

REM de l'Est Progress Report

FEBRUARY 2021

Filiale de la Caisse de dépôt et placement du Québec | cdpqinfra.com

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Summary

1 Project highlights p.2

2 Analysis and reference project p.6

3 Project update p.9

4 Maps showing downtown area issues p.14

5 Scenarios analyzed for the downtown area p.17

1. Project highlights



REM de l'Est reference route

7 days a week

schedule synchronized with the Montréal metro

2 to 4 min.

rush-hour frequency

100%

electric and automated

\$10B

total estimated project cost

32 km

dedicated tracks:
7 km underground and 25 km above ground

23 stations

universally accessible



Stations 
 Intermodal stations 
 Potential station 
 Aerial track 
 Underground track 

Structuring effects for the East end and Greater Montréal



Mobility

Up to 70% shorter travel times for users

133,000

users per day (2044)

380 million

passenger-km per year (2044)

- 165 million

vehicle-km (2044)



Integration

Aerial structure and station design with a modern emblematic signature for downtown Montréal, worthy of a major city.



Environment

Encourages sustainable mobility

35,000 tonnes

less GHG per year

165 million

less vehicle-km (2044)



Economic

Serves 27 million square feet of vacant lots ripe for redevelopment

DURING CONSTRUCTION

+ \$6.3B

contribution to GDP in Québec

+ 60 000

direct and indirect jobs

Importance of offering an attractive solution

OBJECTIVES FOR REM DE L'EST

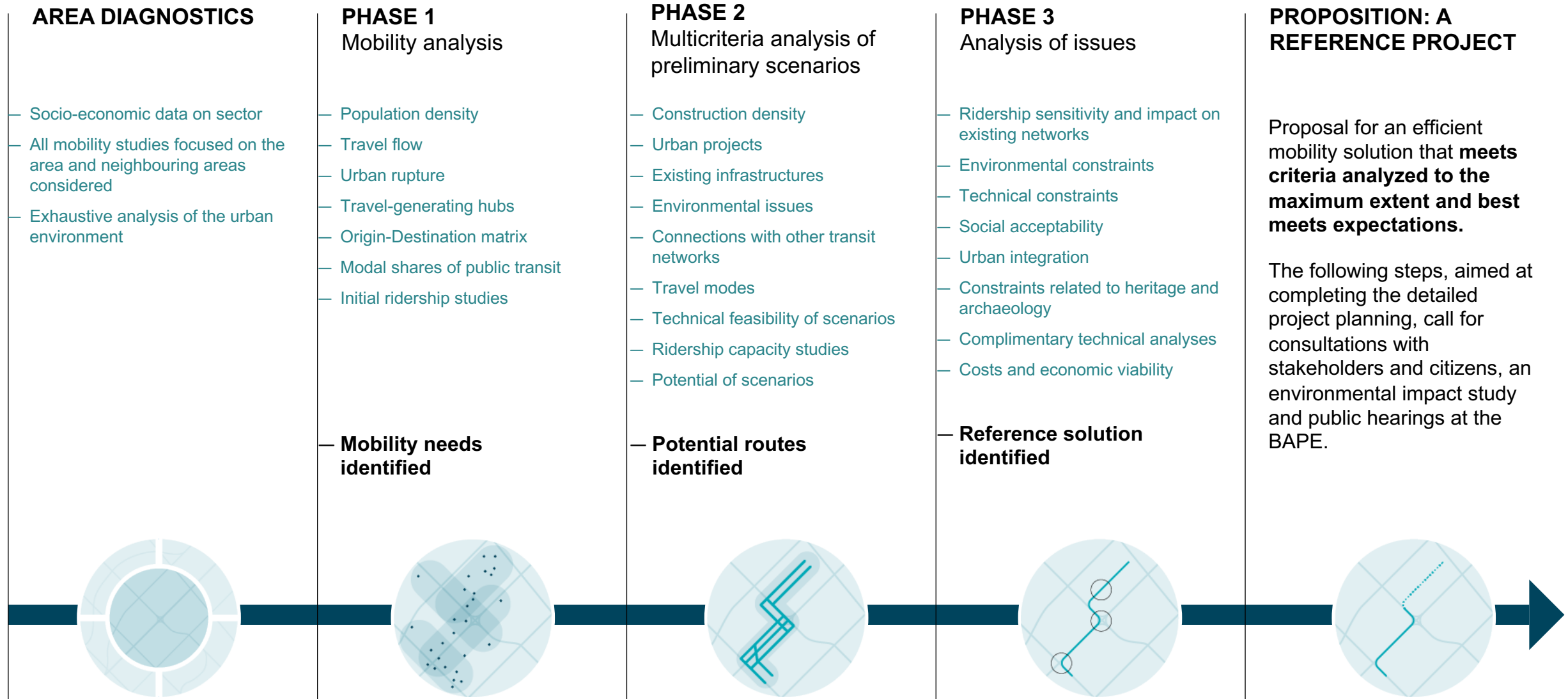
	By car	By existing public transit	With REM de l'Est:	% time saving over car use
Pointe-aux-Trembles ↔ downtown	40 to 80 minutes on average	45 to 60 minutes on average	25 MINUTES	35 to 70%
Parc Maisonneuve ↔ downtown	15 to 35 minutes on average	35 to 55 minutes on average	10 MINUTES	30 to 70%
Cégep Marie-Victorin ↔ downtown	40 to 75 minutes on average	55 to 70 minutes on average	30 MINUTES	25 to 60%

