

Disclaimer

Please be advised that the information in this document reflects the context and assumptions relevant at the time of its original development, when the VIA HFR-VIA TGF Inc. (“Alto”) initiative was designed to operate under a **high-frequency rail project (“HFR”)**. **Government announced in February 2025, that the level of ambition of the project has now evolved to a high-speed rail project (“HSR”).**

As a result, **the scope of the project, its objectives, and technical direction have changed accordingly, and this document’s content, assumptions and discussions in same are therefore outdated and largely, if not entirely, no longer applicable.** Any assumptions or references in the document to the preferred alignment, economic or financial analyses, procurement models, and engagement with host railways, pertain solely to the former HFR mandate. Therefore, the planning and development of the HSR could render certain portions of this document or the whole of the document **inaccurate and irrelevant to HSR.**

Please note that **certain information related to these topics may still be redacted,** either because it could be **transposed to the new context** or because **its disclosure could compromise upcoming HSR negotiations.**

Readers are advised to consult the document **[“Fast Forward: Shaping Canada’s Future with a High-Speed Train,”](#)** for current and authoritative information.



JOINT PROJECT OFFICE HIGH FREQUENCY
RAIL PROJECT
BUSINESS CASE UPDATE

V.002 – December 2021

BANQUE DE L'INFRASTRUCTURE DU
CANADA 


VIA Rail Canada 

CANADA 
INFRASTRUCTURE BANK

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1. Executive Summary

This Business Case Update provides a summary of the planning, due diligence, and pre-procurement activities for the High Frequency Rail (HFR) project to the end of October 2021 (or otherwise indicated).

The HFR project is a project to deliver mostly dedicated and reliable rail infrastructure and systems to support the future growth of the region between Toronto and Québec City. HFR is an opportunity to transform the travel experience with increased frequencies, lower journey times, better integration with the wider transportation network, and an improvement to on-time performance.

The Government of Canada established the Joint Project Office (“JPO”) as a joint venture between the Canada Infrastructure Bank and VIA Rail Canada to conduct de-risking, due diligence, pre-procurement and planning activities, explore and analyze operating models and develop evidence-based options of procurement and financing for the HFR project and to assess the project’s viability. Subsequent to October 2021 the governance of the HFR Project has been amended whilst the JPO conclude deliverables under the mandate established in the Joint Venture Agreement between the Canada Infrastructure Bank and VIA Rail Canada. In the current Planning Phase of the Project, the Governance has been changed to enable the JPO to provide the Technical Office capability to an Integrated Team including members of Federal Departments led by Transport Canada. Future phases of the Project have been identified by Transport Canada as Procurement, Co-development, Construction and Operation and would require new Governance tailored to the needs of those phases.

The JPO activity has considered a High Frequency Rail solution delivered through alternative alignments, alternative diesel and electrified technologies and alternative Public Private Partnership delivery models. The JPO was not mandated to consider the option of a High Speed Rail solution.

Whilst within this Business Case Update infrastructure enhancements are considered between Toronto and Québec City, the operation of new and existing intercity rail services along the Corridor from Windsor to Québec City are considered within the combined future HFR Project.

Alignment

The JPO studied and evaluated six different alignment (routing) options and narrowed them to further develop three alignment options including: a refined original VIA Rail business case (developed in 2016) alignment to improve journey times, alignments following existing rail and hydro corridors, and a hybrid alignment option. As a result of net present value (NPV) analysis and other characteristics, in July 2020, the Deputy Ministers Oversight Committee (“DMOC”) provided guidance to focus further evaluation on an alignment solution from Toronto to Smith Falls allowing services to Ottawa and combining this with an alignment from Smiths Falls directly to Montréal allowing the potential for direct services between Toronto and Montréal. The characteristics included an assessment of potential communities served, environmental impact and alignment physical ability to provide for future proofing to enable any potential higher or high-speed railway in the future.

The evidence and analysis presented in this document focuses on this DMOC preferred alignment as noted above. Advancement of the alignment allowed refinement of the engineering design, review of host railway interfaces, and supported financial modelling and analysis to the end of October 2021. Further analysis of the other alignment options has not been undertaken past the July 2020 position. The alignment option selected would provide for increased communities served, increased rail ridership and stimulate modal shift but did not, of itself, demonstrate the physical characteristics of a higher or high-speed railway alignment.

Figure 1 HFR preferred alignment map



For the Toronto – Ottawa – Montréal section of the DMOC preferred alignment, this follows existing freight rail corridors connecting Toronto, Peterborough, Ottawa, and Montréal in addition to a former freight rail corridor currently used as a multi-user trail. It enables direct services between Toronto and Ottawa, and Toronto and Montréal. Between Montréal and Québec City, the proposed alignment follows the existing freight rail corridor north of the St. Lawrence River. Securing HFR access to both the T-O-M and M-Q alignments is dependent on securing Access and Operating agreements with host railways (e.g., CP, QGRY, MX, CN) in respect of the freight alignment and also the land acquisition strategy for land in private or municipal ownership.

With HFR, journey times between most of the major cities on the corridor are significantly enhanced over those available today.

Table 1 Existing VIA and future HFR travel times between major routes

Segment	Jan 2020 VIA Average Journey Times	HFR – Average Journey Times	Jan 2020 VIA Fastest Journey Time	HFR – Fastest Journey Time
Toronto – Montréal	5:03	4:10	4:49	3:59
Toronto – Ottawa	4:27	2:53	4:05	2:50
Ottawa – Montréal	2:02	1:43	1:50	1:40
Montréal – Québec City	3:24	2:51	3:11	2:45

HFR is planned to provide more daily frequencies between the major cities across the Toronto and Québec City corridor. This will give passengers more options and greater flexibility. Service levels have been derived based on the required frequencies (based on the capacity of the reference vehicle) to accommodate the future growth of ridership. Frequencies and the service offering will continue to be refined through the development of the project and considering the results of project optimisations.

Table 2 Indicative HFR Service Levels

HFR Service Levels	Service Level 1	Service Level 2	Service Level 3
Time Frame	2030-2034	2035-2044	2045-2059
Daily Round Trip Frequencies			
Montréal – Toronto	12	15	18
Toronto – Ottawa	12	15	18
Ottawa – Montréal	12	12	12
Montréal – Québec City	10	10	10

HFR Project Schedule

The JPO's projected project schedule for creation of the HFR alignment and commencement of services (including a Public Private Partnership procurement exercise, the design, construction, Impact Assessment (IA) and procurement) is in the range of 8.5 - 13 years. The timing and critical path of the project is largely driven by the duration of the IA, ranging between 3-5 years. Subsequent to determining the outline HFR Project Schedule, DMOC has selected a pathway through future phases of the project including within the procurement phase the identification and selection of a Private Delivery Partner (PDP) and thereafter a phase for Co-development of the project prior to a construction phase. This Business Case Update does not reflect this new chronology albeit the duration of the IA remains the critical path item.

City Access and Host Railways

While the HFR Project has identified the above alignment between Cities to provide primarily dedicated passenger rail usage, (albeit much in or alongside existing or former freight railways), access to Toronto, Montréal, and Québec City would continue to use shared track, right-of-way, or station facilities owned and operated by others (i.e., freight or commuter rail operators). The JPO was instructed to consider only a city center to city center option for serving major cities and assumes Toronto Union Station and Montréal Gare Centrale as the main terminus stations. The JPO was directed not to add services along the existing CN routes along the Corridor and did not make enquiries of CN as to whether this was an option.

Under the current proposal, rail traffic control would remain under host railway control where HFR operates on host railway infrastructure in host railway ROW with defined schedules. In some segments, the HFR operator would provide rail traffic control on dedicated HFR track in host ROW and adjacent to it with passenger priority. Preliminary indications from the host railways suggest that further due diligence, discussion, and analysis are required by the JPO to address the intercity operations in a shared ROW and city access constraints. The current plans include:

- Toronto: The HFR proposal assumes Toronto Union Station as a terminus station. [REDACTED]
- Montréal: The HFR proposal assumes Gare Centrale as the main station in Montréal. All HFR trains to/from Gare Centrale use host railway (primarily CN) controlled tracks on the island of Montréal. [REDACTED]
- Québec City: The HFR proposal assumes Gare du Palais as the terminus station in Québec City. [REDACTED]

The JPO has not completed de-risking work in this area and is assessing the scope and cost of new infrastructure proposed by host railways. Further assessment is required by the JPO to de-risk the city access along with defining the optimum solution that caters for the operational and performance needs of HFR.

Inherent in this Business Case Update is the assumption that the current proposal for HFR will be able to reach agreement with all host railways to enable the proposed service level frequencies, journey times and on time performance of HFR and BAU services to in turn attract and accommodate the identified ridership and modal shift to HFR

Technology

As part of its overall mandate, the JPO assessed the HFR project under two technology options, electric and diesel. The JPO was not mandated to study the alternative technology of a high-speed railway solution. Based on guidance from DMOC, electrification is presented as the preferred technology option which brings environmental benefits including reduced greenhouse gas, particulate matter, and nitrogen oxides emissions at the train source.

At this stage of the project, it is assessed that up to 93% of the alignment will be electrified (the remaining 7% being controlled by CN, which has not confirmed the feasibility of electrification. CP has expressed interoperability concerns for electrification for the intercity route. Further work is required by the JPO to understand these concerns and assess through a Safety Case and Interoperability Analysis. The ability to substantially electrify the alignment is dependent on achieving agreement with CP that allays their concerns. This work will continue as part of the host railway's discussions identified above.

In this situation, the trainsets to operate on HFR would be required to operate in both electric and diesel modes to travel on the electrified and non-electrified parts of the route.

Capital costs

While the JPO presents cost ranges within this Business Case Update, the likely capital cost for the HFR with electrification is \$27.71bn (in 2020 prices excluding inflation) and includes:

- Toronto – Ottawa – Montréal section: \$17.35bn
- Montréal – Québec City section: \$8.88bn
- Additional rolling stock and electric conversion: \$1.48bn

Revenues and Operating, Maintenance and Renewal costs

The projected total revenue over a 30-year period is \$33.7bn (in 2019 prices excluding inflation) based on the journey times and indicative opening day timetables. The likely Operations, Maintenance, and Rehabilitation (OMR) costs are outlined in Table 3.

Table 3 Total lifecycle costs (LCC) and operations, maintenance, rehabilitation (OMR) costs for HFR

2020 \$000s (2030-2059)	HFR
Total Operations	20,912,345
Total Maintenance	10,175,984
Total Rehabilitation / Life Cycle Costs	1,420,426
Total OMR Costs	32,508,755

Indicative Benefit Cost Ratio

An expanded indicative benefit cost ratio (including traveler benefits, externalities, and wider economic benefits) for the project is ~0.4 over a 30-year evaluation period. The project is expected to create 71,000 to 96,000 annual equivalent jobs throughout the construction period. Should the evaluation period be other than 30 years, the BCR would require revision.

Net Present Value

A net present value analysis was conducted to compare the alignment and technology options of the project. This assessment includes capital, operating, maintenance and lifecycle costs, net of revenue totaled over a 30-year period (representing the potential length of an initial concession). The net present value was calculated over a 30-year evaluation period as a metric for the purposes of comparison of alignment options during July 2020. This analysis has progressed since July 2020 on the preferred alignment only based on the work through to August 2021. Should the evaluation period be other than 30 years, the NPV would require revision.

Over a 30-year evaluation period, the NPV for HFR is -\$21.1bn. Based on this analysis, the discounted total 30-year revenue for the project is less than the sum of the discounted initial capital investment and the discounted 30-year total of operating, maintenance, and rehabilitation costs.

Procurement model and Financial Structuring

The JPO has assessed the Design-Build-Finance-Maintain (“DBFM”) and Design-Build-Finance-Operate-Maintain (“DBFOM”) procurement delivery models, which represent two distinct options for involving the private sector in the project. The financial structures that were proposed under each procurement delivery model allow the Government of Canada to leverage private sector involvement to 1) finance capital expenditures during the construction period and 2) receive at financial close committed Public sector subsidy requirements for a 30-year contract term.

Since April 2021, feedback from the DMOC was for the JPO to focus on two procurements models - Design Build Finance and Maintain (DBFM) #1 and Design Build Finance Maintain and Operate (DBFOM with Revenue Risk) #3. An additional option of Design Build Finance Maintain and Operate (DBFOM) #2 was requested as a fallback option.

The JPO assessed two DBFM and three DBFOM procurement options on the basis of budget certainty to the government over the life of the contract, and in terms of retained risk by the public sector and risk transfer to the private sector away from the public sector.

At this time, all financial structures considered have been modelled with no economies of scale, optimization, or assumed efficiencies through integration of activities that are expected to be proposed by a private sector if afforded the opportunity to do so. The operational efficiencies and economies of scale include examples such as man-power planning for operating services, using technology to reduce costs, and efficiencies in maintenance. Table 4 provides a comparison of project subsidies under the different models, and the required operator efficiencies to equalize the incremental subsidy under the different DBFM and DBFOM procurement models.

Table 4: Project life subsidies (over 30-years) and required operator efficiencies for the electric option

Electric	DBFM #1	DBFOM #2	DBFOM #3 Partial AP	DBFOM #3 Volume
Government Contribution %	88%	80%	80%	80%
Project Life Subsidies (\$bn)	37.1	38.9	41.8	42.2
Operator Efficiencies Needed to Equalize Subsidies	0%	4%	11%	12%
% Operating and Maintenance Risk Transferred to the Private Sector	8%	70%	72%	72%

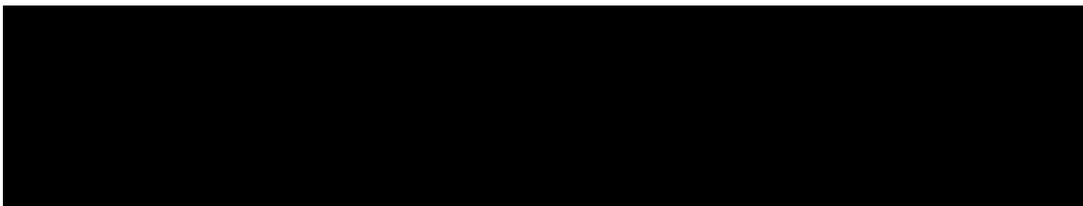
Subsequent to the JPO produced analysis, both VIA Rail Canada and the Canada Infrastructure Bank have been in dialogue with DMOC members over their preferred Procurement delivery model and ways in which to advance the HFR Project. DMOC has determined that it will advance the immediate next phase of the HFR through identifying and appointing a Private Development Partner (PDP) and then co-developing the HFR proposal with the PDP prior to the construction or operation phases. Analysis of this approach has not been considered by the JPO.

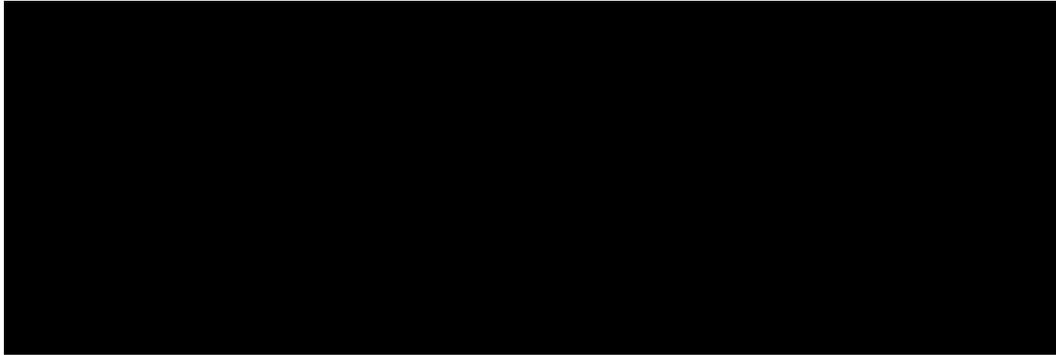
Subsequent analysis and developments since April 2021

Subsequent to the presentation of the findings of the data and analysis within the update to DMOC in April 2021 the JPO has continued to progress work to de-risk the Project and address the JPO Mandate.

Significant to the work of the JPO attention is drawn to the following areas of on-going consideration:

Alignment host railway dependency:





Land Acquisition:

- Costs for land acquisition have been updated and ranges between \$585M and \$1,092M to acquire approximately 53,047 acres to reflect additional lands required along the Winchester sub. The high-level cost estimate is based on a desktop valuation exercise was conducted in relation to the selected alignment.
- Parcels could be acquired in whole or in part, and unused portions of parcels would also be resold once no longer required. The JPO will continue to refine this estimate reflecting further due diligence activities.

Tactical and Strategic Optimisation:

JPO initial results demonstrate that Project NPV may be enhanced through continued scenario optimisation including revenue and fare strategies and alternative rolling stock strategies impacting on the required frequencies and underlying operating costs. This tactical work is continuing, including evaluating rolling stock feasibility.

Preliminary findings from the tactical optimization studies have identified that an alternative reference rolling stock may present opportunities to reduce operating costs through less HFR frequencies, by providing additional seating capacity to serve projected ridership load increases.

Additionally, alternate stations in Toronto, Montreal, and Quebec City are being assessed to further de-risk against capacity constraints at the existing termini, and to enable greater control of dispatching by the HFR proponent. This includes assessment of ridership, benefits, costs, and risks of the alternate stations.

The JPO has undertaken further work to consider a range of scenarios selected to identify the following outcomes, individually or as a or a combination:

- Maximise cost-benefit, i.e., significant net cost reductions (with a specific focus on the upfront capital costs as compared to the most recent base project) that minimize the impacts on ridership
- Maximise modal shift/reduction of GHG emissions, i.e. significant increase in ridership (as compared to the most recent base project) that can be achieved with limited/no cost increases
- If neither of the above scenarios served Gare Centrale and Union Station, an alternative approach that would serve these stations is to be presented.

The results of this optimisation exercise are covered in a separate addendum to this Business Case Update.

2. Introduction

2.1. Intent of the Document

This Business Case Update – dated December 10, 2021, provides a summary of the planning, due diligence, and pre-procurement activities for the High Frequency Rail project until the end of August 2021. This summary document supplements the “Project Status Report” (submitted to Transport Canada on April 15th, 2021) and the “Update on High Frequency Rail” (submitted to Transport Canada on December 4th, 2020) which provided the direction of travel for the Project to the Government.

This Business Case Update provides a current view of the Project but should be read in conjunction with these previous updates where fuller discussion is provided on certain aspects of the Project. This Business Case Update should not be read alone. This Business Case Update and the work of the JPO to date is supported by more detailed reports and summary of analysis identified in the following individual chapters.

This document provides analysis based on the current progress of the intercity alignment, urban alignment, technology, and procurement options. The evidence and analysis presented in this document reflect the guidance provided by the Deputy Minister’s Oversight Committee to focus on an alignment that follows existing and former freight rail corridor between Toronto, Peterborough, and Smiths Falls with an additional segment between Smiths Falls and Montréal through an existing freight corridor and an alignment following the existing freight corridor between Montréal and Québec City, north of the St. Lawrence River.

2.2. Project Context

Transportation 2030, Transport Canada’s strategic plan for the future of transportation in Canada, outlines the Government of Canada’s aspirations and strategy to develop an integrated national transportation system that:

- provides travelers with greater choice and better service;
- builds a safer and more secure transportation system;
- reduces air pollution and embraces new technologies; and
- improves the performance of the transportation system to grow the economy.

The High Frequency Rail (HFR) project is a proposed investment in intercity rail that aligns with this strategy and addresses the needs of a growing region:

- Canada’s most densely populated region will continue to grow and will require a transportation system that meets the needs of its passengers. By 2043, an additional five million people, an increase of 21% from 2020, will call Quebec and Ontario home¹; over half of the projected growth in Canada. Many are expected to live in the communities across the Toronto, Ottawa, Montréal, and Québec City regions. This region is an economic engine for

¹ Statistics Canada (2019). Population Projections for Canada (2018 to 2068), Provinces and Territories (2018 to 2043) (91-520-X). Available at: <https://www150.statcan.gc.ca/n1/pub/91-520-x/2019001/sect03-eng.htm>

the country as it accounts for more than 40% of the national GDP². People will need efficient transportation to facilitate economic activity.

