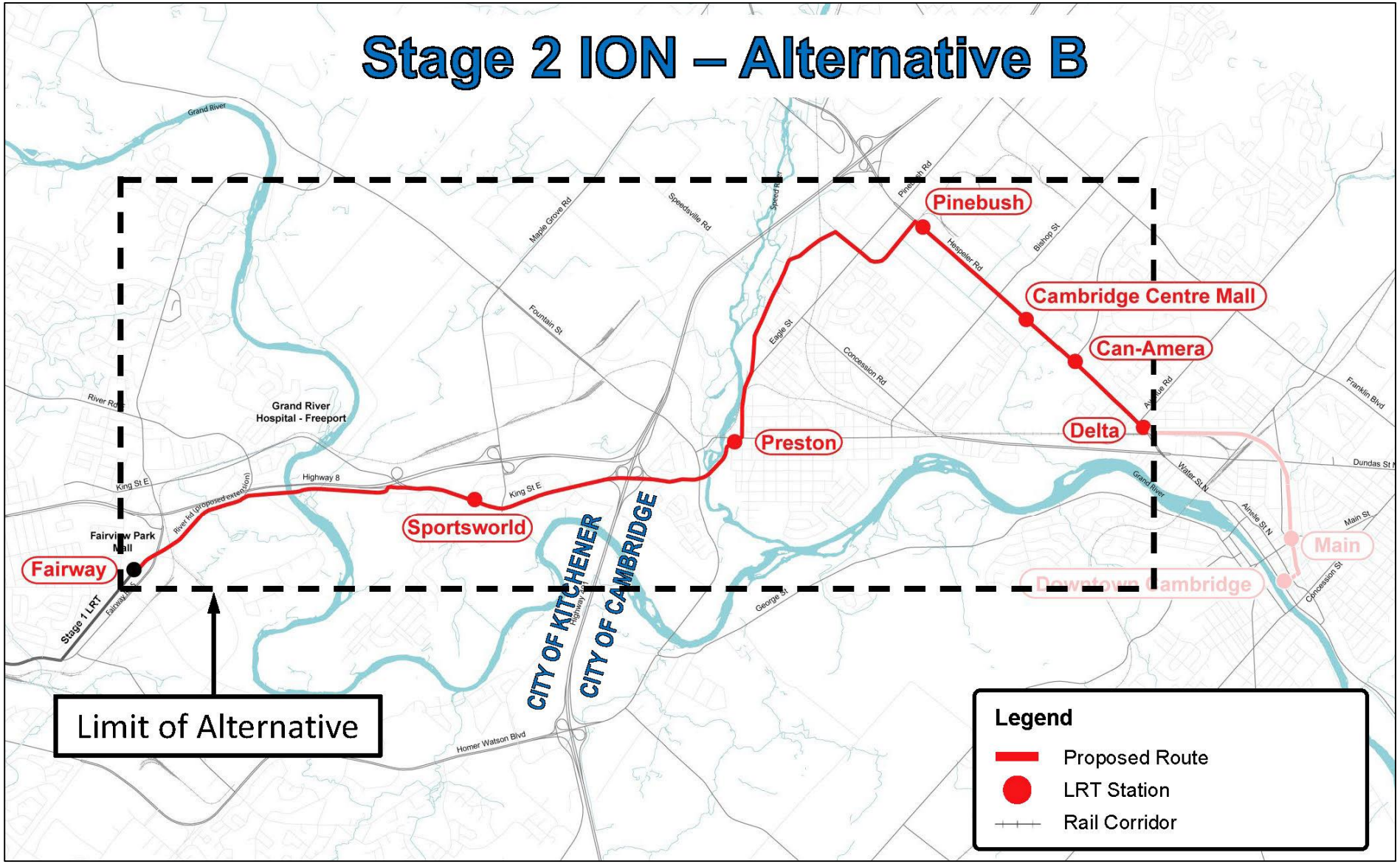
Appendix A: Map of Preferred Route



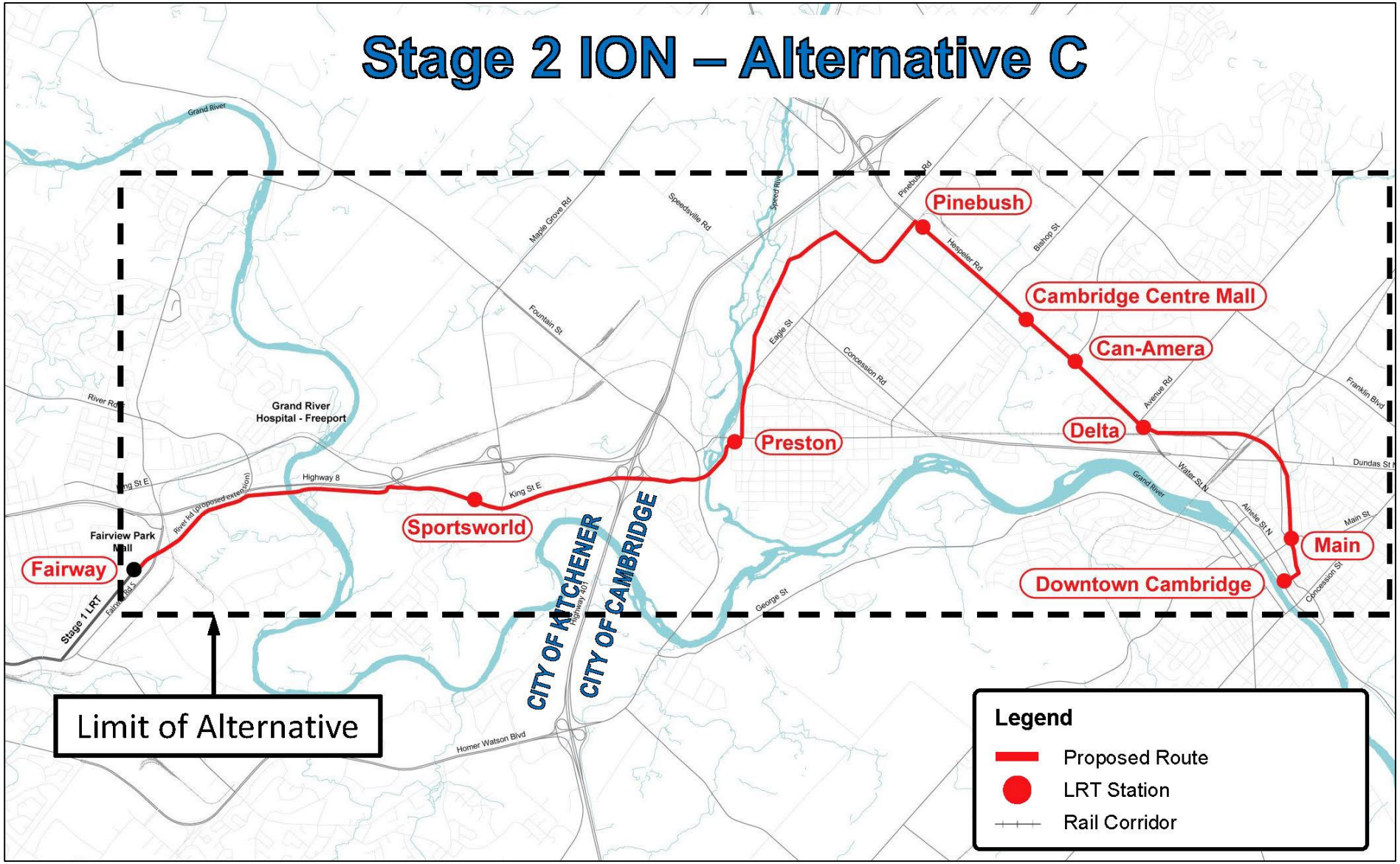
Appendix B: Map of Alternative A



Appendix B: Map of Alternative B



Appendix B: Map of Alternative C



Region of Waterloo

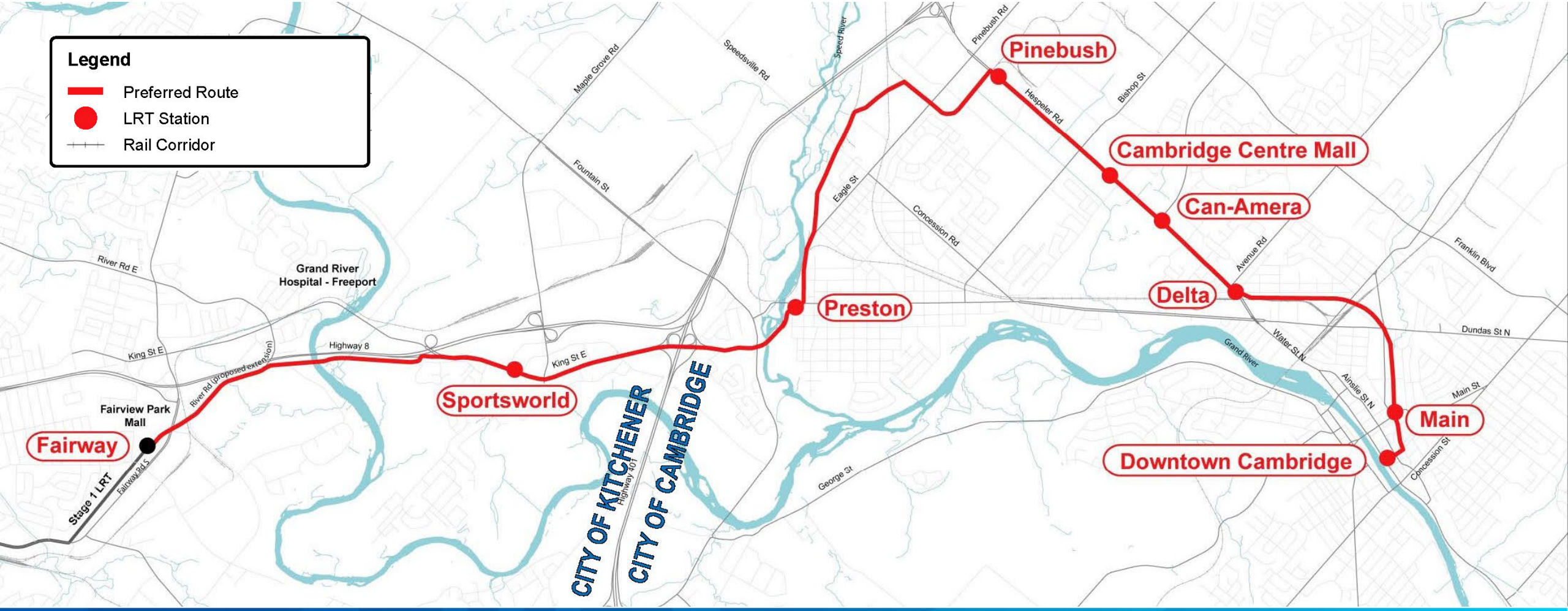
Stage 2 ION Project Update

April 4, 2023

Work to Date

- Route evaluation and selection of Preferred Route
- Public Consultation
- Transit Project Assessment Process (TPAP)
- Environmental Project Report (EPR)
- Functional Design

Preferred Route



Project Goals

- Provide greater transportation choice
- Protect farmland and countryside
- Build a thriving economy with global reach
- Build vibrant urban places
- Foster opportunities for current and future generations
- Support a sustainable region

Project Benefits

- Expand access to Regional and Provincial's transit system and services
- Leverage strategic investments in intra- and inter-regional transit
- Supports 15-minute communities
- Attract mixed-use developments to urban areas
- Supports a range of housing types close to jobs and services

Cost Estimates

- Capital (Escalated)
  - $2.9B to Pinebush (A), $3.93B to Delta (B), $4.46B to Downtown (C)
- Property (2022$)
  - $125M to Pinebush (A), $165M to Delta (B), $200M to Downtown (C)
- O&M+R (Annualized, 2022$)
  - $9.4M to Pinebush (A). $18.8M to Delta (B), $22.6M to Downtown (C)

Next Steps

- Summer 2023 Complete south terminus re-evaluation
- Fall 2023 IBC RFP, south terminus functional design
- 2024 Complete Initial Business Case
- 2026-2026 Preliminary design work and field investigations
- 2026-2027 Preliminary design business case (PDBC)