2. Analysis and reference project

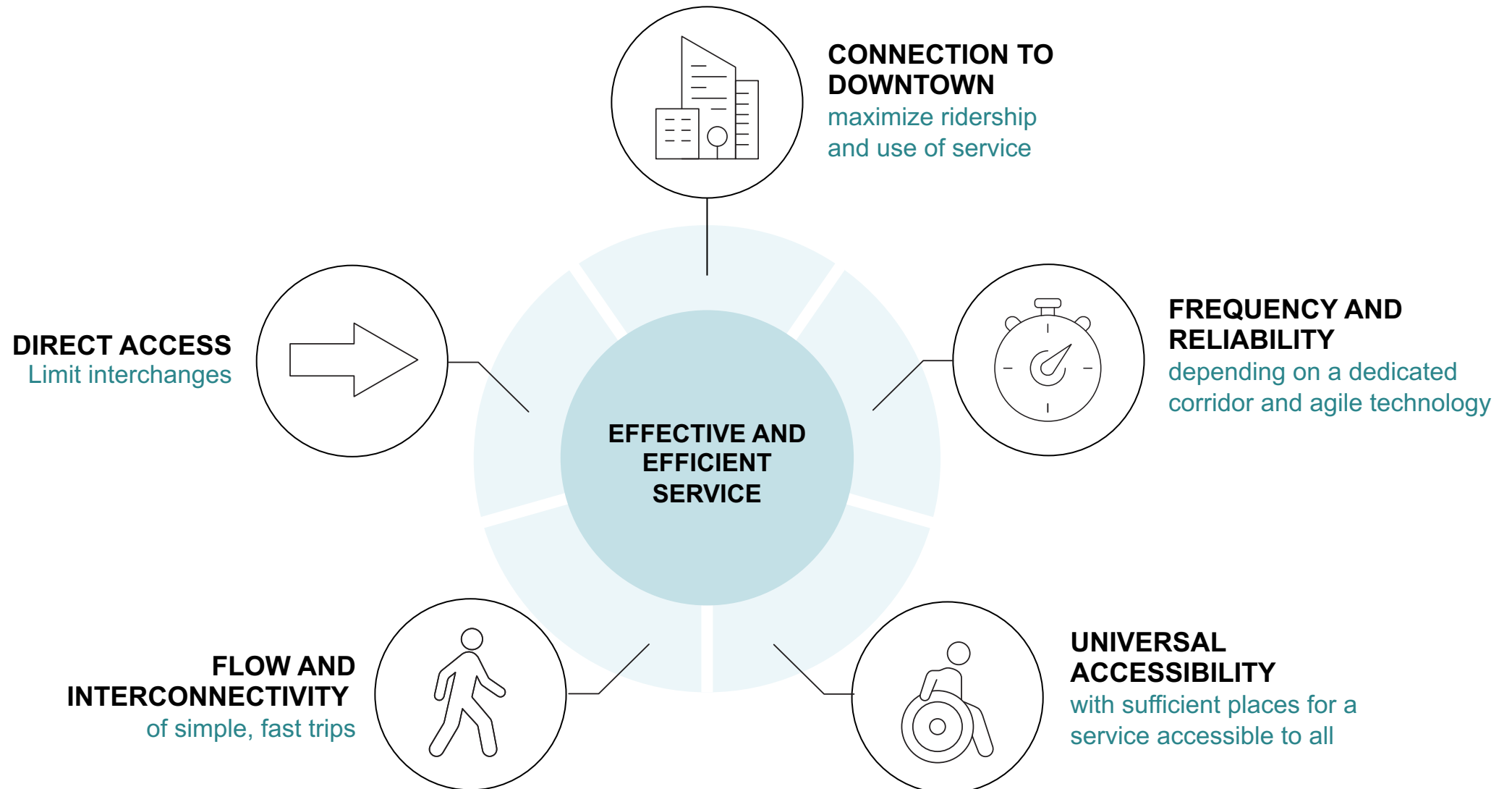
18 MONTHS OF ANALYSIS



Inputs considered in the choice of the solution



Principles to foster widespread adoption of public transit






3. Project update

FEBRUARY 2021



Components of the consultations to come

 Environmental evaluation	 Advisory committee on urban and architectural integration	 Consultations with citizens
<ul style="list-style-type: none"> • Survey to gather issues (project notification) to gain an overview of opinions and find out what subjects are of keenest interest • Environmental impact study available to all ahead of public hearings • BAPE public hearings A process recognized and supervised by the Ministère de l'environnement 	<ul style="list-style-type: none"> • Advisory committee on urban and architectural integration to ensure exemplary integration of the project 	<ul style="list-style-type: none"> • Consultations with citizens to answer questions, hear priorities and recommendations, and hold discussions on the project • Documentation available online to give a clear understanding of the project • Virtual consultation April, May and June • Start of meetings with citizens April, May and June • Ongoing meetings with civil society



Reminder of environmental evaluation process

PROJECT ENVIRONMENTAL ASSESSMENT AND REGULATORY SUPERVISION



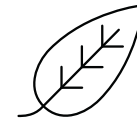
Project notification to the MELCC
February 2021



MELCC online public consultations
March 2021



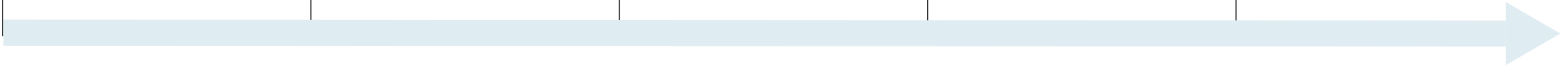
Environmental impact study filed with MELCC
Late 2021



Public hearings at the BAPE
Early 2022



Environmental decree issued
2022





Guiding principles for advisory committee

Vision: Inspired by best practices worldwide, achieve exemplary landscaping and architectural integration of REM de l'Est

Mandate	Composition	Functioning
<ul style="list-style-type: none">• Issue recommendations to the project office on the network's architectural quality and urban integration upstream of design• Participate in formulating guidelines for the architectural concept to be imposed on consortiums in the request for proposals process• Opinions addressed to other competent authorities regarding urban development around the project will also be documented and recorded	<ul style="list-style-type: none">• Approximately ten independent experts in varied fields (architecture, urban planning, urban development, heritage, public art, etc.)• Members picked for their expertise, deep knowledge and commitment	<ul style="list-style-type: none">• Work sessions around themes (stations, structures, development around stations) and sectors (downtown, Notre-Dame Street, Sherbrooke Street, Marie-Victorin Branch)• Regular meetings starting March 2021• Hosted by an outside independent facilitator• Recommendations published in late 2021