- Canada is committed to reducing greenhouse gas emissions. Climate change is an environmental challenge that impacts the well-being of current and future generations. With the transportation sector as the second largest source of emissions in Canada, there is the need to develop alternatives that enable Canada to progress towards its emission reduction targets and international commitments on climate change.
- The current passenger experience is influenced by operating in shared corridors with freight trains. VIA Rail primarily operates on tracks owned and controlled by host railways, relying on their cooperation for track capacity, train schedules, and on-time performance, which has been decreasing over time. Scheduled train journey times are similar to driving as trains travel up to a maximum speed of 160 kph (100 mph) on their current route. As Canada grows, there will be increased demand for both passenger and freight rail services in this region requiring an investment to improve the passenger experience and accommodate future growth to freight, commuter, and intercity rail.

HFR provides an opportunity to transform the travel experience between the major cities across Canada's mega region through modern, resilient, and sustainable rail service. HFR is an opportunity to invest in resilient infrastructure in a dedicated corridor that supports the long-term growth of the nation's most densely populated region and Canada's commitment to reducing greenhouse gases.

2.3. Joint Project Office Mandate

The Government of Canada established the JPO as a joint venture between the Canada Infrastructure Bank and VIA Rail Canada to conduct de-risking, due diligence, pre-procurement, and planning activities, explore and analyze operating models and develop evidence-based options of procurement and financing for the HFR project and to assess the project's viability.

- VIA Rail Canada (VIA) is a crown corporation and is the national intercity rail operator providing intercity, long-distance, and essential regional rail transportation. VIA Rail prepared a business case for the Government of Canada and commissioned a study in 2016 to assess the technical and economic feasibility of the HFR Project.
- The Canada Infrastructure Bank (CIB) has a mandate to invest and attract investment from the private sector and institutional investors in revenue-generating infrastructure projects that are in the public interest. In 2019, the Government requested that the CIB assess the initial VIA business case, and as a result of that assessment, was asked to take on the role of advisor to, and a potential investor in the project.

This document presents the progress as of August 2021 and supporting evidence for the following elements within the JPO mandate:

- Intercity Alignment – present the preferred alignment for the recommended and optimized option between Toronto and Montréal, and between Montréal and Québec City;

² Statistics Canada – Table 36-10-0468-01

- Urban Alignment (City Access) – assess access into major cities (e.g., Toronto, Montréal, and Québec City) and integration of HFR with tracks used by regional transit and freight operators;
- Technology – examine rolling stock propulsion technologies; electrification and diesel; and
- Procurement – develop options to procure and finance the optimal HFR project under a Design-Build-Finance-Maintain (DBFM) or Design-Build-Finance-Operate-Maintain (DBFOM - availability, and revenue) model.

2.4. Document Structure

Similar to the “Project Status Report” (submitted to Transport Canada on April 15th, 2021) and the “Update on High Frequency Rail” presentation (submitted to Transport Canada on December 4th, 2020), this document is organized in a similar structure with the following 13 sections and provides a progress update under these themes:

- Section 2 Introduction outlines the need and context for the High Frequency Rail project and outlines the mandate of the Joint Project Office;
- Section 3 VIA Rail Background provides a summary of the existing passenger experience and performance for Toronto – Québec City services;
- Section 4 Opportunity and Vision sets out the overall opportunity of the HFR project that also aligns with Government policy and objectives;
- Section 5 Project Definition summarizes the current proposition and definition for the HFR project within the JPO mandate;
- Section 6 Strategic Case focuses on the long-term strategic benefits for the project and its alignment with the opportunity and vision;
- Section 7 Economic Case presents the progress on the economic analysis comparing the benefit and costs for the project;
- Section 8 Procurement Case presents the range of approaches available to advance the project to market including analysis on options to procure and finance the project. These are presented in the absence of a decision to this point on a selected model;
- Section 9 Financial Case presents the progress on the financial analysis including the capital costs, operating costs, lifecycle costs, ridership, and revenue for the current state for the HFR project;
- Section 10 Deliverability and Operations Case summarizes technical considerations for the delivery and operations of the project;
- Section 11 Role of VIA explores the potential changes to VIA Rail with HFR under the range of procurement model options available to advance the project; and
- Section 12 Communications Plan outlines the overall communications strategy and plan for the Project.

3. VIA Rail Background

VIA Rail Canada is the national intercity rail operator providing train services on behalf of the federal government. VIA Rail is the current operator of intercity trains between Toronto and Québec City, and also provides intercity service to communities in South Western Ontario (Figure 2).



Figure 2 Map of the VIA Rail Corridor routes and stations (Source: VIA Rail Canada)

Current Service and Passenger Experience

VIA operates its intercity services on track and stations (e.g., Union Station) that are mostly owned and controlled by host railways, which influences the frequency, speed, and on-time performance of VIA's train services. Within the Toronto – Québec City corridor, VIA currently owns track between Brockville, Ottawa, and Coteau (shown in yellow in Figure 2), which represents 3% of the track infrastructure it operates in the corridor between Québec City and Toronto. This infrastructure is maintained and dispatched through a services contract with Railterm Inc., acquired by Siemens Mobility Canada, with VIA operating the trains.

VIA currently operates between five and ten trains per day between Toronto and Québec City depending on the city pair. The ability to operate additional frequencies is currently dependent on the available capacity and access granted by the host railway. On its current routes, the maximum operating speed for these train services is 160 kph (100 mph) which is one of the

factors that affect overall journey times. Current train journey times, shown in Table 5, are similar to car journey times.

Table 5 2019 frequencies and travel times on VIA routes (Source: VIA Rail Canada)

Routes	Daily Frequencies	Average Travel Time	Shortest Scheduled Travel Time
Toronto – Ottawa	10	4:27	4:05
Ottawa – Montréal	6	2:02	1:50
Toronto – Montréal	6	5:03	4:49
Montréal – Québec City	5	3:24	3:11

Operations in corridors shared with other regional and freight trains affect overall on-time performance and passenger experience. Average on-time performance³ for all services between Québec City and Windsor was 67% in 2019 (Figure 3). On-time performance varies by train service and is dependent on track control. On the tracks that VIA controls, trains run to within 90% of schedule in the section, with higher on-time performance for trains between Ottawa and Montréal. Performance is worse on CN controlled track particularly on Toronto – Ottawa and Toronto – Montréal routes, where trains run to ~50-60% of schedule on CN controlled sections (Figure 4).

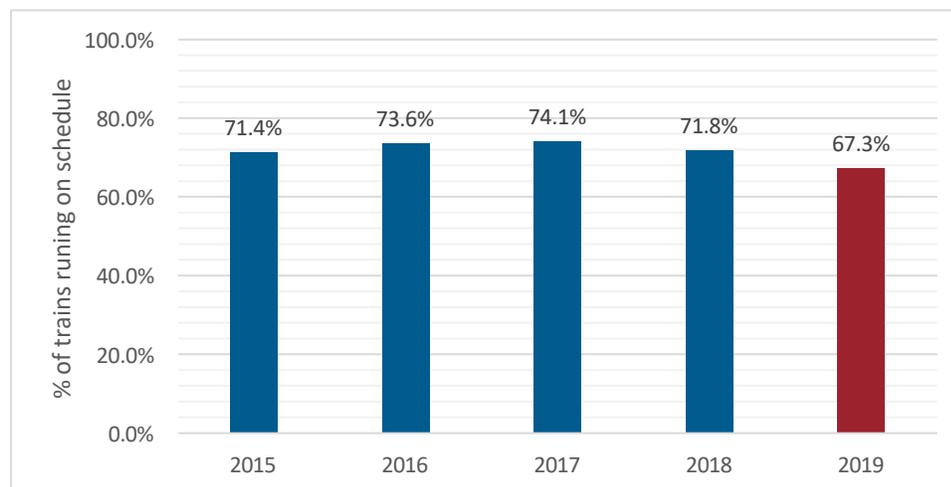


Figure 3 Total Corridor on-time performance % (Source: VIA Rail Canada)

Ridership between Toronto, Ottawa, and Montréal represents 75% of all ridership between Québec City and Windsor (Figure 5). Changes to the passenger experience on these routes have the greatest impact on total ridership. The ridership between these major hubs, therefore, accounts for a majority of VIA's ridership, and improvements in these sections would have the greatest impact on total ridership.

³ VIA Rail defines a train is on-time if it arrives within 10 minutes of its scheduled time for a journey less than 3 hours and within 15 minutes of its scheduled time for a journey greater than three hours.

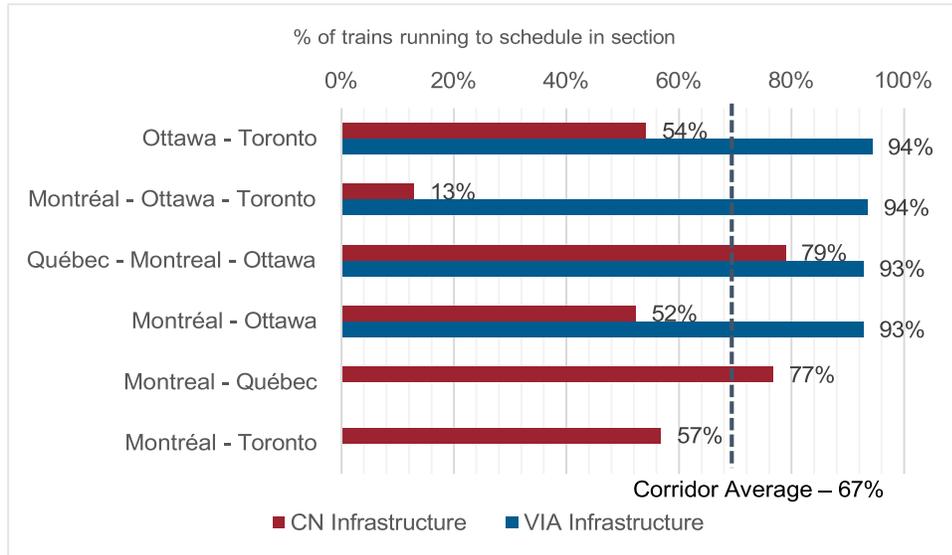


Figure 4 On-time performance by route and track control in 2019 (Source: VIA Rail Canada)

Ridership in the Corridor accounts for approximately 96% of all passenger trips in VIA’s entire network. It has steadily increased 30% over five years, from 3.6 million in 2015 to 4.7 million in 2019, which can be attributed to a combination of factors including:

- Increase in services between Toronto to Ottawa;
- Increase in seat capacity on the busier routes; and
- Targeted marketing through the adoption of a customer relationship management program.

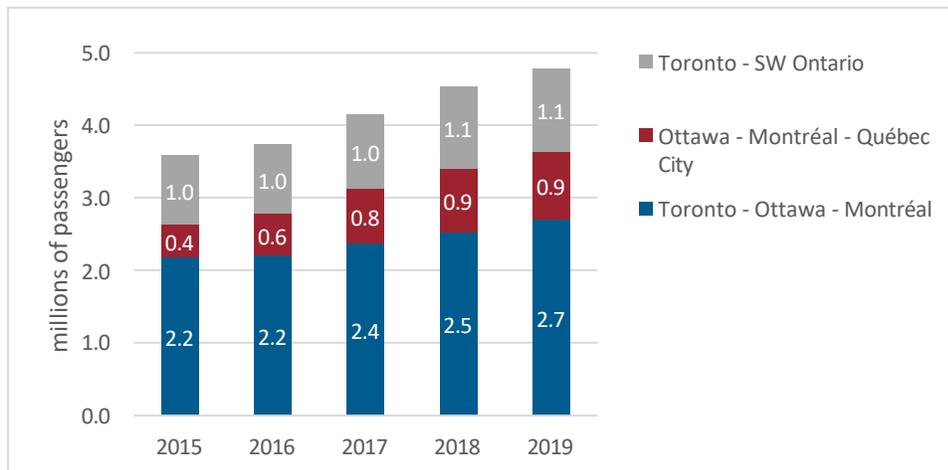


Figure 5 Corridor ridership has increased between 2015 and 2019 (Source: VIA Rail Annual Reports)

Revenues in the Corridor totaled \$325 million in 2019, accounting for 79% of all passenger revenue across VIA Rail. Corridor revenues have steadily increased from \$226 million in 2015 to \$325 million in 2019, which is attributed to both an increase in ridership, and an increase in yield with the application of a revenue management system. Operating costs for the Corridor have also increased from \$380 million in 2015 to \$470 million in 2019.

VIA requires an annual government subsidy to offset operating costs (Figure 6). The annual subsidy for the Corridor has remained between \$140 million and \$150 million over the past five years. In 2019, the Corridor required a subsidy of ~\$145 million or approximately \$30 per Corridor passenger.

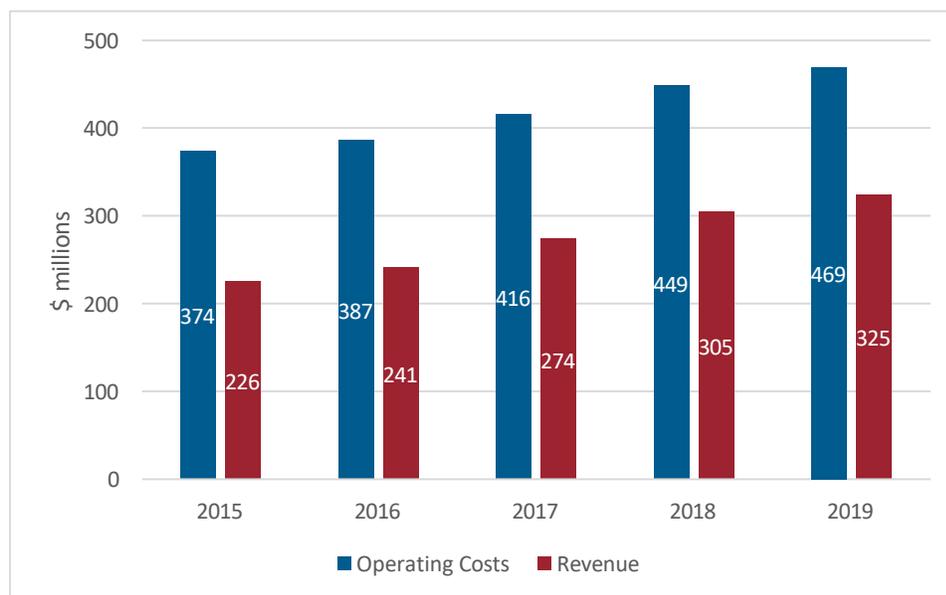


Figure 6 Corridor revenue and operating costs have increased between 2015 and 2019
(Source: VIA General Ledger)

VIA Current Capital Investments

With funding from the Federal Government, VIA is investing \$1.5 billion in a fleet replacement and maintenance program of 32 trains to replace the current BAU/local fleet. The first trains are planned to arrive in 2022. VIA has further identified \$500 million in its capital plan to be invested in initiatives across its owned track and information technology infrastructure, maintenance center improvements, and repair and upgrade of stations.

The 2021 Federal Budget announced \$491 million to be used by VIA for targeted investments to improve capacity to enhance train services on BAU/local routes and CN infrastructure. These targeted investments will be used by VIA over six years to support the overall success of the HFR project.

4. Opportunity and Vision

HFR provides an opportunity to transform the travel experience between the major cities across Canada's mega region through modern, resilient, and sustainable rail service; while supporting Government priorities, including economic development, social and environmental benefits.

4.1. Government Priorities in *Transportation 2030*

The Government of Canada has outlined priorities and aspirations for the future of transportation in Canada in *Transportation 2030: 'A Strategic Plan for the Future of Transportation in Canada'*, the following key themes relate to the HFR opportunity:

- The Traveller: To provide travelers with: greater choice, better service, lower costs and enhanced rights;
- Safer Transportation: To build a safer, more secure transportation system that Canadians trust;
- Green and Innovative Transportation: To improve Canadians' lives by reducing environmental impacts, including air pollution, and embracing new, more sustainable technologies; and
- Trade Corridors to Global Markets: To improve the performance of our transportation system to get products to markets and grow Canada's economy.

4.2. Government Priorities in *Infrastructure 2050*

Since 2016, the Government of Canada has committed over \$180 billion in federal funding for infrastructure projects across Canada in its 12-year *Investing in Canada Plan*⁴. The plan is designed to achieve the following three objectives:

- Jobs & Growth: Promoting economic growth and competitiveness through the creation of 100,000 new jobs each year and an increase in Canadian GDP;
- Sustainable & Resilient: Tackling climate change and increasing resiliency by committing billions of dollars towards projects promoting clean water, strong energy grids, and reducing GHG emissions; and
- Inclusive & Accessible: Improving social inclusion and quality of life for all Canadians.

To build on this 12-year plan, the Government of Canada has committed to conducting a *National Infrastructure Assessment (NIA)*⁵. The following key themes of the NIA relate to the HFR opportunity:

- Clean energy systems & net-zero emissions: To consider the infrastructure needed for a transition towards a net-zero economy by the year 2050;

⁴ Investing in Canada Plan: <https://www.infrastructure.gc.ca/plan/placemat-tableausynthese-eng.html>

⁵ <https://www.infrastructure.gc.ca/nia-eni/index-eng.html>

- Mobility of people & goods: To consider how infrastructure investments improve access to affordable, clean, safe, and efficient transportation options; and
- Quality, architecture & barrier free designs: To consider how well-designed infrastructure maximizes the benefits of each asset by improving its usefulness and extending its life.

4.3. Vision

HFR is intended to deliver modern rail infrastructure, stations, rolling stock, and rail systems with capacity that can scale with the future growth in demand for intercity rail. HFR is an opportunity to invest in a broader vision that builds a better future for Canadians by:

- Advancing the public interest including respecting Indigenous interests, improved safety, and optimizing financial commitment from Government, and aligning with provincial priorities;
- Enhancing the passenger experience with a new intercity rail service operating at higher speeds, higher frequencies, and greater reliability;
- Achieving greater connectivity for people living in major cities and communities between Toronto and Québec City;
- Reducing the environmental footprint with a reduction in Greenhouse Gases (GHG), improved sustainability;
- Supporting economic growth by creating new employment opportunities in infrastructure and bringing people closer to markets, businesses and activity;
- Promoting a competitive marketplace that gives Canadians more flexibility and affordable options for intercity travel; and
- Increasing equitable access to passenger services for all people regardless of physical ability or socio-economic background.

4.4. Project Opportunity

The HFR project is intended to be compatible with the overall themes in Canada's transportation strategy. HFR is a long-term investment in intercity rail that can deliver:

- Increased frequencies connecting Canada's major cities that provide travelers with greater flexibility and choice;
- Lower journey times that can attract higher ridership from other modes of transportation, in particular private vehicles, and provides a safer and more reliable service for travellers;
- Improved integration with the wider transportation network and other transport modes with connections to local and regional transit services and airports;
- An opportunity to deliver better on-time performance;
- A reduction of greenhouse gases emitted by operations of intercity rail;

- An attractive and reliable alternative to private vehicle and air travel across the corridor - allowing for productive time and a sustainable travel option for passengers;
- Creation of new skills and employment during the build, maintenance, and operations of HFR. During the construction phase of the project, an estimated 71,000 – 96,000 annual equivalent jobs could be created;
- Improvement in productivity of the region through connections between major employment hubs, business centres, universities, and major tourism destinations- bringing people and places closer together;
- An opportunity to increase revenues compared to a business-as-usual scenario over a 30 year period, assuming fares are unchanged in real terms at 2019 VIA Rail fare levels; and
- New and rebuilt infrastructure for ~90% of the alignment provides lasting benefits and furthers the resiliency of the service offering offered to passengers. HFR will deliver modern rail infrastructure and systems with capacity that can scale with the future growth in demand for intercity rail.

5. Project Definition

5.1. What is High Frequency Rail?

HFR is a proposed 1000+ km intercity rail line with new tracks, structures, stations, rail systems, and rolling stock that can be delivered under a DBFM or DBFOM Public Private Procurement model.

The HFR infrastructure will enable new train services between Toronto and Québec City, and complements the existing service offering between Windsor and Québec City. Both Local and HFR services are currently envisaged to be part of a combined Corridor operating entity. The conceptual service offering and timetables are discussed in further detail in Sections 9.2 and 9.3.

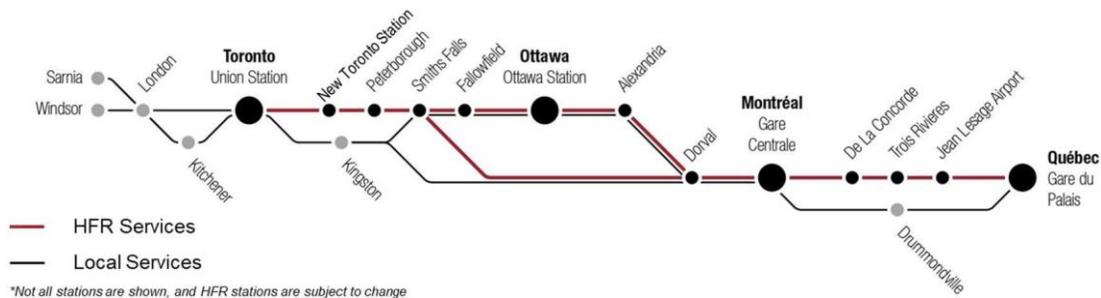


Figure 7 Network map of HFR and local services

The HFR project will broadly require:

- Construction of new and upgraded tracks along VIA, host railway, and new right-of-way (ROW), structures, stations, maintenance facilities, and rail systems (including electrification) and procurement of new rolling stock to enable a faster, more frequent, and resilient intercity rail service;
- Collaboration with host railway owners (including CDPQ, CN, CP, EXO, Québec-Gatineau Railway (QGRY), and Metrolinx) to facilitate track access on shared passenger and freight corridors and the approaches to major urban centres; and
- Selection of a private partner to deliver the design, construction, financing, maintenance, and / or operations of the new HFR service.

Figure 8 is a schematic map that provides an overview of the current project definition across the lenses of alignment, city access, technology, and procurement. Each of these elements is discussed in further detail in the following sections.

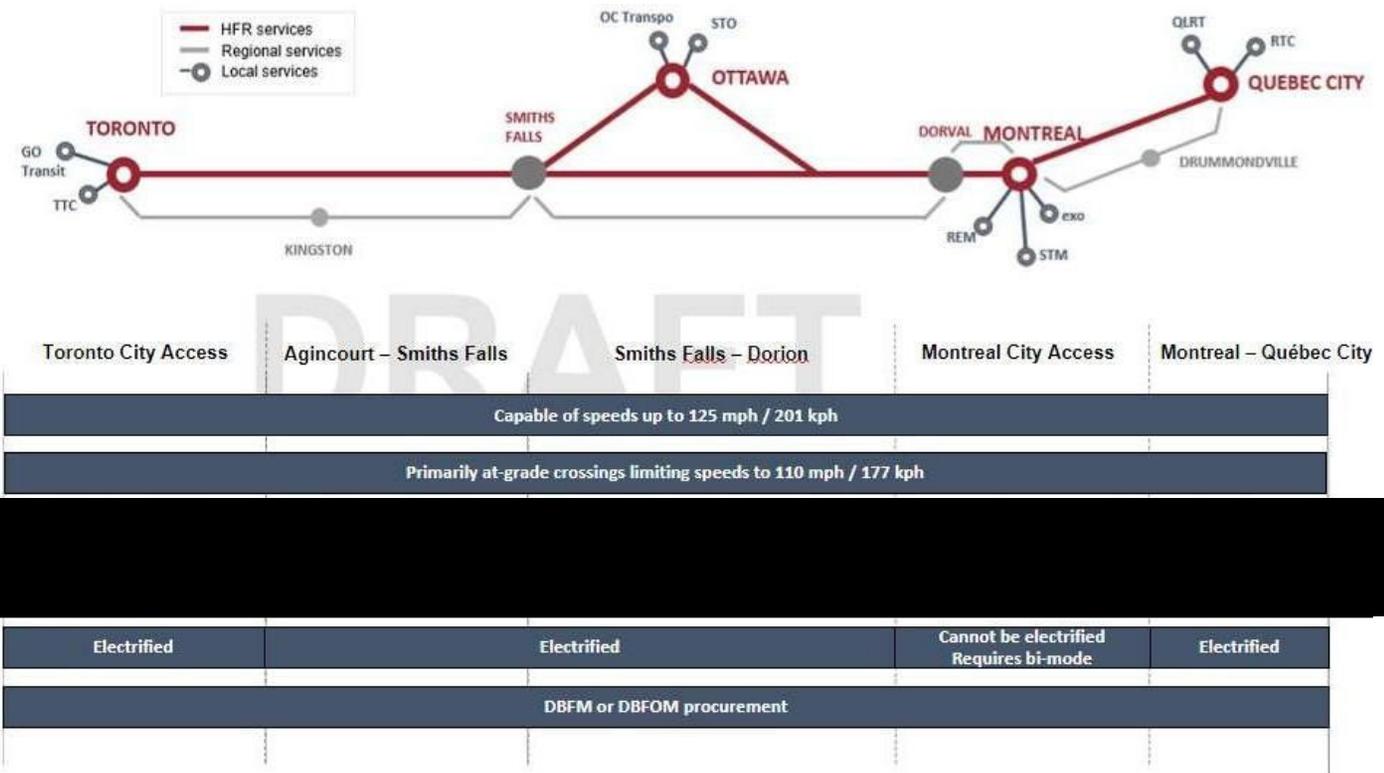


Figure 8 HFR Schematic

5.2. Selected Alignment

The JPO was tasked to review and optimize alignment options and to develop new routes between Toronto and Québec City. The alignment options were screened with the facts and evidence presented in July 2020, using a multi-criteria analysis (MCA) that evaluated each option against a range of criteria, such as Financial, Engineering, Social and Environmental considerations.

The alignment is further discussed in the following two subsections:

- Toronto – Ottawa – Montréal
- Montréal – Québec City

5.2.1. Toronto – Ottawa – Montréal

The JPO previously assessed various alignments to develop a range of options in the Toronto – Ottawa – Montréal section. This project considers an alignment that follows an existing CP and former freight rail corridor between Toronto, Peterborough, and Smiths Falls. It is an optimized version of the alignment developed through 2016-2018 with curve corrections to increase speeds. It also includes an additional segment between Smiths Falls and Montréal through an existing CP freight corridor. The additional segment enables direct services between Toronto and Ottawa, and Toronto and Montréal.

The alignment was selected based on the July 2020 comparison of the alignment options, using the information and data available at that time, in which the selected alignment:

- Presented a balanced option for both improvements in travel time and capital expenditure;
- Serves the city of Peterborough and connects it to the rest of the cities in The Corridor; and
- Presented the most favourable indicative NPV when compared to the other alignments under consideration in Q2 220.

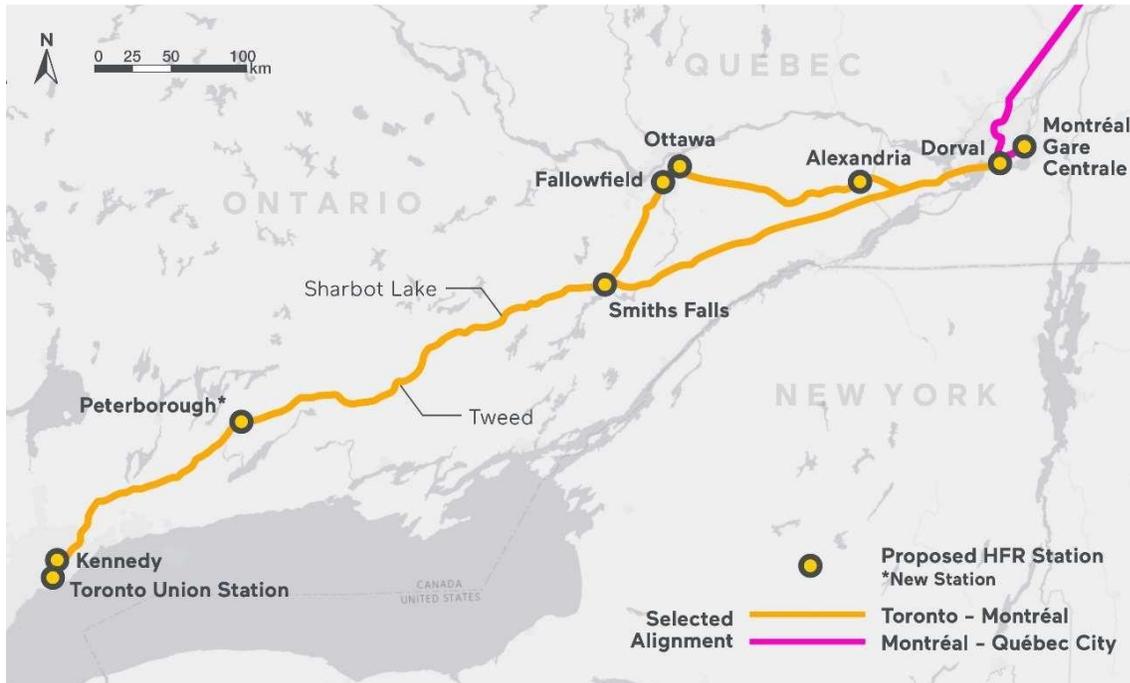


Figure 9 Proposed alignment from Toronto and Montréal

5.2.2. Montréal – Québec City

The proposed alignment between Montréal and Québec City uses the existing Québec-Gatineau Railway (QGRY) corridor north of the St. Lawrence River. The proposed alignment allows for improved journey times between Montréal and Québec City. The chosen route provides intercity rail service to Trois-Rivières and improves its connection to cities along the rest of The Corridor. The route also includes a station near Jean-Lesage Airport.

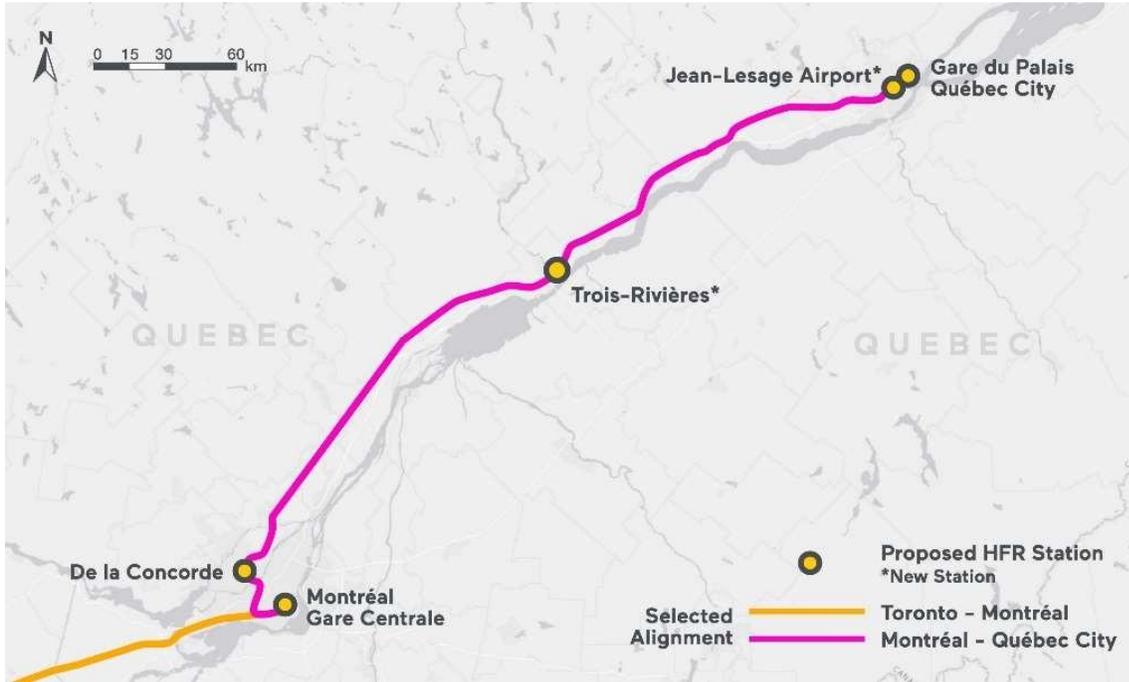


Figure 10 Proposed alignment from Montréal and Québec City

5.3. City Access

The JPO is in early discussion stages to outline and define the nature of infrastructure requirements and the type of development, access, and operating agreements needed with host railways for access in Toronto, Montréal, and Québec City, where there is the interface between HFR and other freight or regional transit operators. The focus to date has been on Toronto and Montréal, as they carry the most complex challenges with regards to bringing HFR to these major nodes - in particular, with regards to capacity, future proofing, and on-time journey performance aspects through either shared track or stations owned and operated by others.

5.3.1. Toronto

Toronto city access presents challenges and constraints to overcome, with respect to available capacity, due to the amount of mixed rail traffic on the shared track. As such, focus and effort has been expended to assess de-risking measures and optimization opportunities to access Toronto. From its mandate, the JPO has focused its due diligence on Toronto Union Station.

The current proposal for Toronto access is to use Toronto Union Station, via the Uxbridge Subdivision. Currently, Union Station is the terminal facility for VIA including:

- Intercity trains to Southwestern Ontario (e.g., trains to Niagara Falls, Kitchener, London, etc.);
- Intercity trains to Eastern Ontario and Quebec via Kingston; and
- Long-distance trains between Toronto and Vancouver.

The station, owned by Metrolinx, is also a key hub for the Metrolinx GO train network which provides regional rail services. Metrolinx is currently undertaking a major investment to update its infrastructure and stations to enhance and expand the regional rail network and as a result, increase the daily number of GO trains over the next several years.

For HFR to access Toronto Union Station, HFR would operate on tracks controlled by Metrolinx and their future On-Corridor Private Partner. Coordination of scheduling and commercial agreements will be required between the HFR operator and the On-Corridor Private partner to ensure seamless integration of services for both parties. Further due diligence is being undertaken to ensure that the scheme to access Toronto meets the required service levels for HFR, as discussed in Section 10.1.1, as the existing proposal from Metrolinx does not provide enough time slots and frequencies for HFR Service Level 1.

5.3.2. Montréal

The current proposal for Montréal access is for HFR to use Gare Centrale, via the Montréal Subdivision, as its Montréal terminus station. Currently, the station is VIA's hub for train services including:

- Toronto, Kingston, and Ottawa;
- Québec City via Drummondville;
- Senneterre and Jonquière
- Long-distance trains between Montréal and Halifax; and
- An Amtrak train between Montréal and New York City.

The station, tracks owned by CDPQ and the station owned by Cominar, is also a key hub for regional rail networks with connections to exo and planned for REM. Currently, in order for HFR to access Gare Centrale, HFR would operate on tracks controlled by CN Rail. CN has undertaken capacity studies and has identified infrastructure requirements required to accommodate the proposed frequencies for HFR, further discussed in Section 10.1.1 – should HFR decide to operate on these shared tracks the project would have to assume the CN costs to accommodate HFR. Assessment is required to determine how to protect such investment to ensure passenger priority as the costs make up a significant portion of the overall project CAPEX (see Section 9.1 for details).

5.3.3. Québec City

The current proposal for Québec City access is to use Gare du Palais, owned by VIA, as its Québec City terminus station. Currently, the station is VIA's hub for train services including:

- Local intercity trains to Toronto, Kingston, and Ottawa;

- Local intercity trains to Montréal via Drummondville; and
- Long-distance trains between Québec City and Halifax.

To access Québec City via Gare du Palais, HFR will use CN-controlled track which currently prioritize freight trains. Access and Operating agreements will be required to ensure acceptable on-time performance, and agreeable priority and access schemes.

5.4. Technology

The JPO mandate included analysis with regards to rolling stock propulsion technologies, focusing on a comparison of electrified and diesel. Each technology was assessed in terms of economic and operational benefits where an electrified or partially electrified solution may further benefit key Government of Canada objectives such as advancement of public interest, reduction in environmental footprint, support of economic growth, and enhanced network interoperability.

With Transport Canada's direction HFR will be electrified where the safety case and host railway constraints permit, requiring electrification infrastructure, connections to Hydro utility providers and electrified and/or bi-mode rolling stock.

Electrification brings environmental benefits by eliminating GHG emissions at the train source, provides lower audible noise, may offer increased operational performance due to lower vehicle weights and improved acceleration characteristics, and provides lower operating and maintenance costs compared to diesel equivalent vehicles.

As the currently proposed alignment shares track and ROW with host railways, correspondence with the host railways has indicated that they oppose electrification on their tracks, and are concerned about interoperability aspects of electrification on HFR tracks in host railway ROW. Some host railways are seeking evidence that electrification would not impact their current and future operations in any way, which will be addressed in the safety case. Further assessment and due diligence is required.

Currently it is proposed that approximately 90% of the HFR alignment could be electrified; this would require a bi-mode trainset which can operate both in electric and non-electric sections of the alignment if the remaining 10% cannot be electrified due to host railway constraints. The secondary traction power mode of a bi-mode rolling stock could be battery or diesel technology.

Building and maintaining an electrified intercity railway would create a new industry, a new supply chain, and the need for skilled employment, as well as opportunities during the construction phase for the creation of an electrical supply backbone for HFR. Having electrified rolling stock for HFR also maximizes the potential benefits and interoperability with future Metrolinx On-Corridor GO electrification. Further details on Electrification are outlined in Section 10.2.

5.5. Procurement

The October 24th, 2019 DMOC meeting provided direction to the JPO to assess and develop fully implementable DBFM and DBFOM options to deliver the HFR Project. The JPO assessed five different variants of the DBFM and DBFOM procurement options on the basis of budget certainty to the government over the life of the contract, and in terms of retained risk by the public sector and risk transfer to the private sector away from the public sector.

The JPO assessed two availability based DBFM procurement models:

- DBFM #1 – Maintenance of civil and infrastructure works, signalling, and systems are transferred to the private sector. The public sector continues to maintain the rolling stock and maintenance yards, is the operator, and manages revenue risk.
- DBFM #2 – All maintenance activities (including rolling stock and maintenance facilities) are transferred to the private sector with the public sector retaining all operational activities and revenue risk.

The JPO assessed three DBFOM procurement models:

- DBFOM # 1 – All maintenance activities plus operations including Train (Locomotive Engineers and On Train Staff), On Board Products, and Station Operations are transferred to the private sector with the remaining operations and revenue risk retained by the public sector.
- DBFOM #2 – In addition to the basic operations in DBFOM#1 above, Network Planning & Dispatching, Availability of IT Systems, Customer Service Centers are transferred to the private sector with revenue risk retained by the public sector.
- DBFOM #3 – In this option, all maintenance activities and operations, including revenue risk, are transferred to the private sector with policy, regulatory / standard setting, contract management, corporate strategy related activities retained by the public sector.

To date, the project alignment has been defined not to preclude the procurement of the project by the assessed DBFM or DBFOM models. It is important to note that a project definition that is too specific may impact the procurement in terms of private sector innovation and efficiencies. This Project Update provides an outline of the procurement options assessed. The shortlisted procurement options are as follows: DBFM #1, DBFOM #3 (with DBFOM #2 as a fallback option).

5.6. Futureproofing

HFR can be progressed and built on the proposed alignment; the definition of this corridor sets the foundation for future HFR operations and the ability to achieve long-term Government objectives. The HFR project has been defined to date based on key parameters – summarized in Table 6 – that influences futureproofing for speed, capacity, safety, and the environment. The JPO has considered optimizations that could further support long-term Government objectives; these are discussed in further detail in the Optimization addendum.