Discussions with stakeholders and consultations with citizens

January 2021

Municipal councillors

- Ville-Marie Borough
- Mercier-Hochelaga-Maisonneuve Borough
- Rivière-des-Prairies – Pointe-aux-Trembles Borough
- Montréal-Nord Borough
- Saint-Léonard Borough
- Rosemont-La-Petite-Patrie Borough
- Ville de Montréal-Est
- Les Moulins RCM
- L'Assomption RCM

February 2021

Civil society

- Professional orders (architects, urban planners, engineers)
- Environmental groups
- Organizations representing citizens
- Citizen groups
- Chambers of commerce
- Business development associations
- Business community
- University researchers

March 2021

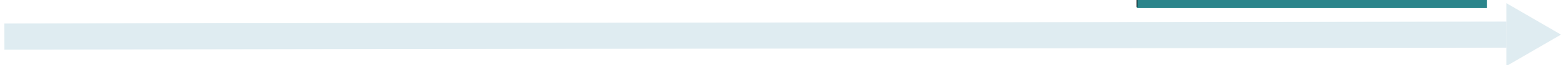
Continuation of meetings with stakeholders

- Ongoing discussions and dialogue

April 2021

Start of citizen consultations

- Meetings in the various areas served by REM de l'Est
- Virtual consultations



4. Maps showing downtown area issues



Physical constraints – metro line tunnels

Analysis of potential downtown integration takes into account the location of the Montréal metro's orange and yellow line tunnels

These are massive underground infrastructures dictating the analysis of various options for integration of the REM de l'Est route in the downtown area.

FINDINGS

- The metro's yellow line tunnel runs along St-Denis street down to the river.
- The orange line tunnel runs under Berri Street down to Viger Street before turning westward.
- At René-Lévesque Boulevard, the two tunnels run parallel, but at different depths.

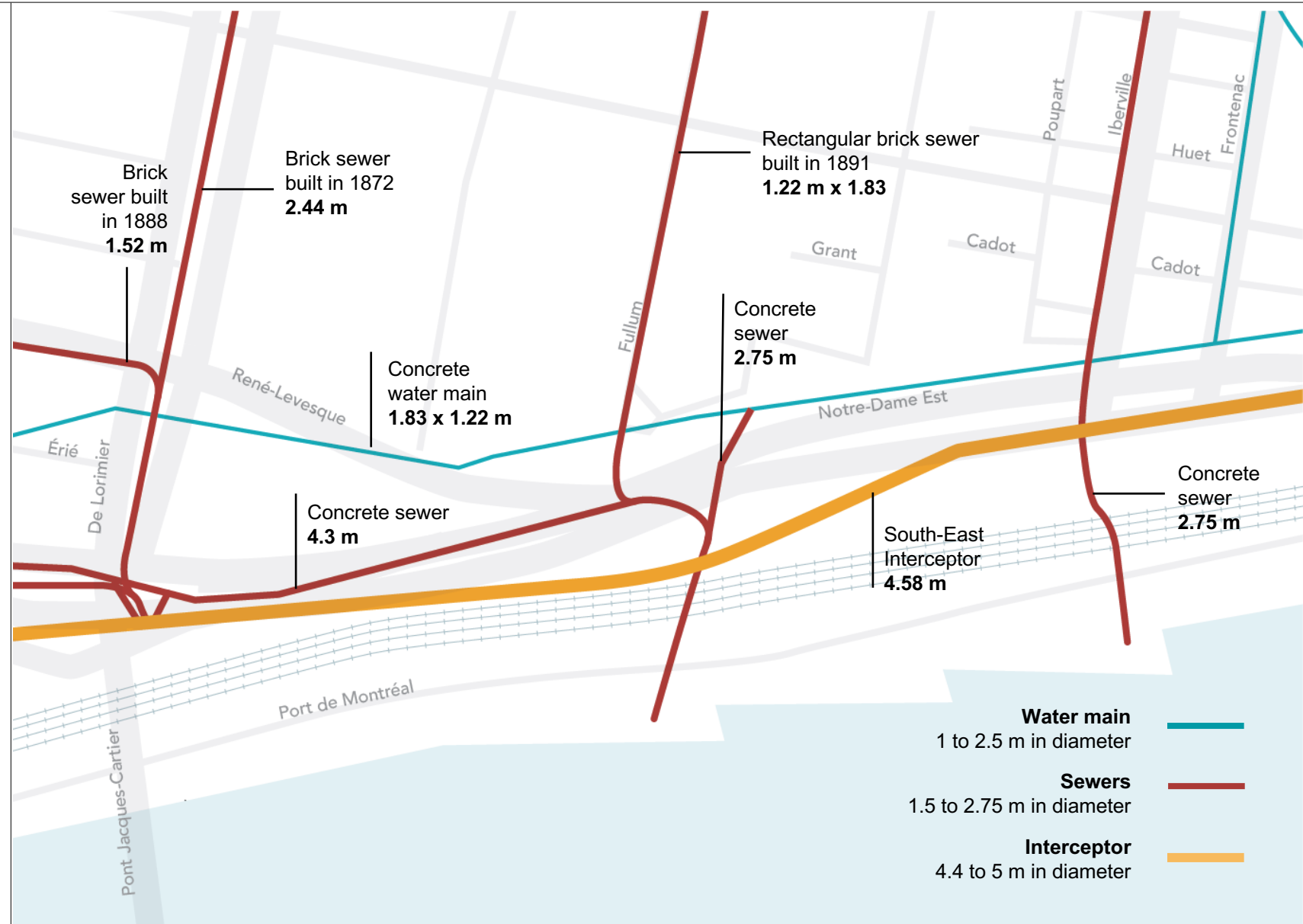


Physical constraints – City of Montréal water mains and sewers

Analysis of potential integration takes into account issues arising from the presence of numerous buried utility infrastructures.

FINDINGS

- Large conduits running through the route area are essential to the functioning of the City of Montréal’s sewer system.
- These sewers contain substantial flows that preclude connection to other existing sewers.
- Many conduits are ancient and located at drainage points, making relocation impossible.

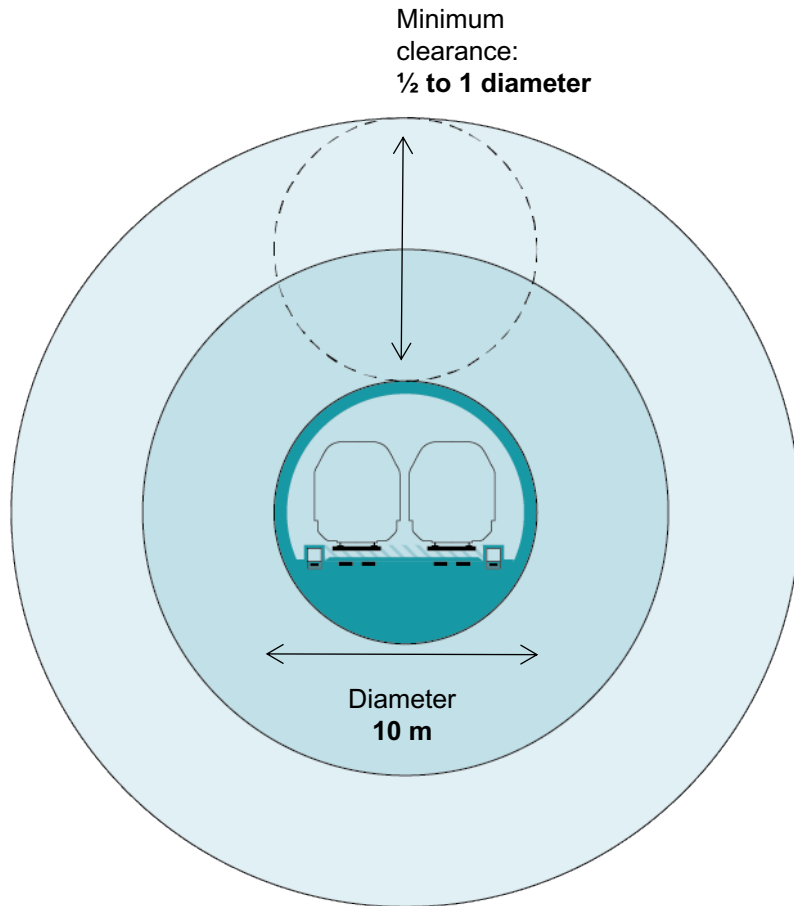


5. Analysis of downtown integration scenarios

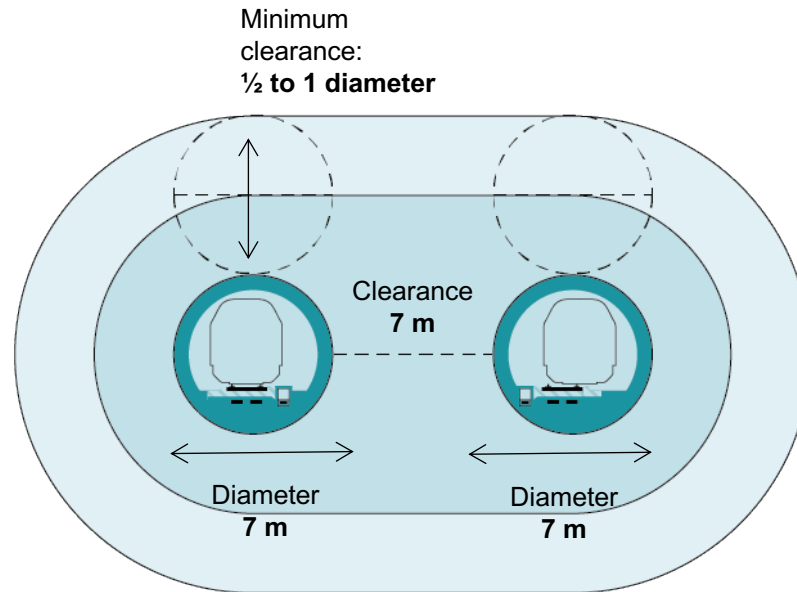


Tunnel types studied

MONOTUBE



BITUBE



A MECHANICAL MONSTER

All underground integration solutions studied involve the use of a hybrid tunnel boring machine in order to bore through loose ground and through rock.

Boring using a hybrid tunnel machine is rare and very complex. The boring head needs to be changed depending on resistance of the ground.

Deep Notre-Dame tunnel from east of Jacques-Cartier Bridge

! Single entrance shaft: **loss of flexibility affecting schedule**

! **Very deep stations:** running beneath the yellow line at a **minimum depth of 50 m**

! **Huge volumes to be excavated underground** (10,000 m³)