Table 6 Futureproofing key parameters table

Theme	Description
Speed	The HFR alignment and track curvature is designed to enable speeds of up to 201 kph (125mph). As HFR is currently proposed with at-grade crossings, HFR will operate at speeds up to 177kph (110mph). However, the use of impenetrable barriers, if approved by Transport Canada, or grade separations of rail/road crossings plus an alternate vehicle would be required to achieve speeds up to 201kph (125mph) ⁶ . Further discussion on requirements to future proof for speeds are discussed in the Optimization addendum.
Capacity	<p>Within the intercity segments of the alignment, HFR is planned with a mixture of single and double track sections that provides HFR resiliency to meet Service Level 3 demand and frequencies (i.e., the highest identified HFR frequencies within the 30-year period based on the reference rolling stock). Double tracking provides greater operations and maintenance flexibility and aids in facilitating growth in demand over 30+ years from when HFR comes into revenue service.</p> <p>On the City Access segments, existing and future capacity is constrained with interface with host railway trains. The JPO will work closely with host railways to identify solutions that achieve the infrastructure and capacity requirements for HFR to serve Toronto Union Station, Montréal Gare Centrale, and Québec City Gare du Palais. The JPO has considered alternate station locations as a potential approach to provide capacity for HFR if Union Station does not work for Service Level 1, and to futureproof for additional city access capacity requirements. These are described in the Optimization addendum.</p> <p>Technology can support with the optimization of capacity. Selection of alternate rolling stock may enable optimization of capacity, performance, accessibility, frequencies, and operating cost. HFR currently proposes to use Enhanced Train Control which could aid in allowing more utilisation of the infrastructure asset, enhancing capacity and speed.</p>
Safety	HFR proposes to use Enhanced Train Control which benefits safety through automatic train protection. The system can also be interoperable with other potential host railway operators.
Environment	<p>HFR as currently proposed enables approximately 90% of the alignment to be electrified. The electrification of HFR supports Government commitments to the reduction of greenhouse gas emissions and improved sustainability – including the goal of achieving net-zero emissions by 2050.</p> <p>Electrification of the remaining 10% of the alignment would advance HFR towards meeting the net-zero target and would reduce the amount of carbon offsets that would need to be bought. Optimizations that could enable full electrification are discussed in the Optimization addendum.</p>

⁶ The VIA Rail – Corridor Fleet Renewal Program Master Service Agreement with Siemens stated that the Siemens Charger with a conceptual Electric Power Car could achieve 125mph. Verification and assessment is needed on the most appropriate rolling stock for HFR.

6. Strategic Case

HFR is an opportunity to transform intercity rail travel and build a stronger economic and sustainable future for Canada. Investment in a high frequency rail corridor between Toronto and Québec City can deliver lasting infrastructure with long-term value in the nation’s most densely populated region. This Strategic Case discusses the benefits of HFR with a focus on the selected alignment.

6.1. Enhancing the passenger experience

HFR could have the potential to transform the passenger experience with improved journey times, additional frequencies, and better reliability for intercity rail connections between Toronto, Ottawa, Montréal, and Québec City. In addition, new rolling stock, new and upgraded stations can reshape the customers experience of train travel in the region and provide a viable alternative mode of travel to existing options.

HFR is planned to improve journey times between the major cities in the Corridor compared to today’s rail service offering. The current HFR alignment is planned for a maximum operating speed of 177 kph (110 mph), limited by current regulations for intercity rail movements across at-grade road crossings. Optimization and de-risking work continue on the alignment, with a focus on infrastructure improvements that could facilitate journey time reduction and on-time performance reliability.

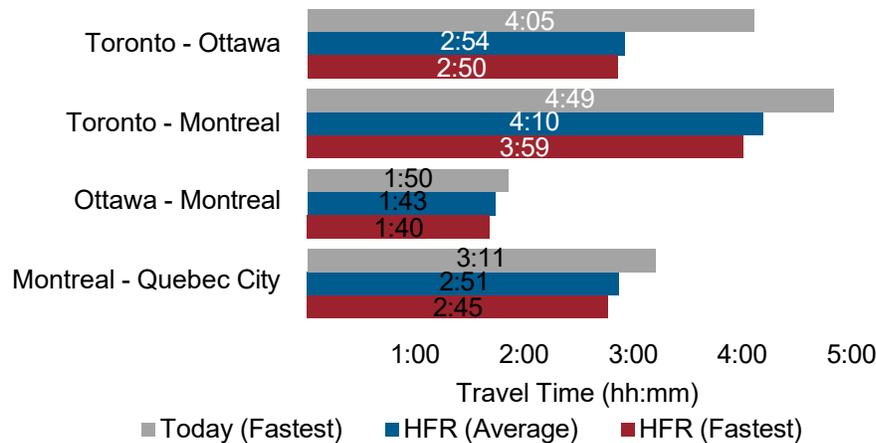


Figure 11 Current and planned scheduled journey times between major cities⁷

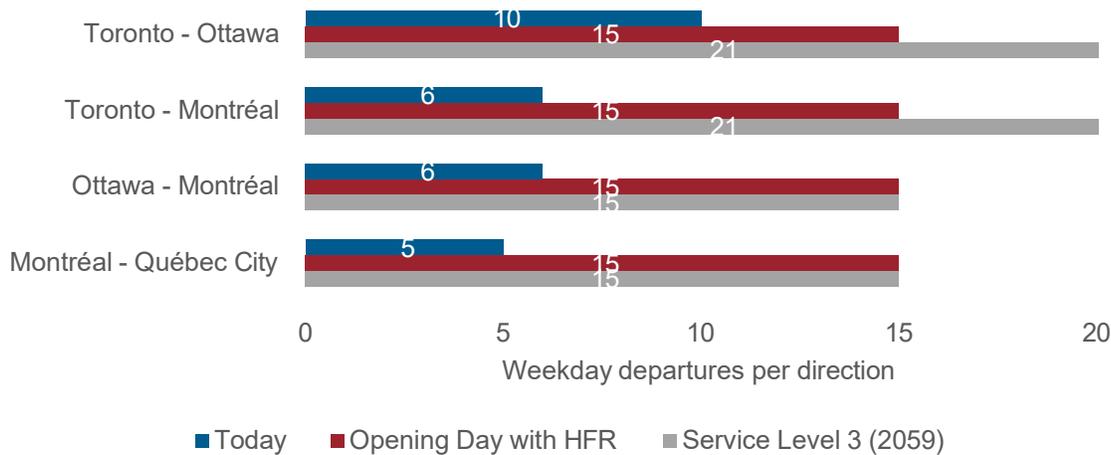
Service reliability and on-time performance is also an important factor to the passenger experience. Today, VIA’s intercity services arrive within 15 minutes of the scheduled arrival time 67% of the time.

⁷ Note: Times are preliminary estimates subject to further due diligence.

- Average time is the mean of all scheduled services on the route.
- Fastest time is based on the service with the shortest scheduled duration.

HFR is planned to provide more daily passenger train frequencies between the major cities across the Toronto and Québec City corridor. This will give passengers more options and greater flexibility. On opening day, there could be a total (combined HFR and local) of 15 train departures per day or a train every 90-120 minutes each weekday (Figure 12). New track infrastructure can support additional HFR train departures for Toronto – Ottawa and Toronto – Montréal routes with up to 18 HFR train departures planned within the first 30-year concession period. Beyond the first 30-year period, ridership is expected to continue to grow, and additional train departures may be required to meet demand. Further due diligence and discussions with host railways are required to ensure that HFR service levels are achievable.

Figure 12 Number of total trip frequencies between major routes today vs in the future with HFR⁸



⁸ Today: Based on VIA Rail Timetables, effective Jan 2020 (prior to COVID-19), Future: Planned local and HFR departures on opening day

6.2. Achieving greater connectivity

Historically, public transportation infrastructure within the corridor has focused on a local need rather than being considered as a fully integrated transportation system with strong intercity transportation connections. A key missing link has been a frequent and resilient intercity rail service that consistently performs to on-time arrival and departure expectations. HFR is planned to bring greater connectivity across the region by serving new communities, regions and integrating HFR to other transportation modes.

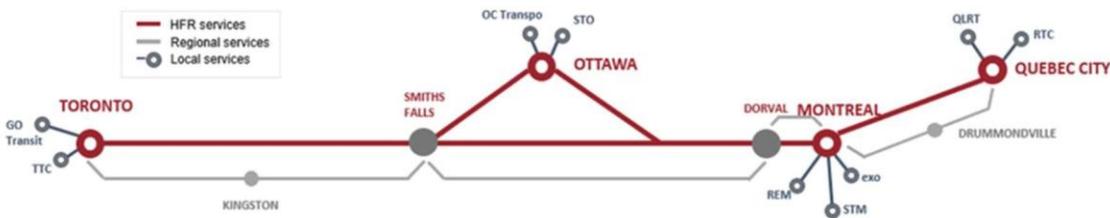


Figure 13 Proposed passenger rail network map with HFR

Through the selected alignment, HFR is planned to provide intercity rail services to more communities, such as Peterborough, which has a population of 84,000, and Trois-Rivières, which has a population of 137,000. By serving and connecting to new communities and regions, HFR enables greater connectivity between people and places across the HFR corridor. HFR is planned to also benefit the communities across the Southwestern Ontario region, including London, Sarnia, and Windsor. With a connection through Toronto, HFR lowers the overall journey times and increases options to travel through to Ottawa, Montréal, and Québec City.

HFR will complement the existing local rail services that would continue to operate in the corridor. With key interchanges between HFR and other forms of transportation in the region (Table 7), HFR can be the foundation of a sustainable transportation system that connects with local and regional transit networks and increase the overall accessibility and attractiveness of HFR to a wider population.

Table 7 HFR connections to other transport modes

Station	Local Commuter and Light Rail	Long Distance Rail	Airport
Toronto Union	✓	✓	X
New Toronto	✓		X
Ottawa	✓		X
Dorval	✓ ⁹		✓
Montréal	✓ ³	✓	
De La Concorde	✓		
Jean Lesage			X
Québec City	✓ ¹⁰	✓	

✓ - Direct Connections | X - Indirect Connections

HFR will also provide rail connections between city centers and airport hubs to deliver improved connectivity and access to longer-distance markets for both residents and visitors to Canada. HFR will provide two new connections to airports in the Corridor, connections to Québec City Jean-Lesage International Airport, and Montréal-Trudeau International Airport (Table 8). Additionally, HFR will indirectly connect to other airports in the Corridor through connections to the greater transport network.

Table 8 Journey times to from stations to major airports

City (Station)	Annual Air Passengers	Journey Time to Airport (min)		
		Car*	Public Transit*	HFR
Montréal (Gare Centrale)	20,305,106	20-30	40	17
Québec City (Gare Du Palais)	1,774,871	20-30	70	13

*represents pm peak hour journey times from existing train station to airport terminal. Source: Google maps

⁹ REM (proposed)

¹⁰ Québec City Tramway (proposed)

6.3. Reducing greenhouse gases and supporting sustainability

The HFR project presents an opportunity for Canada to start to restore the social, economic, and environmental balance for intercity travel within the Corridor. It further supports the Government initiative for Canada to be net-zero by 2050 while also contributing towards the priorities outlined in the Federal Sustainable Development Strategy. Thus, HFR would not only benefit Ontario and Quebec but would also help Canada meet its overall targets for reducing emissions.

Through electrification of the alignment, HFR would further support the reduction of greenhouse gas emissions. HFR would provide lower average emissions per train (Figure 14) compared to business-as-usual operations. Preliminary findings indicate that over 30 years, HFR could provide a 10.2 million tonnes reduction of CO₂ equivalents compared to a business-as-usual scenario with today's existing fleet of diesel trains. This reduction is based on approximately 90% electrification of the alignment; host railways have suggested that full electrification of the current alignment proposals would create operational and maintenance concerns for host railways on certain segments of the shared corridors. Greenhouse gas emissions could be further reduced should HFR be able to achieve 100% electrification across the alignment.

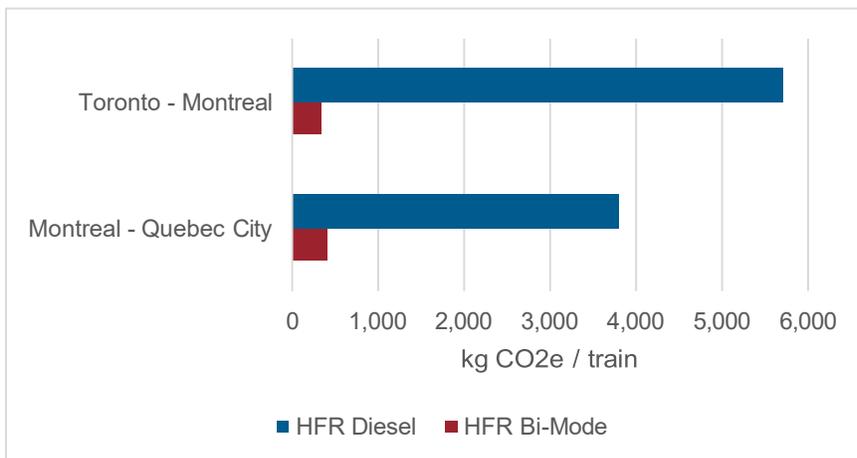


Figure 14 Average emissions per single HFR train by route

HFR is planned to support Canada's sustainable development priorities by delivering climate-resilient infrastructure and by avoiding adverse effects on the natural environment. This will contribute towards the priorities outlined in the 2019-2022 Federal Sustainable Development Strategy which includes:

- Greening government – HFR is an opportunity to reduce greenhouse gas emissions emitted when compared to business-as-usual operations.

- Modern and resilient infrastructure – HFR is an opportunity to improve the resilience of existing rail infrastructure and can be designed to be resilient to the impacts of climate change.
- Safe and healthy communities – HFR is planned to encourage modal shift from driving and flying to rail, which lowers air pollution emissions, noise, and number of passenger vehicle collisions.
- Healthy wildlife populations and pristine lakes and rivers – The planning for HFR will consider avoiding or reducing potential adverse effects on the natural environment, where reasonably possible. Where adverse effects cannot be avoided, mitigation measures will be identified through the Impact Assessment for the project.

6.4. Supporting economic growth

HFR is an investment in Canada’s economy by improving productivity, supporting tourism, encouraging transit-oriented development, connecting major business, manufacturing, and finance centres, and creating jobs across the Corridor.

Increase regional productivity – HFR is planned to serve the most populous region of all Canada, which contributes to over 40% of the national GDP.¹¹ By 2043, an additional five million people, an increase of 21% from 2020, will call Quebec and Ontario home,¹² necessitating investment in sustainable intercity transport to support growth and economic activity. HFR can support regional productivity by making it easier to travel across the major communities, regions and through connecting the major cities in the Corridor. – enabling more productive time while traveling, connecting hubs of economic activity, and linking many of the region’s largest centres of higher education.

Supporting tourism – Tourism is Canada’s largest service industry and represents two percent of the national GDP.¹³ Both Toronto and Montréal account for two of the three top-earning tourism regions in the country.¹⁴ With faster and more reliable service between cities, HFR could support increased tourism across the Corridor. Decreasing travel time results in rail becoming a more viable option for leisure travel and in particular for tourists planning to visit multiple Canadian cities, which would, in turn, promote further tourism across the region, including destinations that are currently less visited.

¹¹ Statistics Canada – Table 36-10-0468-01

¹² Statistics Canada (2019). Population Projections for Canada (2018 to 2068), Provinces and Territories (2018 to 2043) (91-520-X). Available at: <https://www150.statcan.gc.ca/n1/pub/91-520-x/2019001/sect03-eng.htm>

¹³ Statistics Canada – Table 24-10-0042-01

¹⁴ Statistics Canada – Visitor travel survey 2019 <https://www150.statcan.gc.ca/n1/daily-quotidien/190827/dq190827a-eng.htm>

Transit-oriented development – The proposed HFR alignment allows for new rail stations and transit hubs. These stations present opportunities for transit-oriented development (TOD) integrated within new communities, and cities. There are potential opportunities to use available lands at or adjacent to HFR infrastructure for TOD that integrates new residential, mixed use, and/or commercial development with rail. The JPO has not explored or financially evaluated these opportunities; however, potential TOD opportunities could be explored through the project or by third parties at or adjacent to the corridor.

Creating Jobs – HFR is an important investment for Canada, in the order of magnitude of \$19.6 to \$36.7 billion for the selected option. This investment is planned to generate economic activity and job creation in various sectors that span the entire project lifecycle from pre-procurement activities to operations and maintenance. Over the entire lifecycle of the project, HFR would create new jobs and opportunities for Canadians during the design, construction, and operation & maintenance phases of the project. HFR could generate between 71,000 – 96,000 total annual equivalent jobs over the construction period.¹⁵

6.5. Promoting a competitive marketplace

HFR provides a more competitive travel mode, providing passengers with more options and greater flexibility for intercity travel between Toronto and Québec City. Reducing travel times and transforming the passenger experience makes HFR an attractive alternative for intercity travel, increasing competition within the transport market in the Corridor.



Figure 15: In-vehicle journey times between Toronto and Montréal for various transportation modes¹⁶

¹⁵ Refer to the Economic Case Section 7

¹⁶ In-vehicle travel times between City Centre to City Centre, except air which excludes transit times
Sources: Rail (HFR) – JPO Analysis; Rail (Local) – VIA Rail Timetables (Jan 2020, prior to COVID-19)
Car, Air – Google Maps

6.6. Advancing the public interest

HFR is planned to advance the public interest by achieving better passenger, economic, and environmental outcomes. HFR also supports the public interest by enabling safer intercity journeys, respecting Indigenous interests, optimizing financial commitment from Government, and aligning with Provincial priorities.

- Respecting Indigenous interests: The JPO is progressing the Crown's duty to consult by facilitating enhanced relationships with Indigenous stakeholders and communities. The selected alignment is not proposed on reserve lands. However, many segments of the alignment cross Indigenous Traditional Territories and Treaty Areas. Some sections of the alignment also cross Land Claims Areas currently in negotiation with the provincial and federal governments.
- Enabling safer intercity journeys: HFR is planned to deliver new infrastructure, new rolling stock, and modern rail systems that will enable safer intercity rail journeys with greater segregation between passenger and freight operations, including the implementation of enhanced train control following an approach set out by Transport Canada for this technology.
- Reducing impact of motor vehicle collisions: HFR is planned to reduce the overall vehicle kilometres travelled on highways between Toronto and Québec City, and in turn, reduce the impact of motor vehicle collisions on human life and society.
- Minimizing risk and financial commitment: Existing VIA intercity services in the Windsor – Québec City corridor require an annual subsidy of \$140-150 million. HFR is planned to attract ridership and increase revenue; further work will focus on the risk borne by the public and private sectors with the objective of lowering the overall ongoing financial commitment from the Government.
- Aligning with Ontario's priorities¹⁷ – HFR aligns with the Ministry of Transportation's focus on these key priorities:
 - Improving the transit experience: with new infrastructure that serves communities and regions across the province;
 - Promoting a multi-modal transportation network: that supports the province's economic competitiveness by strengthening connections between intercity rail and local transit; and
 - Keeping Ontario's roads safe and reliable: by promoting travel alternatives to cars and lowering overall congestion on Ontario's roads.

¹⁷ Ministry of Transportation Key Priorities: <https://www.ontario.ca/page/published-plans-and-annual-reports-2019-2020-ministry-transportation>

- Aligning with Quebec’s priorities¹⁸ – HFR aligns with the objectives in Quebec’s Integrated Mobility Policy including:
 - Bringing mobility to serve the public and improving road safety through journey time reductions and providing an alternative to cars for intercity travel;
 - Creating mobility with a smaller carbon footprint through modal shifts reducing petroleum consumption and reducing GHG emissions; and
 - Using mobility to support a stronger economy by reducing costs associated with congestion.

¹⁸ Quebec’s Integrated Mobility Policy: <https://www.transports.gouv.qc.ca/en/Documents/PMD.pdf>

7. Economic Case

7.1. Introduction

This section sets out the status of the economic appraisal for the HFR project. With direction from Transport Canada, electrification of HFR has been assessed in the economic case.

7.2. Economic Appraisal Assumptions

The economic appraisal makes use of assumptions and parameters such as the social discount rate, value of time, and value of external impacts, which are taken from a combination of Metrolinx and MTQ guidance. Input data that supports this analysis is based on the ridership and revenue forecasts completed on the selected alignment (i.e., version 58 dated July 2021).