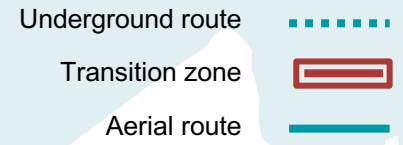
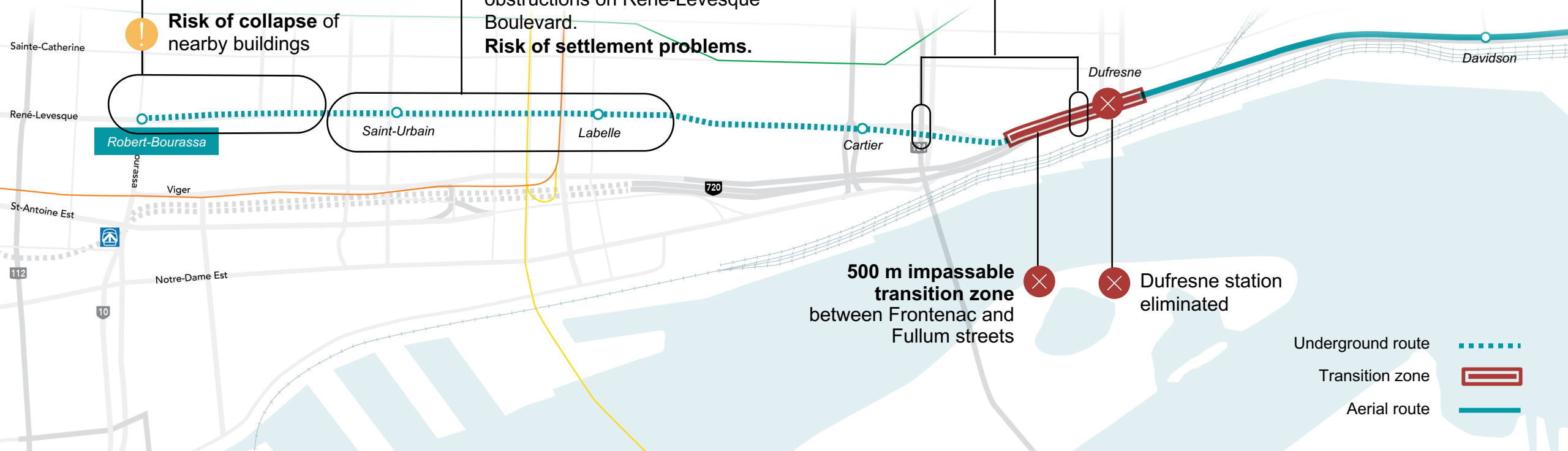
! **Risk of collapse of nearby buildings**

! Station entrances and entrance shafts excavated in open-sky conditions. Long-lasting major obstructions on René-Levesque Boulevard. **Risk of settlement problems.**

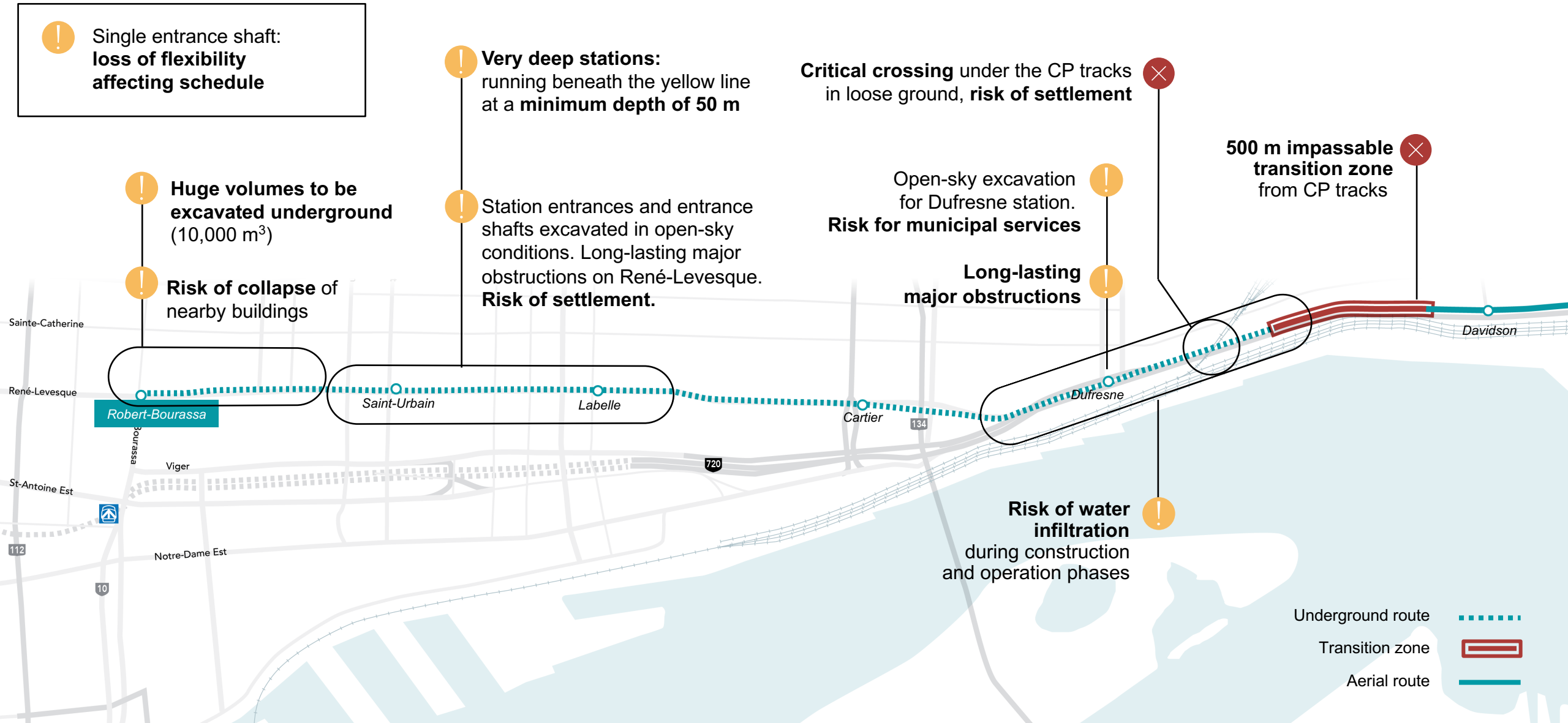
⊗ Two century-old sewers that **cannot be moved**

500 m impassable transition zone between Frontenac and Fullum streets

⊗ **Dufresne station eliminated**



Deep Notre-Dame tunnel from east of the Canadian Pacific tracks



! Single entrance shaft: **loss of flexibility affecting schedule**

! **Huge volumes to be excavated underground** (10,000 m³)

! **Risk of collapse of nearby buildings**

! **Very deep stations:** running beneath the yellow line at a **minimum depth of 50 m**

! Station entrances and entrance shafts excavated in open-sky conditions. Long-lasting major obstructions on René-Levesque. **Risk of settlement.**

Critical crossing under the CP tracks in loose ground, **risk of settlement**

Open-sky excavation for Dufresne station. **Risk for municipal services**

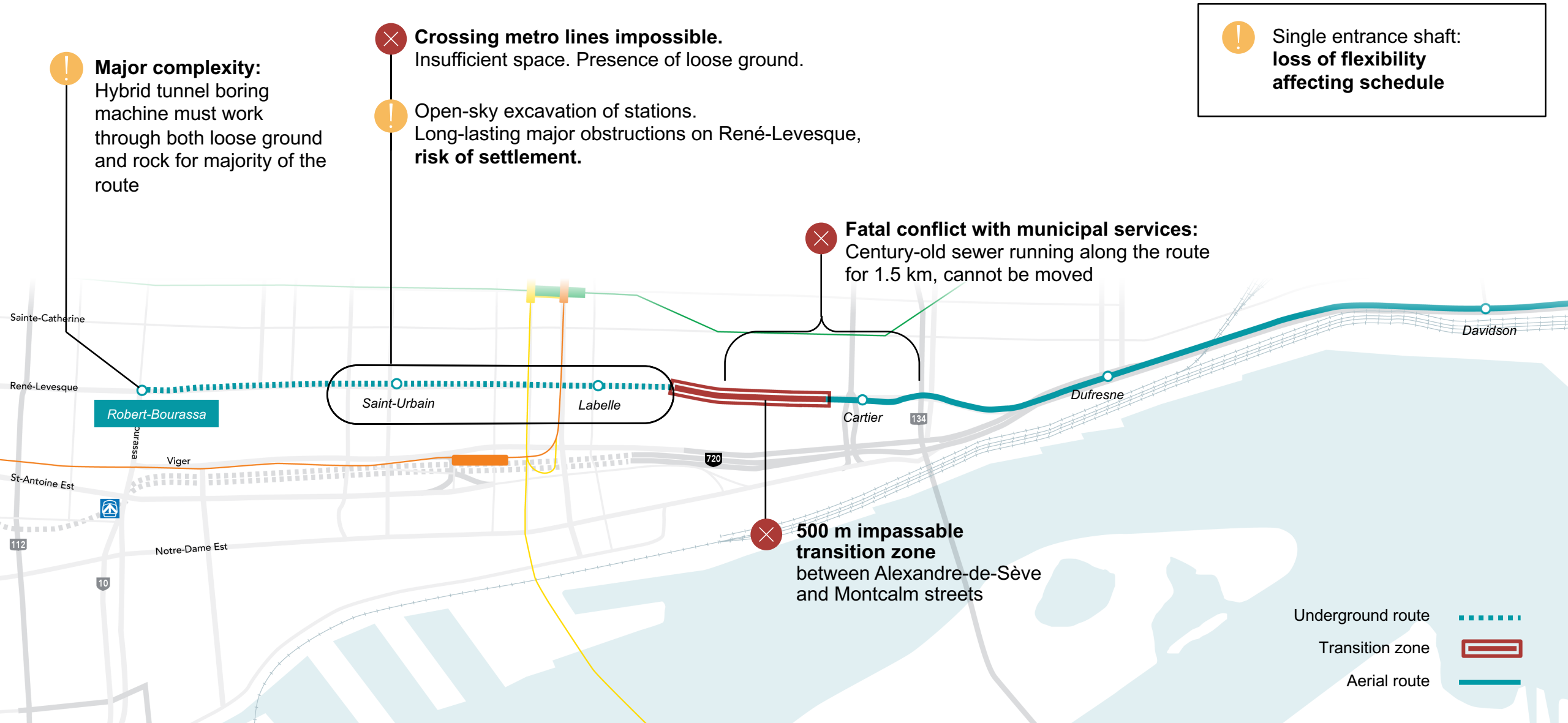
Long-lasting major obstructions

500 m impassable transition zone from CP tracks

Risk of water infiltration during construction and operation phases

Underground route
Transition zone
Aerial route

Short René-Lévesque tunnel between the two metro lines (yellow and orange)



Major complexity:
Hybrid tunnel boring machine must work through both loose ground and rock for majority of the route

✗ Crossing metro lines impossible.
Insufficient space. Presence of loose ground.

! Open-sky excavation of stations.
Long-lasting major obstructions on René-Levesque, **risk of settlement.**