Outputs in this section are presented as the economic benefit and costs (in present value terms) totaled over a 30-year evaluation period¹⁹. Results in this section related to economic benefits and ridership are presented as a range of +/- 15%.

7.3. Costs Estimates

The cost estimate to deliver the HFR project are divided into two categories:

- Capital Costs (Capex) are fixed one-time costs incurred during the development and construction of the project.
- Operating and Maintenance Costs (Opex) are ongoing costs required to operate the service, provide day-to-day maintenance, and complete major rehabilitations throughout the lifecycle of the project.

Within the economic appraisal conducted, costs are presented as incremental to a business-as-usual scenario, representing the additional cost as a result of the HFR project. The Capex and Opex for the project evaluated over a 30-year period are set out as present values (in 2020 prices) in Table 9.

Table 9: Total incremental capex and opex over a 30-year evaluation period

PV Billions of 2020 CAD	HFR
Incremental Capex	19.3 – 26.1
Incremental Opex	6.4 – 8.6
Total Incremental Costs	25.7 - 34.8

¹⁹ It is important to note that the incremental benefit and operational costs associated with HFR would continue beyond the initial 30-year period noted here.

7.4. User Impacts

User Impacts are a key area of analysis for transport investments. They represent how the investment will improve the social welfare of the users of the transport network. This includes existing users of VIA rail who will continue with HFR, those who are currently making journeys in the corridor by other modes, who will switch to HFR, and new users who will travel (or existing users who will travel more) as a result of HFR. The primary user impacts are the monetized journey time savings for existing and new users who benefit from faster HFR journeys compared to today's service offering. Table 10 summarizes current estimates for user impacts over a 30-year evaluation period.

Table 10: User impacts over a 30-year evaluation period

PV Billions of 2020 CAD	HFR
Total Journey Time Benefits	2.3 – 3.1

7.5. External (Societal) Impacts

Auto and airplane trips taken can contribute negative impacts to society through emissions or injuries and deaths that can occur from accidents. These impacts are called external impacts, or the 'social cost of transport.'

External impacts are estimated through the mode choice changes generated by the proposed investment. The external impacts have been calculated for the main monetized externalities:

1. Unperceived Automobile Operating Costs savings – or the costs of driving not taken into account when choosing how to make a journey
2. Decongestion Benefits – calculated through the removal of cars from the road
3. Road Safety Benefits – related to the reduction of car collisions from lower distances travelled by car
4. GHG changes – through reduced driving, flights, and benefits of 90% electrification

Table 11: External impacts over a 30-year evaluation period

PV Billions of 2020 CAD	HFR
Unperceived auto cost	0.5 - 0.7
GHG Reductions	0.32 - 0.44
Decongestion Benefits	0.02 - 0.02
Road Safety Benefits	0.17 - 0.24
Total External Benefits	1.0 - 1.4

7.6. Other Impacts

Two additional benefits were calculated as part of the Impact Analysis:

- The Resource Correction – which accounts for the transfer of fare paid from new HFR users to the operator, and is included as the incremental revenue from new users
- Agglomeration – or the measure of economic benefit from businesses being better connected

These impacts are relatively new to Canadian economic appraisal; the resulting benefits and benefit-cost ratio (BCR) have been reported both with and without these values.

Table 12: Other impacts over a 30-year evaluation period

PV Billions of 2020 CAD	HFR
Resource Correction	5.6 - 7.6
Agglomeration Benefits	0.3 - 0.9
Total Other Impacts	5.9 - 8.5

7.7. Jobs Created

HFR is expected to create jobs during the construction period. While typically not considered as a monetized benefit within the economic appraisal, the number of jobs is presented here as a supplemental economic impact of investing in HFR. Two numbers have been calculated based on the overall capital cost and Canadian/US benchmarks for the rate of direct jobs²⁰ per dollar of capital investment:

- The Change in Annual Equivalent Jobs – the average number of jobs the project will support during each year of construction
- The Maximum in one year – or the number in the year of highest spend

Table 13: Number of direct jobs created during HFR construction

PV Billions of 2020 CAD	HFR
Annual Equivalent Jobs	71,000 - 96,000
Maximum Jobs in one year	27,500 - 37,200

²⁰ Job estimates presented here are based on the capital costs, and only include direct construction jobs. This does not include the supply chain, or operations and maintenance employment.

7.8. Impact Results

The total benefits and costs evaluated over a 30-year period are compared to generate a benefit-cost ratio for the project. An indicative expanded BCR is presented which includes other impacts (e.g., resource correction and agglomeration). Table 14 shows the overall impact results for the current alignment:

Table 14: Indicative total benefits and costs over a 30-year evaluation period

PV Billions of 2020 CAD	HFR
Journey Time benefits	2.3 – 3.1
Total External Benefit	1.0 - 1.4
Total Incremental Costs	25.7 - 34.8
Indicative Benefit - Cost Ratio (BCR)	~0.13
Total Other Impacts	5.9 - 8.5
Indicative Expanded BCR	~0.4

The results of the Economic Case are preliminary and reflect the current progress on the focus alignment. Further design and analysis by the JPO will refine these results further.

These results should be reviewed in the context of the Project's Strategic and Financial Cases, which presents a wide range of strategic and policy objectives that can be supported by the Project.

8. Procurement Case

Overview

Selecting an optimal delivery method is one of the most important decisions made by the public sector when procuring infrastructure projects. For the VIA HFR Project, the JPO has the mandate to thoroughly assess two implementable procurement options (DBFM and DBFOM) for the Project.

The associated procurement research workstream involves 4 stages.

- Step A: Overview of procurement options (Completed)
- Step B: Case studies to support procurement options (Completed)
- Step C: Shortlist of procurement options with HFR overlay (Completed)
- Step D: Final analysis of the shortlisted options (Completed)

This section addresses materials intended for the Step C deliverables and provides the range of DBFM and DBFOM procurement options that would be best suited to deliver the HFR Project. The analysis does not consider the impact on the remaining role of VIA for out of corridor services.

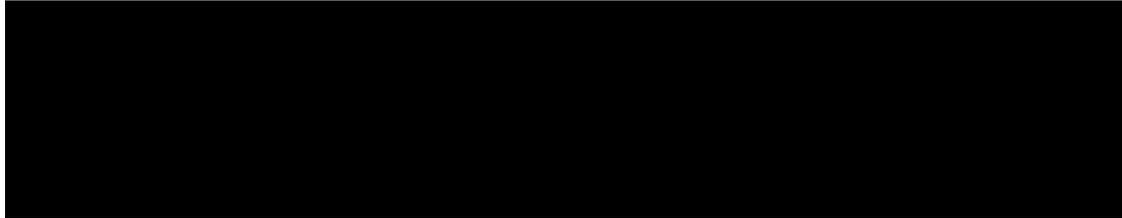
Baseline Assumptions for all Procurement Options.

Unionized Labour

All procurement options assume the continued use of unionized labour for activities that are currently unionized. All cost assumptions use unit rates from current VIA labour agreements. Changes to these agreements will continue to be a retained risk for the government until the Public Private Partnership (PPP) contract start. However, pension liabilities and other long term obligations will be reviewed. Labour transfer to the private sector is fairly common (e.g., Canada Line, ESAP, GO RER, CN and CP) and allows for efficiencies to be achieved through human resource planning, training and scheduling.

Existing Assets

All existing assets owned and managed by VIA Rail will need clear and comprehensive asset condition reports to allow for transfer of maintenance and operating risk transfer. Latent defects for all existing assets will likely continue to be a retained risk for the Government. However, as most assets will have been in operations for decades before the Private Sector takes over, this should not be a concern.



Off Corridor Routes (Canadian, Ocean, and Government mandated regional routes)

While there are numerous interactions between the On and Off-Corridor Services (e.g., Maintenance facilities maintaining the both Corridor and Off-Corridor trains), the focus of this assessment has been on Corridor services and activities. As per JPO's mandate, all current Off-Corridor routes remain with VIA in the scenarios analyzed. Where Corridor O&M activities have been transferred to the Private Sector, specifications and performance regimes for servicing Off-Corridor routes can be included in the contract, resulting in potential fixed price certainty and performance management from the private sector on Off-Corridor routes as well. Alternatively, a shared maintenance facility approach can be utilized.

Horizontal vs Vertical Segregation of Scope

Amongst DBFM and DBFOM options, the main consideration relates to the maintenance and operating scope split during the operations phase between the public sector and the private sector.

Under all DBFM and DBFOM procurement options, Design and Build is assumed to be transferred to the private sector. As procurement options on maintenance and operations get more integrated, they present increased opportunities for the private sector to bring innovation and efficiencies even to design and build of the project.

There are two ways to develop operating period scope split between the public and private sector

- 1) Horizontal scope split based on service offerings: Procurement options include allocating certain Corridor routes to the private sector to manage. Full operating, maintenance, and lifecycle responsibilities associated with the transferred routes reside with the private sector (e.g., Out of Corridor managed by public and In Corridor managed by private sector)
- 2) Vertical scope split based on allocation of maintenance and operational activities: Procurement options include allocating certain aspects of Corridor operating, maintenance, and lifecycle responsibilities to the private sector to manage. The transferred responsibilities will apply to the full Corridor (e.g., Under a DBFM, Operating activities are managed by Public vs maintenance by Private)

²¹ Should HFR require the use of host rail infrastructure.

Efficiencies may be achieved when the Corridor is operated as a single network (to allow for improved fleet utilization and integrated network planning approaches) following a vertical scope split due to the potential to maximize synergies, improve performance and achieve economies of scale. A vertical scope split also alleviates critical interface risk that may arise when the same Corridor is operated simultaneously by two operators.

As a result, all procurement options under DBFM and DBFOM models presented in this section will be based on vertically split activities as described above.

DBFM #1	DBFM #2	DBFOM #1	DBFOM #2	DBFOM #3
Availability	Availability	Availability	Availability	Revenue
Civil / Infrastructure Works & Rail Systems	Civil Works/ Infrastructure, Rail Systems, Facilities and Rolling Stock	Basic Operations	Integrated Operations	Revenue Risk
Maintenance of Track, Stations and Rail Systems	Maintenance of Track, Stations, Rail Systems PLUS Rolling Stock and Maintenance Facilities	Train (Locomotive Engineers and On Train Staff), On Board Products and Station Operations	Basic + Network Planning & Dispatching, Availability of IT Systems, Customer Service Centers	Most operational activities other than policy, regulatory / standard setting, contract management, corporate strategy related activities



Figure 16 Range of procurement options under DBFM & DBFOM

8.1. DBFM #1

8.1.1. Description

Maintenance and lifecycle / rehabilitation activities become responsibilities of the Private Partner, including all civil works (e.g., tracks and structures (new and existing)), Rail Systems (e.g., signaling, communications and electrification (if selected)), and Stations (new and existing owned by VIA, “land or building”). Maintenance and long-term asset management (rehabilitation) activities retained by Public Sector would include Rolling Stock and Facilities (Toronto Maintenance Center & Montréal Maintenance Center). All operational activities would continue to be retained by Public Sector, including dispatching and network planning.

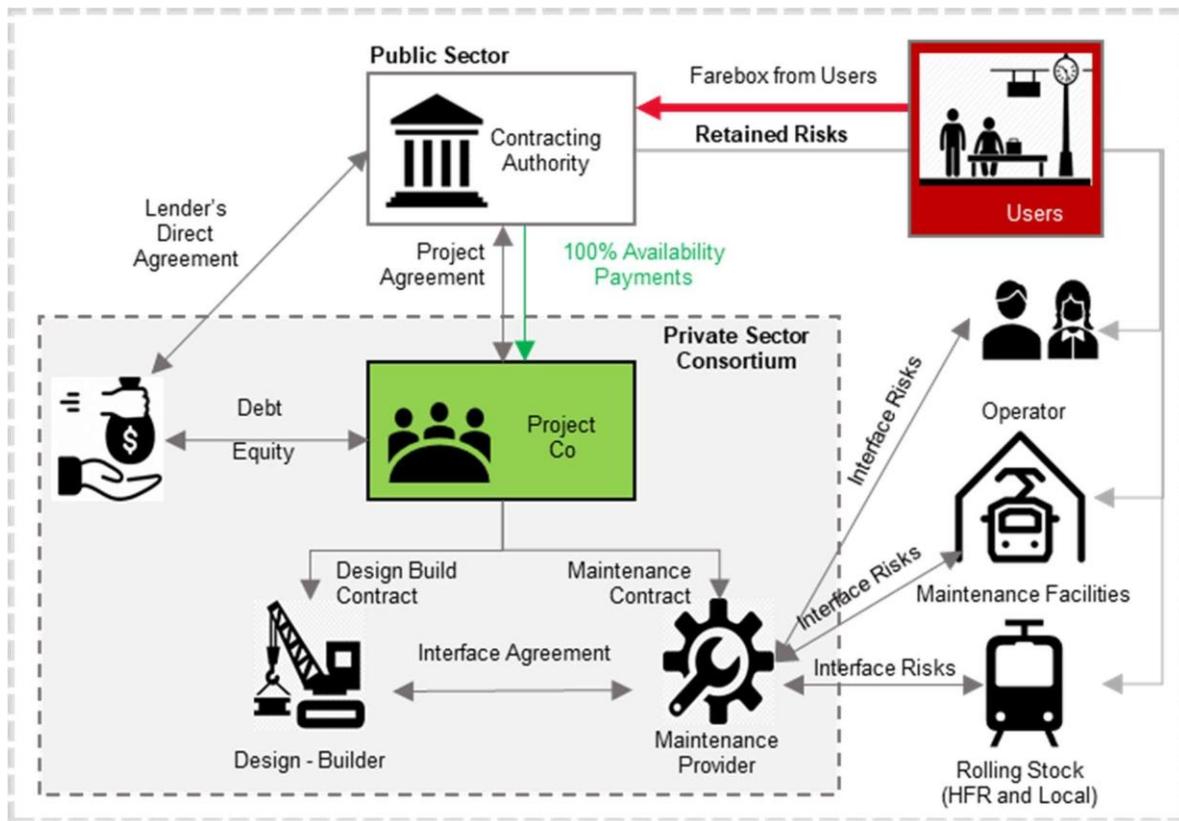


Figure 17 DBFM#1 responsibilities diagram

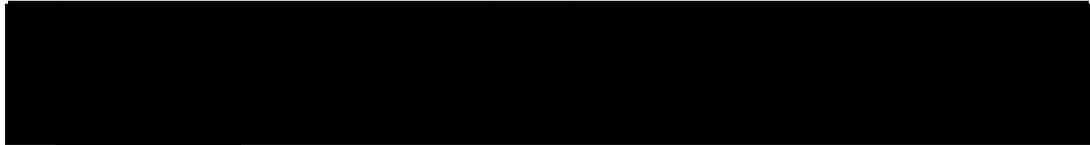
Table 15 DBFM#1 O&M split between the private and public sector

Annual Corridor Operating & Maintenance Costs ²²	
% Transferred to Private Sector	% Retained by Public Sector
8%	92%

²² Based on HFR & Local Services OPEX (maintenance & operating costs) estimates.

The rationale for the scope allocation under the DBFM #1 procurement model is as follows:

- There is a preference from VIA Rail to retain the risk of fleet performance and facilities performance where VIA are currently the Operator.



- Bundling of rolling stock, facilities and operations risks together helps reduce activity changes from current mode of operation.

8.1.2. Risk Transfer

Risk transfer for each procurement model is broken down into three parts, risk transferred to the private sector, risk retained with Contracting Authority, and budget certainty.

- Risk Transfer: Risk transfer is the act of assigning responsibility for various project activities to the Private Partner. Risk transfer is achieved when an entity bears the appropriate financial consequences for poor performance regarding the transferred activities and reaps the rewards of exceeding performance requirements. Depending on the procurement model of the project, the financial consequences used to enable risk transfer can range from deduction regimes for failure to meet performance-based output specifications to reductions in farebox revenue received.
- Risk Retained: Risk retained refers to project responsibilities that either remain with the public sector, or where the public sector bears the financial consequences of poor performance. The degree of risk that is retained by the public sector will depend on the procurement model of the project.
- Budget Certainty: Budget Certainty is the concept of having a firm view of future payment obligations. This is achieved through transferring responsibilities and obligations under long-term fixed price contracts and having private capital take some of the risks ordinarily residing with the public sector. Procurement models that transfer a greater degree of responsibilities to the private sector result in a greater degree of budget certainty for the public sector.

A summary of these points are outlined in Figure 18.

Figure 18: Risk transferred, risk retained, and budget certainty for DBFM #1

Risk Transferred	<i>Minimal maintenance risk transfer with significant interface challenges</i>
Risk Retained	<i>Risk retained will be higher given minimal scope transferred to private sector. Further, interface risks detailed below will be retained risks as well.</i>
Fiscal and Budget Certainty	<i>Public sector only obtains fixed price on less than 10% of total annual O&M costs. This provides limited budget certainty for the government over 30 years.</i>

8.1.3. Interface Complexities

Under the DBFM #1 procurement model, the JPO has identified interfaces between public and private sector responsibility that would require a plan to mitigate risks and conflicts:

- Interface in rail systems between the Signaling & Train Control System (to be designed, built, installed, and maintained by the Private Partner) and the Rolling Stock and Operational Control Centre (OCC) (to be maintained and operated by Public Partner).
- Should Electrification be selected, physical interface exists between the rolling stock pantograph (maintained by the Public Partner) and Overhead wire (designed and maintained by the Private Partner); Possible contention interface point with regards to design interface, reliability and maintainability.
- Rolling stock wheel – rail interface continues to exist under this model; possible contention interface point (lifecycle and maintenance)
- Robust demarcation of maintenance limits required, such as; maintenance facility track boundary to ‘mainline’, and Private Partner designed and maintained assets that are within Public Partner ‘territory’ e.g., signaling, control and communication systems to OCC.

8.1.4. Benefits

The JPO has assessed the benefits for the DBFM#1 procurement model which are detailed below:

- VIA Rail being the Operator manages interfaces risks between rolling stock maintenance and maintenance facilities.
- Operational benefits like customer experience are expected to be achieved, like current performance today. However, this benefit is not unique to this procurement model as Customer Experience and Satisfaction standards will be set for all models where operations is a transferred risk.
- Lower financing premium as the percent of costs and risks transferred to the private sector is the lowest and therefore weighted average cost of capital (WACC) is expected to be slightly lower compared other options.

8.1.5. Challenges

The JPO has assessed the challenges for the DBFM#1 procurement model which are detailed below:

- Significant price risk retained by the public sector with minimal fiscal certainty (~92% of O&M costs will be managed by public sector).
- Limited private sector capital crowded in as the scope of activities transferred is minimal
- New and increased interface risks created between track maintainer and VIA as the rolling stock maintainer and Operator. This may create challenges at the time of revenue service acceptance and when developing and implementing the performance regime (penalties, ability to default or replace the contractor) with public & private sector during the operations phase.
- Asset hand back risk on station and tracks may be impacted as a result of interface risks with operator and rolling stock maintenance (i.e., wheel to track). Further, maintenance and refurbishment of rolling stock (not included in Siemens scope) and rehabilitation of maintenance facilities will continue to be retained risks over 30 years and may result in dilapidations and defect disputes.
- Limited innovation by private sector as output specifications are expected to be more prescriptive; this may be resolved through providing incentives to the private sector to collaborate to ensure higher service levels are achieved.
- Electrification implementation across entirety of HFR and Local services may increase interface complexities and may result in challenges when implementing and imposing performance regimes.
- Based on JPO's existing research study, there has not been DBFM precedent where maintenance obligations of facilities and rolling stock were not transferred to the private sector (examples include mostly LRTs except for HSL Zuid which is an intercity rail service).

8.2. DBFM #2

8.2.1. Description

This option transfers responsibilities of design-build and maintenance (of new and existing track, stations, systems and signaling equipment, and rolling stock), as well as maintenance yard activities to the private sector. This is a more comprehensive risk transfer from the perspective of maintenance work allocation, as all maintenance related work is managed by a single party, which eliminates any potential interface risk and accountability challenges resulted by having separate parties manage track and rolling stock. All operating responsibilities still reside with the public sector.