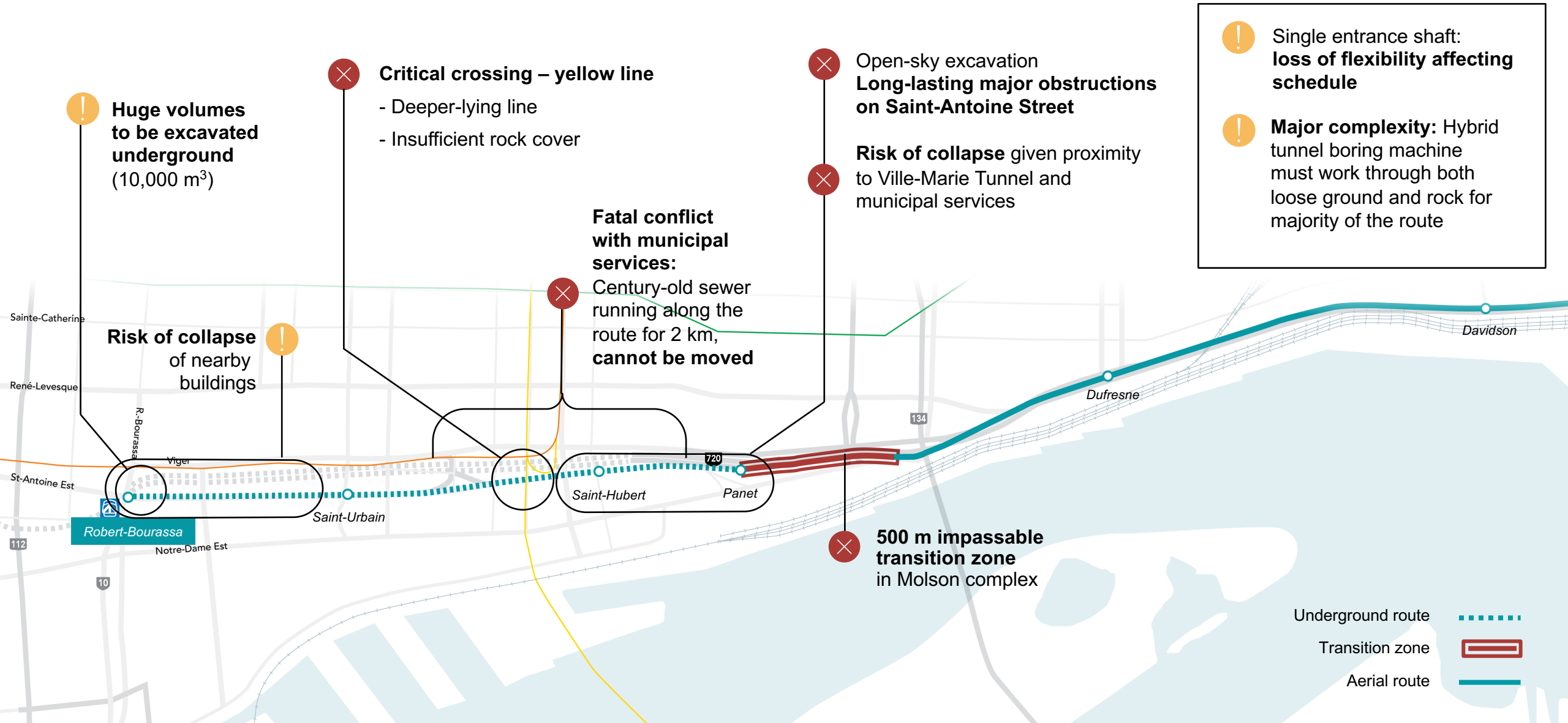
✗ Fatal conflict with municipal services:
Century-old sewer running along the route for 1.5 km, cannot be moved

✗ 500 m impassable transition zone
between Alexandre-de-Sève and Montcalm streets

! Single entrance shaft:
loss of flexibility
affecting schedule

Underground route ⋯
Transition zone
Aerial route —

Saint-Antoine tunnel



! Huge volumes to be excavated underground (10,000 m³)

! Risk of collapse of nearby buildings

⊗ Critical crossing – yellow line
 - Deeper-lying line
 - Insufficient rock cover

⊗ Fatal conflict with municipal services:
 Century-old sewer running along the route for 2 km, cannot be moved

⊗ Open-sky excavation
 Long-lasting major obstructions on Saint-Antoine Street
 ⊗ Risk of collapse given proximity to Ville-Marie Tunnel and municipal services

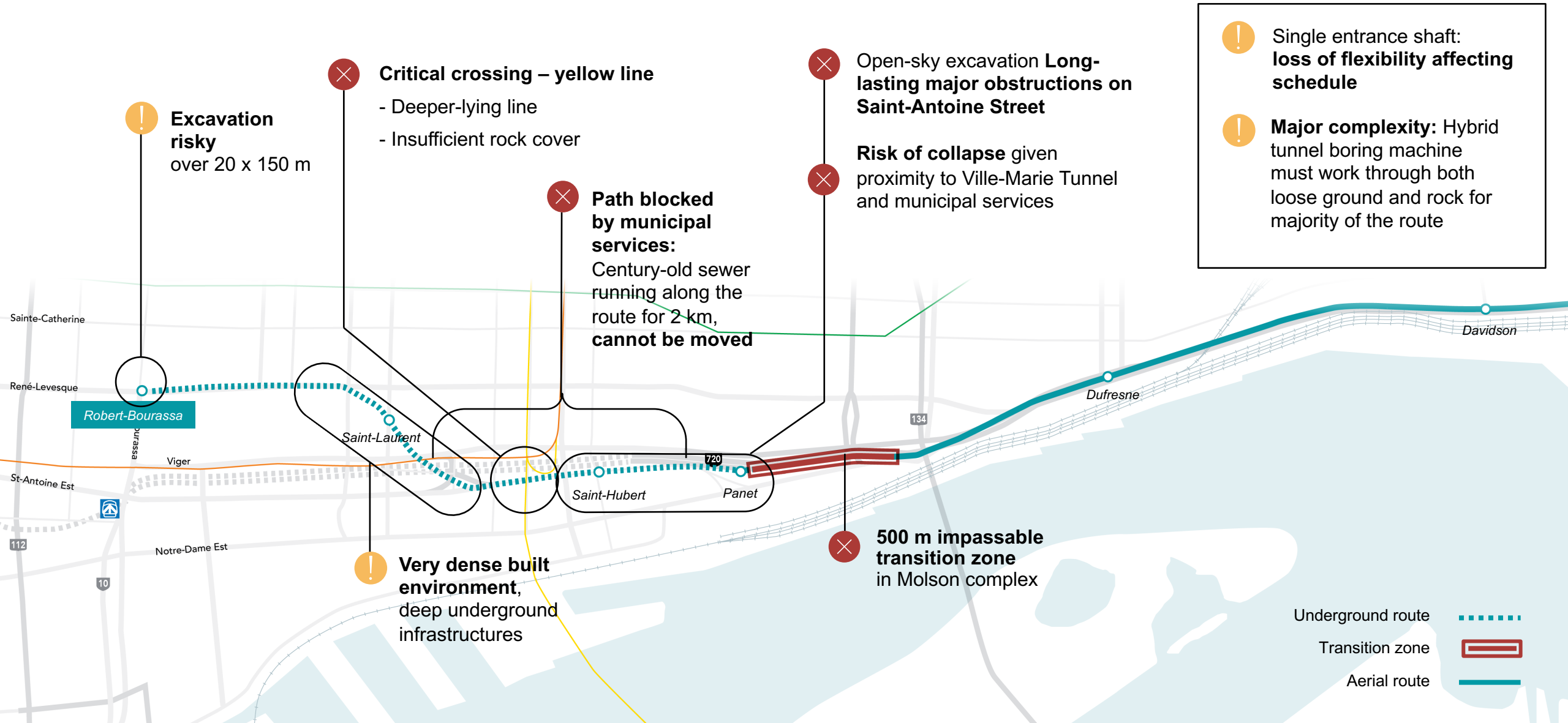
⊗ 500 m impassable transition zone in Molson complex