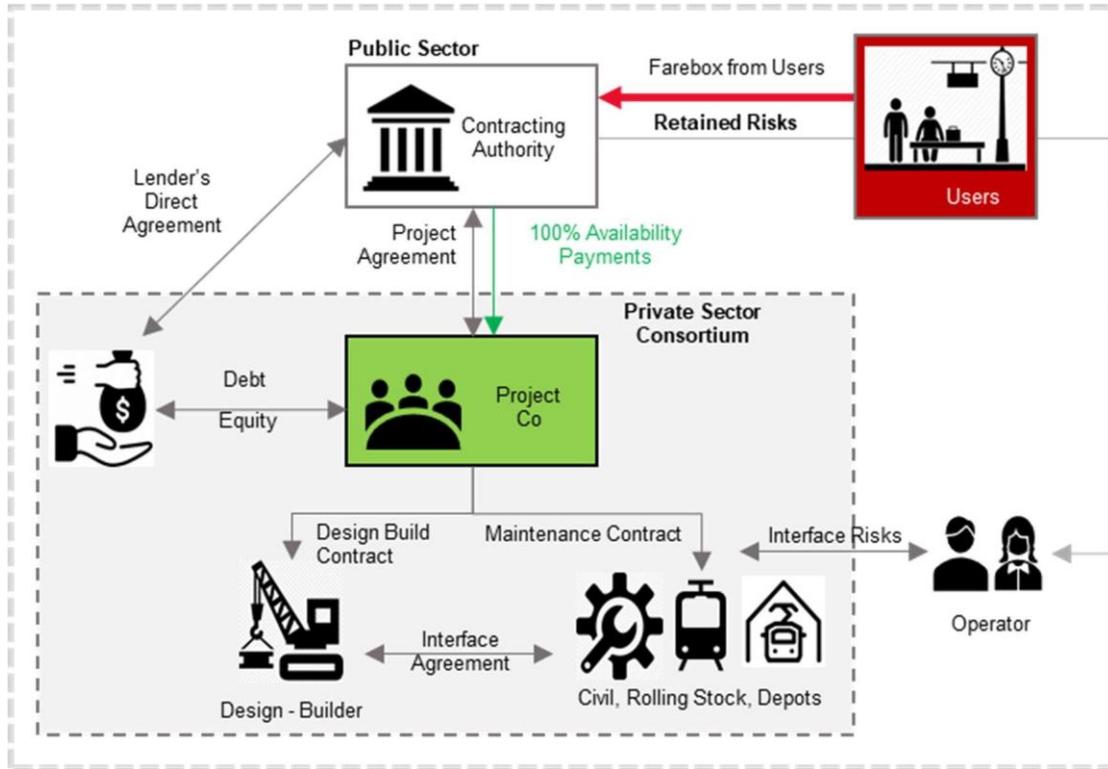


Figure 19 DBFM#2 responsibilities diagram

Table 16 DBFM#2 O&M split between the private and public sector

Annual Corridor Operating & Maintenance Costs ²³	
% Transferred to Private Sector	% Retained by Public Sector
30%	70%

The rationale for the scope allocation under the DBFM #2 procurement model is as follows:

- This avoids interface risks that may arise due to interface between rolling stock and track, or track and infrastructure or systems and signaling.
- As maintenance facilities are mainly used for Corridor train maintenance, they are also responsibilities of the private sector.
- In the DBFM case studies the JPO has reviewed, rolling stock maintenance responsibilities have been passed to the private sector, irrespective of which party procured the trainsets.

²³ Based on HFR & Local Services OPEX (maintenance & operating costs) estimates.

8.2.2. Risk Transfer

A summary of the risk transfer, risk retained, and budget certainty associated with DBFM#2 is presented Figure 20.

Risk Transferred	<i>Main interface between the public Operator and private Maintainer remains, which limits the amount of risk that can be transferred</i>
Risk Retained	<i>All of the operation risk, as well as interface risk detailed below are retained by the public sector. However most of the maintenance risk now resides with private sector</i>
Fiscal and Budget Certainty	<i>Public sector obtains fixed price on about 30% of total annual O&M costs. This is an improvement over DBFM #1 but still subjects the public sector to a substantial amount of price risk over the next 30 years</i>

Figure 20: Risk transferred, risk retained, and budget certainty in DBFM#2

8.2.3. Interface Complexities

Under the DBFM #2 procurement model, the JPO has identified interfaces between public and private sector responsibility that would require a plan to mitigate risks and conflicts:

- Rolling stock wheel – rail interface now resides within one single maintenance party, reducing a significant interface point.
- Robust demarcation of maintenance boundaries / limits required, such as; maintenance facility track boundary to ‘mainline’, and DBFM designed and maintained assets that are within Public Partner ‘territory’ e.g., signaling, control and communication systems to OCC.
- Operations and Maintenance interfaces will need to be managed through project agreement relief events and performance management regimes to avoid disputes and challenges caused by another. (e.g., trains in operation causing damage to tracks).

8.2.4. Benefits

The JPO has assessed the benefits for the DBFM#2 procurement model which are detailed below:

- This option transfers all maintenance related work scope to a single party, thus reducing interface risk amongst the various maintenance service providers (maintenance rolling stock, facilities, stations and tracks are integrated and transferred to private sector). For example, it could mitigate costly disputes that may arise as a result of overlapping responsibility or arising from interface risks.
- Allows for a holistic and long-term approach to asset management for all assets, systems and rolling stock, which reduces the risk to the government of managing long-term asset conditions and helps maintain a state of good repair with fiscal certainty.
- Long term fixed price contract on rolling stock maintenance and rehabilitation provides incentive to the private sector to combine expertise of the rolling stock maintainer with that of the design-builder during bid stage and build-in features that allow long-term maintenance of efficiency to be achieved.

- Unlike DBFM #1, this approach has been tested on various Canadian / international project precedents.

8.2.5. Challenges

The JPO has assessed the challenges for the DBFM#2 procurement model which are detailed below:

- As 70% of the costs will not be transferred to the private sector through long term fixed priced contracts, there will be limited long term budget and fiscal certainty for the government.
- Increased private sector crowding in as scope is a more akin to a traditional Design-Build- Finance and Maintain

VIA has negotiated a TSSSA which can be transferred / made available to the Private Partner. Any gaps

- This approach still does not resolve the interface challenge that exists between the maintainer and the operator.
- Separation of operation scope from maintenance results in the public sector managing service level adjustments to meet demand changes. The separation of service level planning and maintenance plan can lead to less efficient outcomes when considering asset management in the long run. Change mechanisms and incentives need to be clearly set out in the agreement to ensure the Private Partner collaborates effectively with the public sector in managing unexpected adjustments to demand (especially under a long-term concession). Drafting of the compensation and penalty regime will be critical on this front to provide long-term flexibility

8.3. DBFOM #1

8.3.1. Description

This option builds on DBFM #2, with the addition of basic operating responsibilities including train operations (including on train service and products) and station operations. Note that dispatching and network planning are not transferred. Train operations include manpower planning, management and training of locomotive engineers and On Train Staff, purchasing and inventory management of on train products. Station operations include manpower planning, management and training of station staff management, baggage handling, etc.

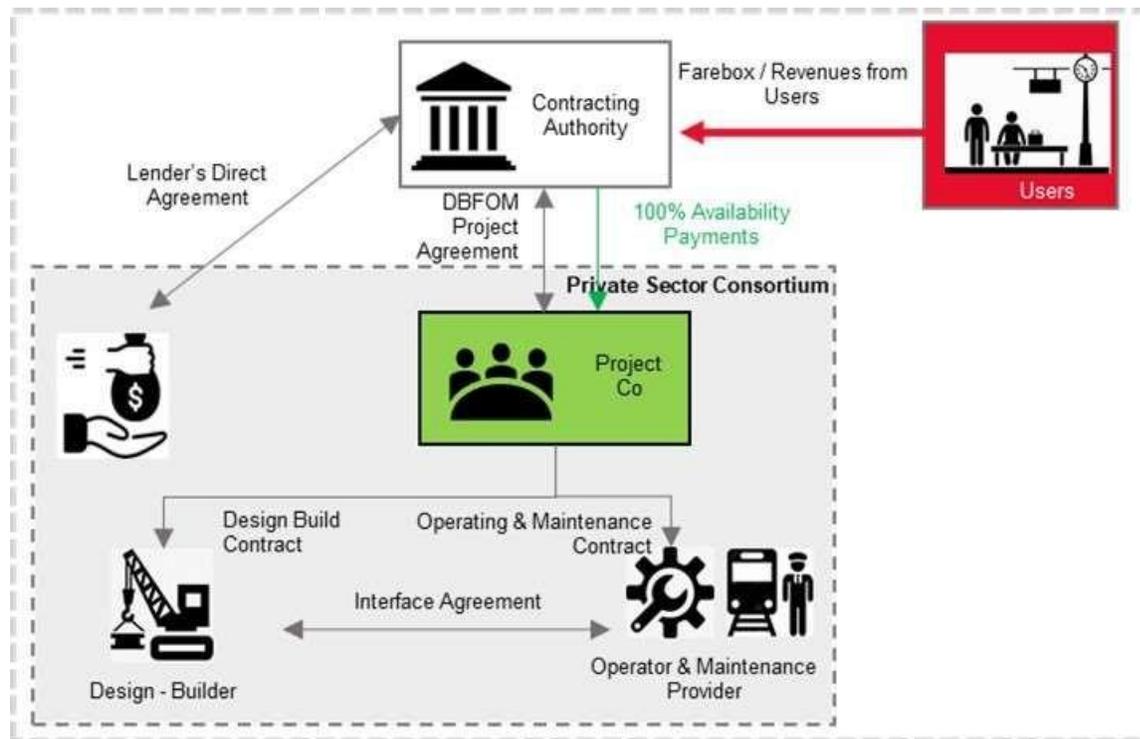


Figure 21 DBFOM#1 responsibilities matrix

Table 17 DBFOM#1 O&M split between the private and public sector

Annual Corridor Operating & Maintenance Costs ²⁴	
% Transferred to Private Sector	% Retained by Public Sector
65%	35%

²⁴ Based on HFR & Local Services OPEX (maintenance & operating costs) estimates.

The rationale for the scope allocation under the DBFOM #1 procurement model is as follows:

- This approach further reduces interface between the maintainer and the operator. It also incentivizes the private sector to design and build the network with future operating efficiencies in mind.
- The Private Partner will optimize labour productivity associated with train and station operations, in order to achieve the availability requirements determined by the public sector (e.g., timetable, OTP)
- This leaves room for more effective and efficient management of staff and operating costs associated with train and stations

8.3.2. Risk Transfer

A summary of the risk transfer, risk retained, and budget certainty associated with DBFOM#1 is presented Figure 22.

Risk Transferred	<i>Essential train operations and all of maintenance activities transferred to the private sector, however existing (non host railway) third-party contracts reside with public sector</i>
Risk Retained	<i>Material reduction of interface risk between Operator and Maintainer however challenges remain on how to manage interface between two operators (public/ private) especially when some services are performed by outside vendors</i>
Fiscal and Budget Certainty	<i>Public sector obtains fixed price on <u>about 65%</u> of total annual O&M costs.</i>

Figure 22: Risk transferred, risk retained, and budget certainty for DBFOM #1

8.3.3. Interface Complexities and Integration Benefits

Under the DBFOM #1 procurement model, the JPO has identified the approach to interfaces between the public and private sector:

- Procurement documents needs to encourage Operations led design and requirements that will help reduce complex interfaces - bringing in operational and maintenance aspects early in the design & build phase
- Interfaces, associated risks that were identified in the DBFM models, are now further incentivized in their reduction and management due to the Operational component and the rigor that operational performance regime brings.

8.3.4. Benefits

The JPO has assessed the benefits for the DBFOM#1 procurement model which are detailed below:

- Approximately 65% of operating and maintenance costs are transferred to the private sector who will provide a long-fixed term price contract. This provides greater fiscal and budget certainty to the government.
- Bundling of operating elements with maintenance is expected to attract increased private sector participation. Example is Hurontario LRT that attracted Ansaldo and Astaldi to the Canadian light rail market (Hurontario is a 18km LRT project).
- Competitive tension between bidders allows for efficiencies on operating costs to be captured upfront. Example – to be financially competitive bidders will need to be conscious of the manpower plans and growth rates for train and station operations for 30 years when submitting bids.
- This option transfers basic operations to the private sector as a result some of the key interfaces between infrastructure maintenance and operations are now integrated under one contractor (e.g., removal of wheel to track interface). This enhances long term asset management and incentivises improved hand back of infrastructure assets.
- Private sector undertakes the responsibility of on-time performance and availability of assets in a holistic manner. Performance regime is expected to be implementable and imposed without major challenges and minimal disputes allowing for public sector to focus on revenue and ridership maximization activities.
- Including long-term operating scope can further incentivize optimized design during construction phase and reduce future operating costs

8.3.5. Challenges

The JPO has assessed the challenges for the DBFOM#1 procurement model which are detailed below:

- Increased private sector capital and greater level of risk transfer can make this option initially appear more expensive than the DBFM options following higher financing premium demanded by the private sector for their increased involvement;
- As the public sector retains managing service level adjustments to meet demand changes, there may be inefficient outcomes when considering asset management in the long run. As a result, change mechanisms and incentives need to be clearly set out in the agreement to ensure the private sector collaborates effectively with the public sector in managing unexpected adjustments to ridership

8.4. DBFOM #2

8.4.1. Description

In addition to basic operating responsibilities, this model also transfers the operating work scope that is currently contracted out to third-party vendors (including timetabling, dispatching, rail traffic control), in addition to certain aspects of the operations that may be transferred or outsourced including customer service center and marketing. A centralized contract further eliminates costly interface and helps achieve more efficient operation than multiple outsourced contracts managed separately by the public sector. The Private Partner will perform key operating tasks, such as scheduling, dispatching, rail traffic control and marketing, based on achieving minimum KPIs required by the public sector (e.g., frequency, OTP, net promoter score). Additional bonus and penalty regime should also be considered in order to align financial incentives between the Private Partner and the public sector who retains revenue risk.

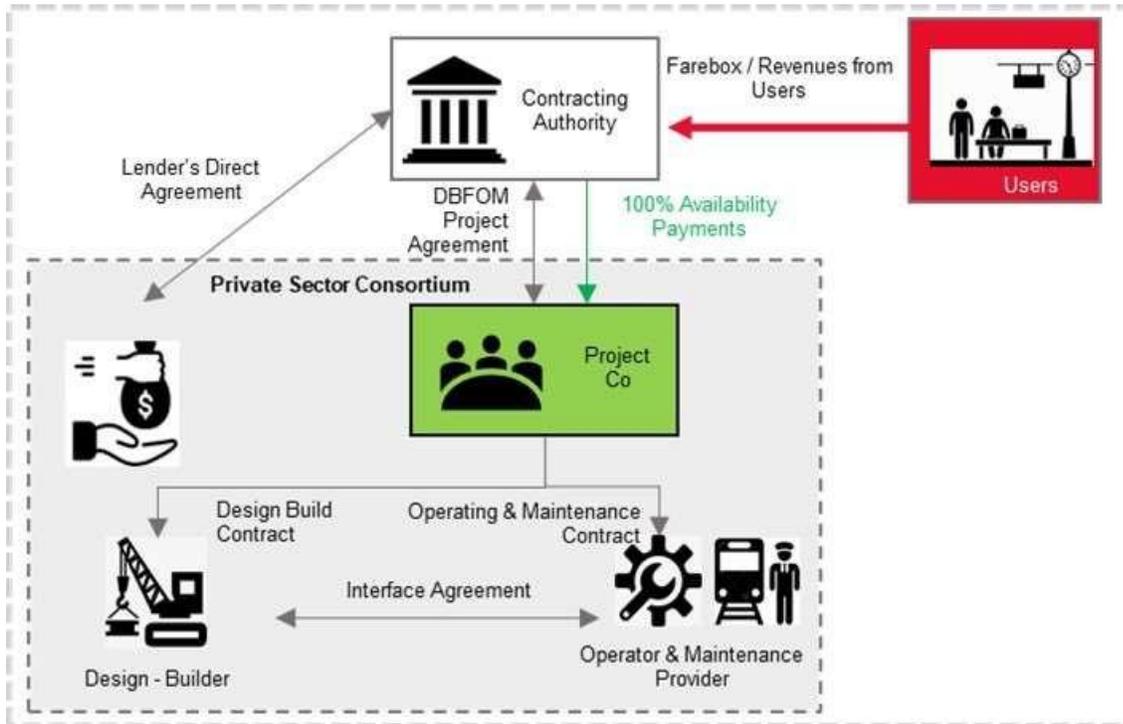


Figure 23 DBFOM#2 responsibilities matrix

Table 18 DBFOM#2 O&M split between the private and public sector

Annual Corridor Operating & Maintenance Costs ²⁵	
% Transferred to Private Sector	% Retained by Public Sector
70%	30%

The rationale for the scope allocation under the DBFOM #2 procurement model is as follows:

- All core operational and maintenance obligations will be transferred under one long term fixed priced integrated contract. This integration allows for expanded opportunities for innovation and efficiencies.
- With a single entity being held responsible most operational and maintenance services allows for greater accountability from the private sector and a reduction in contract management complexity from the perspective of the public sector
- Privately managed marketing and customer service based on pre-determined KPIs can hold the Private Partner accountable for achieving desired service and brand recognition at a fixed price

8.4.2. Risk Transfer

A summary of the risk transfer, risk retained, and budget certainty associated with DBFOM#2 is presented in Figure 24.

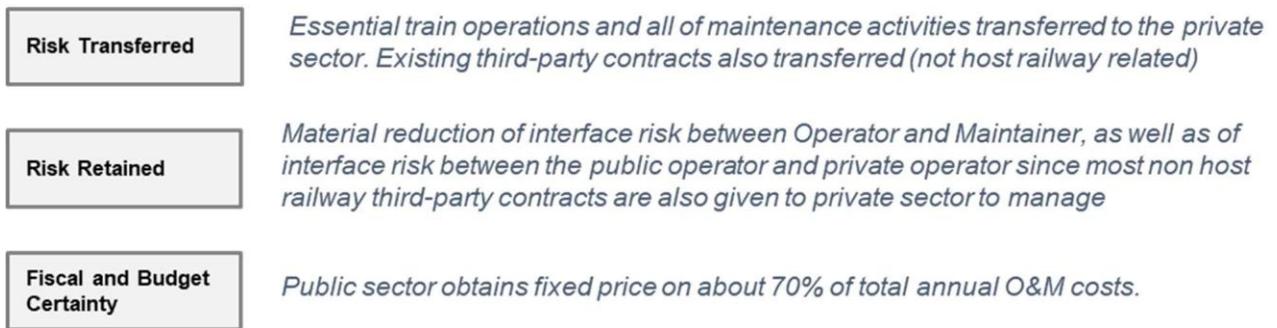


Figure 24: Risk transferred, risk retained, and budget certainty for DBFOM #2

8.4.3. Interface Complexities and Integration Benefits

Under the DBFOM #2 procurement model, the JPO has identified an approach to interfaces between the public and private sector:

- Adding Network planning, dispatching with basic operational functions from DBFOM #1 makes the private sector accountable for interface risks between operator and maintenance provider
- Services provided to Out of Corridor services can be included within the scope of the private sector, if need be
- DBFOM #2 allows the private sector to optimize Design and Build components and provide upfront efficiencies to the government based on balancing operational/ maintenance versus upfront capital decisions. This can help reduce disputes and finger pointing between the various parties within the Corridor

²⁵ Based on HFR & Local Services OPEX (maintenance & operating costs) estimates.

8.4.4. Benefits

The JPO has assessed the benefits for the DBFOM#2 procurement model which are detailed below:

- Fixed priced contract for a larger scope (i.e., 70% of operating and maintenance costs are expected to be transferred to project co) will result in greater budget certainty for the government and owner of the asset for 30 years.
- As this DBFOM option allows for greater transfer of operating scope integrated with rolling stock and systems, it is more likely to attract large international turnkey operators (e.g., MTR, RATP Dev, SNCF etc). International bidders may bring their relationship banks to lend into the project. This can expand liquidity and allow for competitive financing.
- Addition of timetabling, networking planning and dispatching to basic operating activities (train and station operations) provides opportunities for the private sector to optimize design & construction decisions on infrastructure capacity (i.e., decisions on double tracking), systems capacity and rolling stock capacity (i.e., additional rolling stock and changes to service levels is a transferred risk)
- As the private sector to take responsibility for running a live Corridor during the construction phase there is greater private sector innovation and accountability in managing the construction phase (i.e., construction windows vs operations, flagging activities etc.)
- Private sector undertakes the responsibility for customer service and satisfaction, on-time performance and availability of assets in a holistic manner. Performance regime is expected to be implementable and imposed without major challenges and minimal disputes allowing for public sector to focus on revenue and ridership maximization activities.
- In this option, if a "bonus" regime is included, innovation may include whole-life assessment impact from the trade off of current investment to achieve long term benefits e.g., suggestion of new routes and services, introduction of grade separation to increase time to improve ridership. This approach may also allow for sharing of risks related to changes to service level adjustments to meet demand changes.

8.4.5. Challenges

The JPO has assessed the challenges for the DBFOM#2 procurement model which are detailed below:

- Similar to DBFOM #1, this option can lead to slightly higher financing premium being demanded by the private sector for increased involvement; However, CIB can provide support and flexible financing solutions that would help decrease the overall financing costs.
- The public sector needs to set out relevant rules and regulations to ensure customer service needs and social objectives are met and performed by the private sector.

8.5. DBFOM #3

8.5.1. Description

This option builds on DBFOM #2 by transferring revenue collection and management responsibilities to the private sector. As part of the Private Partner’s return comes from profits generated from operations, this option provides the greatest incentive for the private sector to maximize operating efficiency and revenue. The Private Partner will manage and maximize revenue opportunities (subject to overall fare regulation / guidance provided by public sector) including, ancillary revenue opportunities where possible. All revenue model options are expected to have revenue sharing options with the public sector

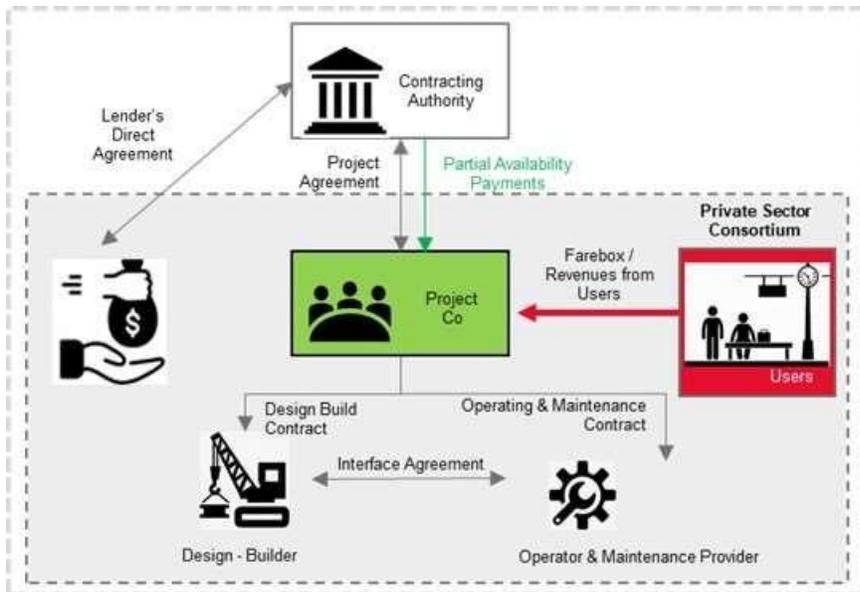


Figure 25 DBFOM#3 responsibilities matrix

Table 19 DBFOM#3 O&M split between the private and public sector

Annual Corridor Operating & Maintenance Costs ²⁶	
% Transferred to Private Sector	% Retained by Public Sector
72%	28%

Due to the significant greenfield revenue risk associated with a “new” passenger rail service offering, as well as existing VIA performance in the Corridor, private investors will likely require some government support to ensure a minimum level of revenue can be achieved in the scenario where ridership forecast does not materialize despite services provided. In addition, there currently exist challenges associated with obtaining required access to major cities and access to track segments that belong to Host Railway, both of which will likely materially impact the realization of HFR revenue potential.

Consequently, at this time a full revenue risk transfer approach is not contemplated as a bankable option to be analyzed. The JPO will instead analyze alternative revenue risk transfer options that include some public sector support through either partial availability payments, minimum revenue guarantee, or a shadow toll payment scheme

Risk Sharing Model	Base case usage and revenue sufficient to generate returns, however there is material downside risk	Partial Availability / Minimum Guarantee Models	DBFOM e.g. Canada Line, A25 & A30 (both A25 and A30 are toll roads)
	Usage risks are manageable, however material risk exists in terms of fare collection	Volume Risk Models	DBFOM e.g. REM
Risk Transfer Model	Manageable demand and usage risk; base level revenue sufficient to generate required rate of return	Full Revenue Risk Models	DBFOM. No Canadian transport project examples available

Figure 26: Revenue model options

8.5.2. Risk Transfer

A summary of the risk transfer, risk retained, and budget certainty associated with DBFOM #3 is presented in Figure 27.

²⁶ Based on HFR & Local Services OPEX (maintenance & operating costs) estimates.

Risk Transferred	<i>Essential train operations and all of maintenance activities transferred to the private sector. Existing (non host railway) third-party contracts also transferred in addition to revenue management responsibilities</i>
Risk Retained	<i>Material reduction of interface risk between Operator and Maintainer, as well as of interface risk between the public operator and private operator especially as key decision-making activities in operations now reside with private sector. Nonetheless, the public sector will likely continue to be held accountable for railway operations</i>
Fiscal and Budget Certainty	<i>Public sector obtains fixed price on about 72% of total annual O&M costs.</i>

Figure 27: Risk transfer, risk retained, and budget certainty for DBFOM #3

8.5.3. Interface Complexities and Integration benefits

Under the DBFOM #3 procurement model, the JPO has identified an approach to interfaces between the public and private sector:

- Transferring revenue management risk to Private Sector allows the private sector to be nimble to the changes in demand and service levels
- This reduces the interface issues between on going capex, maintenance, rolling stock decision and maximization revenue opportunities

8.5.4. Benefits

The JPO has assessed the benefits for the DBFOM#3 procurement model which are detailed below:

- Private Sector Equity is exposed to revenue risk and will be incentivized to promote revenue growth.
- This option maximizes the potential for efficiency as it encompasses all aspects of the Project including, revenue-related responsibilities. With revenue responsibility, the operator can optimize both the cost and revenue delivering the bid line by managing costs and driving revenue against a "fixed" bid line.
- Fixed priced contract for a slightly larger scope (i.e., 72% of operating and maintenance costs are expected to be transferred to Private Sector) will result in greater budget and cost certainty for the government as the ultimate owner of the asset for 30 years.
- Integrated procurement options are expected to attract large international private sector operators (e.g., MTR, Keolis). Procurement options with partial revenue risk are also expected to attract large private equity firm, institutional and pension funds (e.g., CDPQ, OMERS, OTPP)
- The Private Sector continues to be responsible for whole-life asset management and planning, adherence to performance requirements and compliance to all standards and policies requirements (i.e., fare policy, service quality, customer satisfaction, safety, infrastructure hand-back requirements etc.).
- Integration of revenue risk allows for due diligence by private sector on governments ridership forecasts. This allows Private Sector to take the risk on long term service level planning, long term rolling stock/capacity decisions and balancing upfront vs long term capital planning decisions

8.5.5. Challenges

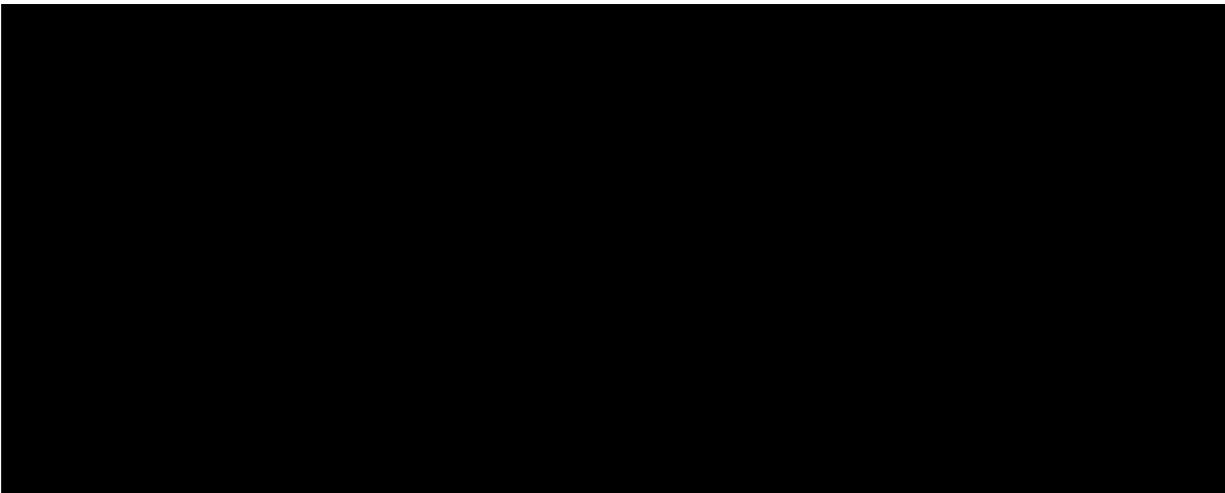
The JPO has assessed the challenges for the DBFOM#3 procurement model which are detailed below:

- Potentially higher financing costs due to revenue risk being transferred; however, CIB can provide support and flexible financing that would help decrease the overall financing costs.
- The public sector needs to carefully set out relevant rules and regulations to ensure minimum service levels are provided and pricing can satisfy important social objectives.
- COVID may result in some bidders shying away from taking revenue risk transfer; however, CIB can provide support by providing equity that can take asymmetrical losses.

8.6. Prior Precedents

8.6.1. DBFM #1 and DBFM #2

Table 20 DBFM#1 & DBFM#2 prior precedents table



The precedents above closely resemble the scope split under DBFM #2 where maintenance of infrastructure, rolling stock (and in consequence activities associated with maintenance facilities) was transferred to the private sector. This helps reduce interfaces that may arise between the two maintainers, especially on key scope items such as the signaling system. This consideration is of importance in an electrification scenario where complex systems often involve both rolling stock and ground systems (e.g., overhead catenary, train control systems).

Other than HSL Zuid (125km intercity rail), Ottawa and Eglinton are LRT projects (12.5km and 19km respectively)

8.6.2. DBFOM #1 and #2

Table 21 DBFOM#1 & DBFOM#2 prior precedents table



These case studies provide examples of rail projects where operations scope is transferred to the private sector while the public sector retains revenue risk.

Network planning was transferred on Waterloo & Hurontario LRT but not on Denver Eagle FasTrack and Canada Line. This was due to complex interface involved with other transit lines which made a strong case for the public authority to manage the full public transit network. For HFR Project this would not be the case if the entire Corridor service is transferred as a whole.

In the above precedents, marketing and ancillary services were not transferred. In these scenarios, the procured project was a part of the overall transit authority expansion plan and was therefore managed under the existing transit authority. Since VIA is an already established dedicated intercity passenger rail brand, the same consideration has limited implications.

Denver Eagle FasTracks includes 58km of commuter rail service; Waterloo LRT and Hurontario LRT include respectively 19km and 18km of light rail service; and Canada Line includes 19km of rapid transit service

8.6.3. DBFOM #3

Table 22 DBFOM#3 prior precedents table



If revenue risk is transferred fully or partially to the private sector, the general tendency is for the public sector to transfer as much operating responsibilities to the private sector as possible. However, unless the private sector retains full revenue risk, fare policy is typically a retained responsibility of the public sector, and farebox risk is generally shared between the public and private sector

Brightline is a privately owned passenger rail service between Miami and Orlando including 378 km of double-tracked line (i.e., total of 756km of track), of which 314km is existing single-tracked freight track. Track maintenance is contracted out by the operator Virgin Train USA to the freight company FECR through a Joint Use Agreement

Gautrain Rapid Rail includes a 77 km high-speed rail link connecting Johannesburg's business district to Johannesburg airport; Zaragoza Tramway includes a 12.8km urban rail transit system in Zaragoza, Spain; REM includes 67km of light rail system in Montréal, Canada

8.6.4. Summary of Options

This section provides a summary of the shortlisted procurement options that were assessed by the JPO. Table 23 is a summary table outlining the allocation of operational and maintenance activities across the public and private sector. Figure 28 provides a summary comparison of the level of risk transfer to the private sector under the procurement models. Figure 29 summarizes the level of public sector fiscal certainty under the different procurement models.

Table 23 Procurement model scope split based on VIA General Ledger accounts

Activities	Description	DBFM 1	DBFM 2	DBFOM 1	DBFOM 2	DBFOM 3
Maintenance Costs						
Train Maintenance – Staff	Maintenance	Public	Private	Private	Private	Private
Train Maintenance – Non-Staff	Maintenance	Public	Private	Private	Private	Private
Track Maintenance	Maintenance	Private	Private	Private	Private	Private
Signalling Maintenance	Maintenance	Private	Private	Private	Private	Private
OLE Maintenance	Maintenance	Private	Private	Private	Private	Private
Station Costs Maintenance	Maintenance	Private	Private	Private	Private	Private
Railyards Maintenance (TMC & MMC)	Maintenance	Public	Private	Private	Private	Private
Fuel – Diesel (Volume and Pricing)	Operations	Public	Shared	Shared	Shared	Shared
Fuel – Electricity (Volume and Pricing)	Operations	Public	Shared	Shared	Shared	Shared
Operating Costs						
On Train Staff	Operations	Public	Public	Private	Private	Private
Locomotive Engineers	Operations	Public	Public	Private	Private	Private
On Board Product Costs	Operations	Public	Public	Private	Private	Private
Sales Commissions	Operations	Public	Public	Public	Public	Private
VIA Customer Center & Service Staff	Operations	Public	Public	Public	Private	Private
Marketing & Branding	Operations	Public	Public	Public	Private	Private
Signalling Operations	Operations	Public	Public	Public	Private	Private
CP LOI Charges	Operations	Public	Public	Public	Public	Public
Station Staff	Operations	Public	Public	Public	Private	Private
Station Costs Opex	Operations	Public	Public	Public	Private	Private
Reservation & Ticketing (IT Systems)	Operations	Public	Public	Public	Private	Private
Revenue Management & Collection	Operations	Public	Public	Public	Public	Private
Head Office / Admin – Staff	Operations	Public	Public	Public	Public	Public
Head Office / Admin – Non-Staff	Operations	Public	Public	Public	Public	Public
TSA Costs	Operations	Public	Public	Public	Public	Public
Corporate Strategy	Operations	Public	Public	Public	Public	Public
Fare Policy	Operations	Public	Public	Public	Public	Public
Safety, Regulation, Performance Standards	Operations	Public	Public	Public	Public	Public
Project Co Percentage of Costs		8%	30%	65%	70%	72%
Public Sector Percentage of Costs		92%	70%	35%	30%	28%



Figure 28 Procurement model risk transfer



Figure 29 Procurement model fiscal and budget certainty

9. Financial Case

9.1. Capital Expenditure (CapEx)

A Class 5 capital cost estimate was developed for the selected alignment and is based on design team inputs, assumptions, and exclusions as outlined in the *Cost Report*. A Class 5 estimate is the first of a series of five class estimation categories. Estimate classifications progress, provided that base project definition, requirements, and scope are set, in narrowing accuracy ranges as a project transitions through stages of maturity, development, and definition. The methodology and approach used to develop the Class 5 estimate is based on AACEi guidelines and industry best practices.

The purpose of the Class 5 estimate, by definition, is to provide a high-level estimate for strategic business planning. Therefore, the cost estimates in this report are not meant and should not be used to represent the budget for the works but rather to provide a rough order-of-magnitude estimate based on industry best practices and the conceptual analysis and studies undertaken to date.

The following Figure 30 and

Table 24 summarize the lower and upper boundary Infrastructure Capex costs with an accuracy range of -25 percent and +40 percent per AACEi (Association for the Advancement of Cost Engineering international) standards. Throughout this section, the calculated costs are referred to as the 'likely' costs purely for the purposes of comparison; it is important to consider these costs as a range at this stage. Multiple factors will affect the final out-turn costs, which will differ from the calculated costs. The following graphic representation and subsequent CapEx table summarize the estimated capital costs per segment for infrastructure, 3rd party costs, right of way, and electrification.

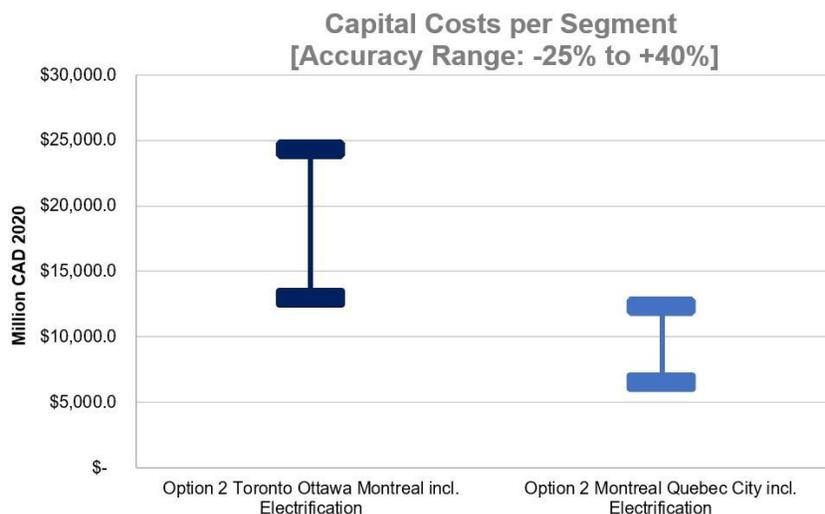


Figure 30 Total Capex Accuracy Range including electrification

Table 24 Infrastructure, ROW, 3rd party and electrification costs for the selected alignment (million CAD 2020)

	TOR-OTT-MTL	MTL-QUE	Total TOR-MQ
Total Infrastructure ²⁷ (High)	\$ 13,936	\$ 5,279	\$ 19,215
Total Infrastructure (Likely)	\$ 9,954	\$ 3,771	\$ 13,725
Total Infrastructure (Low)	\$ 7,466	\$ 2,828	\$ 10,294
ROW (High)	\$ 610	\$ 482	\$ 1,092
ROW (Likely)	\$ 436	\$ 344	\$ 780
ROW (Low)	\$ 327	\$ 258	\$ 585
Electrification (High)	\$ 3,706	\$ 1,301	\$ 5,006
Electrification (Likely)	\$ 2,647	\$ 929	\$ 3,576
Electrification (Low)	\$ 1,985	\$ 697	\$ 2,682

Table 25: Summary of CN Capacity Improvement costs

Study	West Montréal Access	East Montréal/ Québec City Access	Total
2020 November Capacity Study Update			
2021 June Capacity Study Update			

²⁷ The capital costs associated with upgrades to deliver the Dorval Hub intermodal station have been excluded from the estimates for HFR infrastructure. Capital cost estimates and further details are included in the *Dorval Hub Link Interconnectivity Study* report.



Table 26 outlines the estimated rolling stock acquisition costs based on the reference concept vehicle, for both the HFR fleet requirements and the Business-As-Usual (BAU) fleet.