! Single entrance shaft: **loss of flexibility affecting schedule**

! **Major complexity:** Hybrid tunnel boring machine must work through both loose ground and rock for majority of the route

- Underground route ⋯
- Transition zone
- Aerial route —

Viger / René-Lévesque tunnel



- ! Single entrance shaft: **loss of flexibility affecting schedule**
- ! **Major complexity:** Hybrid tunnel boring machine must work through both loose ground and rock for majority of the route

! **Excavation risky**
over 20 x 150 m

⊗ **Critical crossing – yellow line**
- Deeper-lying line
- Insufficient rock cover

⊗ **Path blocked by municipal services:**
Century-old sewer running along the route for 2 km, **cannot be moved**

⊗ **Open-sky excavation Long-lasting major obstructions on Saint-Antoine Street**

⊗ **Risk of collapse** given proximity to Ville-Marie Tunnel and municipal services

! **Very dense built environment,** deep underground infrastructures

⊗ **500 m impassable transition zone** in Molson complex

Underground route ⋯
Transition zone
Aerial route —

Highway 720 tunnel

Tunnel bend and slope too pronounced beyond Champ-de-Mars station

- 26%

forecast daily trips

~ -50%

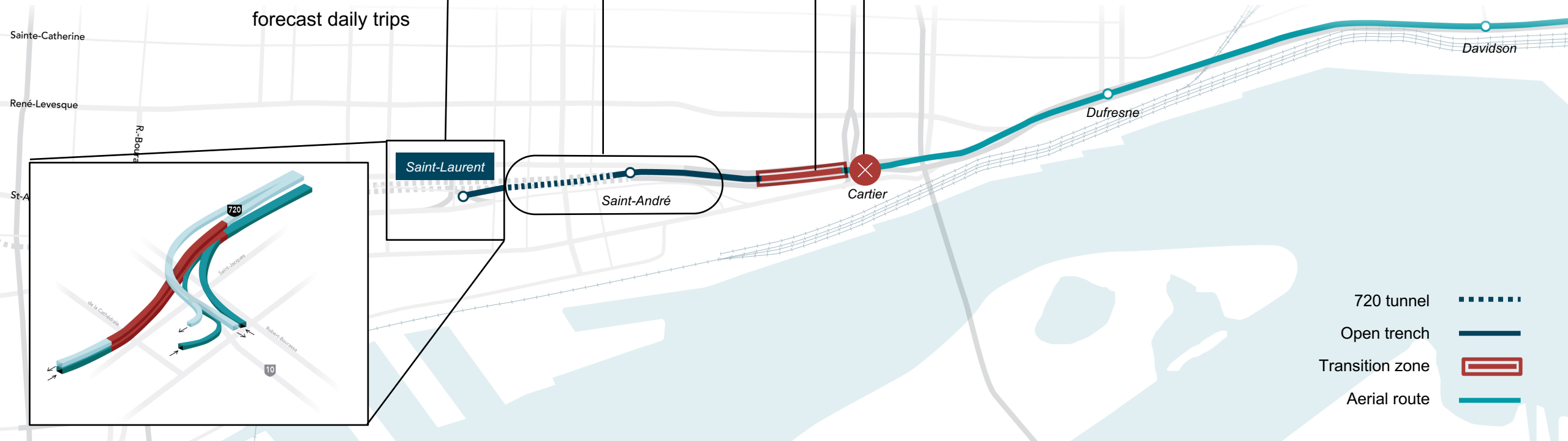
of vehicle traffic capacity on Highway 720

250 m impassable transition zone between Papineau and Wolfe streets

Cartier station eliminated

Impacts on MTQ works:

























- ! Problems regarding work guarantees
- ! Construction times



Summary of main issues by scenario

 Critical

 Fatal

		Physical constraints	Safety and construction issues	Social impact		Lost ridership (out of 133,000 trips per day)
				In construction phase	In operation phase	
A	Deep Notre-Dame tunnel from east of Jacques-Cartier Bridge					-14% (-18,000)
B	Deep Notre-Dame tunnel from east of the Canadian Pacific tracks					-14% (-18,000)
C	René-Lévesque tunnel between two metro lines (yellow and orange)					- 10% (-13,000)
D	Saint-Antoine tunnel					-14% (-18,000)
E	Viger / René-Lévesque tunnel					- 17% (-22,000)
F	Highway 720 tunnel					- 26% (-35,000)

Progress report

- In December 2020, CDPQ Infra presented the REM de l'Est project, the result of approximately 18 months of studies and analyses aimed at developing the best transit solution for the east of Montréal
- Seven scenarios for the portion of the route linking with downtown Montréal were studied:
 - Out of the seven scenarios analyzed, six were for an underground route and one an aerial route
- To achieve successful urban and architectural integration worthy of a world metropolis, an advisory committee made up of independent experts will be formed in the coming weeks
- Consultations with citizens will be held throughout the spring, starting in April 2021
- The BAPE process will be launched in March, leading to hearings in 2022



For a
grand
integrated
network