Table 26 Total estimated Rolling Stock acquisition costs (values in million CAD 2020)

	Rolling Stock Costs
HFR Diesel Rolling Stock Acquisition Costs (22 trainsets, – 6 cars)	\$ 869.2
HFR Additional Rolling Stock costs for Electrification conversion (EPC Car)	\$ 150.2
Total HFR Electrified Rolling Stock Acquisition Costs (7 car trainsets)	\$ 1,019.3
HFR Additional Rolling Stock allowance for TMC cycling (2 trainsets - Extra Long - electrified)	\$ 92.7
Total Additional Rolling Stock – TMC Allowance	\$ 92.7
Local Diesel Additional Rolling Stock Acquisition Costs (convert to 6-car trainsets)	\$ 153.5
Local Additional Rolling Stock costs for Electrification (EPC Car)	\$ 218.4
Total Local Electrified Additional Rolling Stock Acquisition Costs (conversion to 7-car electrified trainsets)	\$ 371.9

9.2. Journey Times and Indicative Timetables

9.2.1. HFR Schedule

The HFR project will provide improved service and more choice leading to increased ridership from 4.8 million trips in 2019 increasing to 11.0 million trips post ramp-up (2034) and 16.8 million trips per year at the end of the initial 30 years of operations (2059).

HFR will enable faster journey times between Toronto, Ottawa, Montréal, and Québec City with an alignment that provides journey times better than current services. With the planned services on HFR passengers will be able to travel between:

- Toronto and Ottawa in less than three hours;
- Toronto and Montréal in approximately four hours;
- Ottawa and Montréal in an hour and forty minutes; and
- Montréal and Québec City in less than three hours

Table 27 Existing VIA and future HFR travel times between major routes

Segment	Jan 2020 VIA Average Journey Times	HFR – Average Journey Times	Jan 2020 VIA Fastest Journey Time	HFR – Fastest Journey Time
Toronto - Montréal	5:03	4:10	4:49	3:59
Toronto – Ottawa	4:27	2:54	4:05	2:50
Ottawa – Montréal	2:02	1:43	1:50	1:40
Montréal – Québec City	3:24	2:51	3:11	2:45

The JPO developed indicative opening day timetables based on the HFR alignment and reference vehicle. These timetables were used as a key input into the development of the ridership and revenue forecasts. The indicative opening day timetables were developed with a strategic focus to improve the passenger experience. Key benefits of the HFR timetable include:

- Higher frequency and faster journey times combine to provide the traveler market with an attractive schedule.
- Schedule allows for daily round trips between key city pairs, ideal for commuter & business markets.
 - One train a day from Toronto to Montréal arriving before 9am.
- As demand for the service increase, additional departures will fill out holes in schedule to create a true hourly service.

Indicative timetables are provided on the next page.

Indicative timetables for Toronto-Ottawa opening day service

Station	TO1	TO2	TO3	TO4	TO5	TO6	TO7	TO8	TO9	TO10	TO11	TO12
Union	5:15	6:00	6:30	8:00	10:00	11:00	13:15	15:00	16:00	16:45	18:00	19:15
Toronto City Station	5:26	6:11	6:41	8:11	10:11	11:11	13:26	15:11	16:11	16:56	18:11	19:26
Peterborough	6:18				11:03		14:18		17:03			20:18
Smiths Falls	7:40				12:25		15:40		18:25			21:40
Fallowfield	8:03	8:40	9:10	10:40	12:48	13:40	16:03	17:40	18:48	19:25	20:40	22:03
Ottawa	8:13	8:50	9:20	10:50	12:58	13:50	16:13	17:50	18:58	19:35	20:50	22:13
Journey Time	2:58	2:50	2:50	2:50	2:58	2:50	2:58	2:50	2:58	2:50	2:50	2:58

Peak AM Departures

Early AM arrival and late afternoon departures provide robust business traveller schedule: daily round trip

Peak PM Departures

Flexible end-of-day train

Station	OT1	OT2	OT3	OT4	OT5	OT6	OT7	OT8	OT9	OT10	OT11	OT12
Ottawa	5:15	5:45	6:30	8:00	9:00	11:00	13:00	15:00	16:00	16:45	17:30	19:00
Fallowfield	5:28	5:58	6:43	8:13	9:13	11:13	13:13	15:13	16:13	16:58	17:43	19:13
Smiths Falls	5:51			8:36			13:36		16:36			19:36
Peterborough	7:14			9:59			14:59		17:59			20:59
Toronto City Station	8:05	8:26	9:11	10:50	11:41	13:41	15:50	17:41	18:50	19:26	20:11	21:50
Union	8:14	8:35	9:20	10:59	11:50	13:50	15:59	17:50	18:59	19:35	20:20	21:59
Journey Time	2:59	2:50	2:50	2:59	2:50	2:50	2:59	2:50	2:59	2:50	2:50	2:59

Clock facing & near hourly service throughout the day

Indicative timetables for Toronto-Montréal opening day service

Station	TM1	TM2	TM3	TM4	TM5	TM6	TM7	TM8	TM9	TM10	TM11	TM12
Union	5:00	6:00	7:00	9:00	10:00	11:00	13:15	14:00	16:00	17:00	18:00	19:15
Toronto City Station	5:11	6:11	7:11	9:11	10:11	11:11	13:26	14:11	16:11	17:11	18:11	19:26
Peterborough		7:03			11:03		14:18		17:03			20:18
Smiths Falls		8:25			12:25		15:40		18:25			21:40
Dorval		10:00	10:45	12:53	13:52	14:53	17:07	17:53	19:52	20:53		23:15
Montreal	8:59	10:19	11:04	13:12	14:11	15:12	17:26	18:12	20:11	21:12	21:59	23:34
Journey Time	3:59	4:19	4:04	4:12	4:11	4:12	4:11	4:12	4:11	4:12	3:59	4:19

Early Arrival but not well before 9:00am

Clock facing & near hourly service throughout the day

Early AM arrival and late afternoon departures provide robust business traveller schedule but not daily round trip

Flexible end-of-day train

Station	MT1	MT2	MT3	MT4	MT5	MT6	MT7	MT8	MT9	MT10	MT11	MT12
Montreal	5:20	6:20	7:20	9:20	10:20	11:20	13:20	14:20	16:20	17:20	18:20	19:55
Dorval	5:41	6:41	7:41	9:41	10:41	11:41	13:41	14:41	16:41	17:41	18:59	20:16
Smiths Falls		8:16			12:16		15:16		19:08			
Peterborough		9:38			13:38		16:38		20:30			
Toronto City Station		10:30	11:22	13:14	14:30	15:14	17:30	18:14	20:22	21:22		23:49
Union	9:20	10:39	11:31	13:23	14:39	15:23	17:39	18:23	20:31	21:31	22:28	23:58
Journey Time	4:00	4:19	4:11	4:03	4:19	4:03	4:19	4:03	4:11	4:11	4:08	4:03

9.3. Frequencies

Frequencies are determined by balancing schedule attractiveness, demand, and supply. For every market, the appropriate amount of frequencies (above the baseline timetable) are calculated by dividing the daily passengers travelling on a given route by *the average number of seats per trip* multiplied by a maximum allowable load factor.

This methodology ensures enough capacity is supplied to the market to capture all available demand but is also heavily dependent on the average number of seats per trip, which is synonymous with consist size and highly dependent on the reference concept fleet chosen. This methodology also assumes that all intercity passengers are seated in accordance with current intercity operations today.

In the case of this section, the reference concept vehicle is the Siemens fleet with a fixed seating density/configuration. Changes to the reference concept vehicle such as an increase in seating density, i.e. the ability to transport more passengers per trip (larger denominator), would result in the market requiring less frequencies overall to satisfy the same demand (same numerator); this is a form of optimization around the reference concept vehicle. This change to the reference concept vehicle (producing the same seats in the market but with less frequencies) has downstream optimization impacts such as the ability to meet city access capacity constraints and less overall operational expenditures, all while capturing the same amount of passengers and revenues. Optimizations such as varying average fares and journey times, and their impact on demand and consequently the required frequencies are also being reviewed and are summarized in the Optimization addendum.

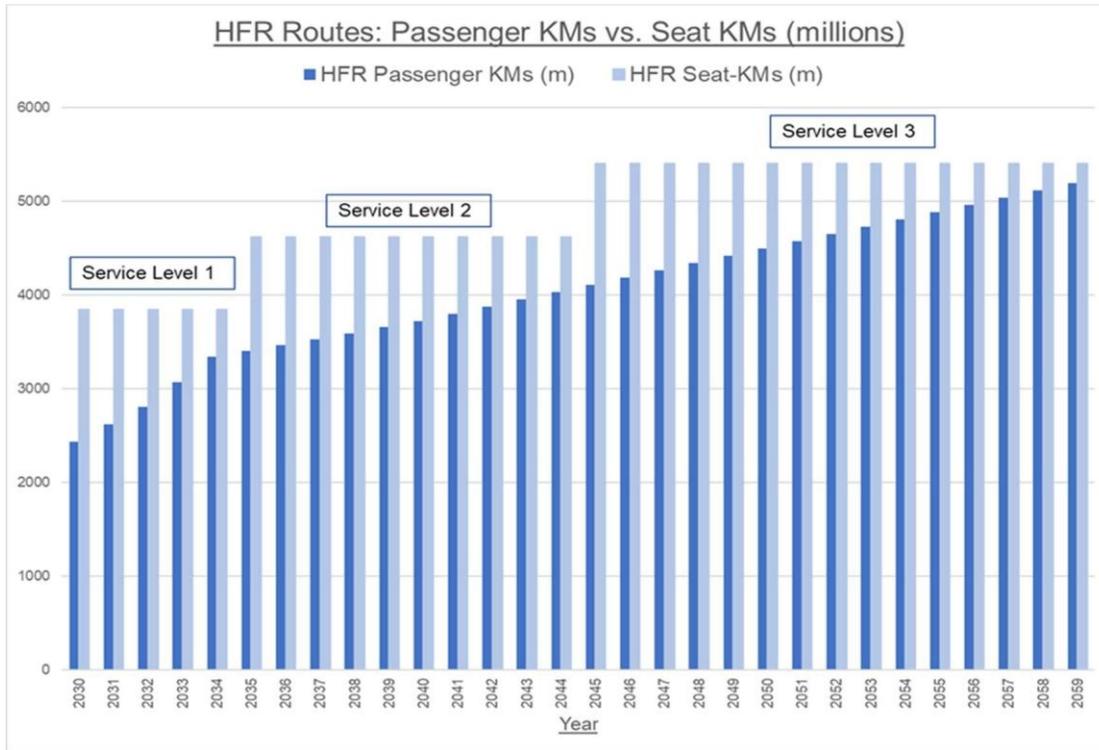


Figure 31: Growth of HFR passenger demand and seat capacity over a 30-year period

The JPO identified three different service levels over a 30-year period (consisting of higher frequencies and/or train sizes) to accommodate the estimated increase in demand. Train sizes and seats are based on the reference concept vehicle.

Table 28: Indicative HFR Service Levels

HFR Service Levels	Service Level 1	Service Level 2	Service Level 3
Time Frame	2030-2034	2035-2044	2045-2059
Daily Round Trip Frequencies			
Montréal – Toronto	12	15	18
Toronto – Ottawa	12	15	18
Ottawa – Montréal	12	12	12
Montréal – Québec City	10	10	10
Train Size (Number of Cars and Seats per Train)			
Montréal – Toronto	7 / 409	7 / 409	7 / 409
Toronto – Ottawa	7 / 409	7 / 409	7 / 409
Ottawa – Montréal	4 / 235	4 / 235	4 / 235
Montréal – Québec City	4 / 235	4 / 235	4 / 235

Increasing the supply in order to accommodate as many passengers as forecasted will increase the size of the operations which will go on to drive operational costs, capital costs, lifecycle costs, and maintenance costs.

9.4. Ridership & Revenue

9.4.1. Introduction

This section sets out the status of the Ridership and Revenue forecasts for the HFR project in the Québec City-Windsor corridor based on the forecasting framework dated July 8, 2021²⁸. The JPO is developing an investment grade ridership report at the time of this Business Case Update – dated December 10, 2021.

The forecasting framework for HFR builds upon an approach widely accepted throughout the transportation industry and commonly used to estimate potential demand for rail networks in the context of a brownfield infrastructure project.

As far as reasonably practical, the modelling framework developed produces forecasts for a range of inputs, situations and options that are internally consistent and coherent within the transport modelling and forecasting paradigm.

Forecast results for the HFR Electric or Bi-Mode option, where the majority of the traction is electric, are presented as part of this report. Unless specified otherwise, revenues include farebox and on-board ancillary sales. They are in real 2019 Canadian dollars, NET of taxes.

All ridership and revenue outputs in this section should be seen as sitting within a range of +/- 15%. In addition, ridership and revenue forecasts presented here are unconstrained, and assume that sufficient capacity and high on-time performance can be achieved through infrastructure or commercial solutions. Further work is required by the JPO to optimize the balance between supply, demand and costs.

²⁸ Version 58 of Steer forecasting framework developed in July 2021 following a station change on the alignment in Greater Toronto with minor journey time impacts.

9.4.2. Forecasts Results

Headline forecasts

Forecasting results indicate that the HFR Electric Option has 73% more riders and generates 86% more revenue than the Business as Usual (BAU) scenario (i.e., existing riders if there is no HFR) during the first 30 years of operation of HFR.

Table 29: Cumulative ridership and revenue forecasts for the 2030-2059 evaluation period, in millions (rounded)

2030-59 cumulative	BAU	HFR Electric
Total riders (millions)	235	405 (+73%)
Total revenue (\$2019, in millions)	18,068	33,661 (+86%)

Source: Steer analysis²⁹

Increases in HFR ridership and revenue have three fundamental sources: abstraction from other modes (car, air and inter-city bus), natural growth of the existing rail market and induced traffic.

Ridership composition, modal shift and induced demand

Around 37% of the future rail demand in the Quebec-Windsor corridor is abstracted from other modes while 5% is induced. Modal shift comes mainly from air and auto market (Table 30 and Figure 32). The ridership composition of the Electric option is the following: 20% of the rail demand come from air travellers, 16% from car travellers, 1% from intercity bus users and 5% from induced demand (i.e., new trips that would otherwise not have occurred) as a result of HFR.

Table 30: Demand composition by mode for the 2030-2059 evaluation period, in millions (rounded)

2030-59 cumulative	BAU	HFR Electric
Existing rail	235	235
Capture from Car	-	65
Capture from Air	-	81
Capture from Bus	-	3
From induced	-	21
Total riders (millions)	235	405

Source: Steer analysis³⁰

²⁹ Analysis includes all discrete passenger trips, an initial period to scale the new demand after the HFR opening (ramp-up), and assumptions to account for improved revenue management and potential under HFR (yield management uplift).

³⁰ Same as footnote 29.

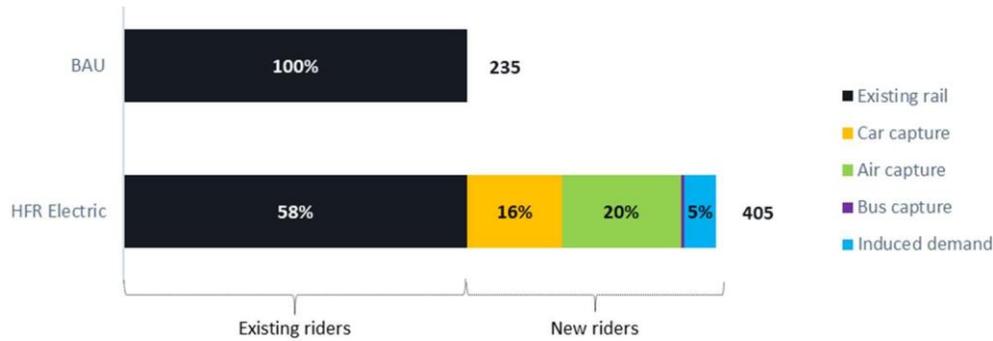


Figure 32: Demand composition (%) by mode for the 2030-2059 evaluation period

Source: Steer analysis³¹

Forecast results by rail segments

Table 31 below presents the cumulative ridership and revenue forecasts over 30-years across the full Québec City-Windsor corridor split by network rail segment. Upon opening, HFR attracts new demand (from capture and induced) and existing riders adopt the new services (migrating from the existing rail routes to the HFR routes) where appropriate to complete their journey. Around 70% of the riders (~78% of the revenue) will use the HFR rail segments. HFR T-O carries 28% of the riders and is responsible for 31% of the revenues. HFR T-M carries a similar level of riders and slightly larger share of the revenues (35%) due to higher average yields (see Figure 33).

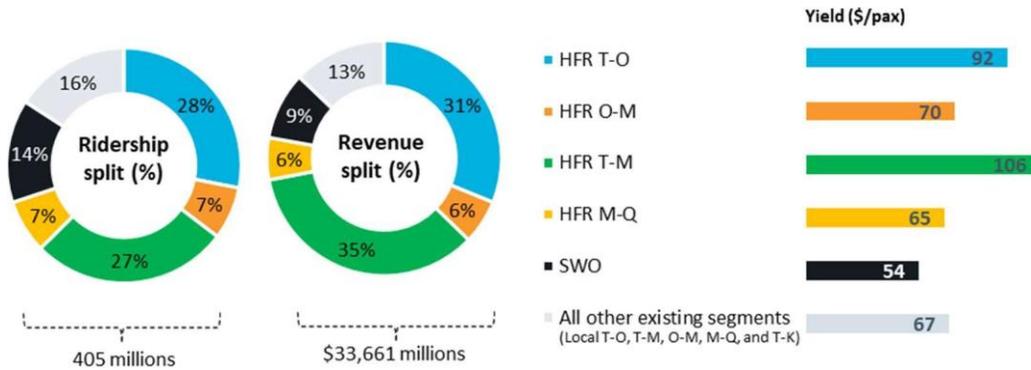


Figure 33: Ridership and revenue split (%) by rail segment³² for the 2030-2059 evaluation period – HFR Electric option

Source: Steer analysis³³

³¹ Same as footnote 29.

³² Demand and revenue for intermediary stations included where appropriate depending on the rail line.

³³ Same as footnote 29.

Table 31: Cumulative ridership and revenue by rail segment for the 2030-2059 evaluation period, in millions (rounded)

Rail segment	Ridership (in millions)		Revenue (\$2019, in millions)	
	BAU	Electric	BAU	Electric
HFR T-O	-	114	-	10,482
HFR O-M	-	29	-	2,053
HFR T-M	-	110	-	11,709
HFR M-Q	-	30	-	1,944
HFR sub-total	0	283	0	26,188
SWO	56	58	2,958	3,134
T-K	3	22	153	1,468
T-O	66	13	5,743	884
T-M	58	14	5,760	1,056
O-M	29	8	1,982	510
M-Q	23	8	1,471	421
Total	235	405	18,068	33,661

Note: Figures may not sum due to rounding.

High and low forecast results

A series of sensitivity tests that change one input in isolation at a time against the HFR Electric option have been undertaken to both demonstrate the level of responsiveness of the forecasts for HFR and indicate the likely envelope of uncertainty around the central case forecasts and a range of modelling factors. The sensitivity analysis informed the development of a high and low case for demand and revenue associated with the project. Results are shown in Table 32.

Table 32: Cumulative high and low ridership and revenue forecasts for the 2030-2059, in millions, HFR Electric case (rounded)

2030-59 cumulative	Base Case	High Case	Low Case
Total riders (millions)	405	474 (+17%)	299 (-26%)
Total revenue (\$2019, in millions)	33,661	39,208 (+16%)	23,962 (-29%)

Source: Steer analysis³⁴

³⁴ Same as footnote 29.

9.5. Operations & Maintenance Costs (OpEx)

An operation and maintenance (OPEX) cost model was developed to produce cost profiles to populate the financial models being developed by the JPO’s Finance and Commercial teams. These vary based on three demand scenarios and three procurement options. The model was built for a specific alignment and, as a result, inputs such as track lengths, demand, and service levels are specific to the modelled alignment.

Figure 34 presents the total OPEX costs per annum. The total OPEX cost in 2030 is CAN\$834.5 million with a range of CAN\$805.2 million to CAN\$879.4 million.

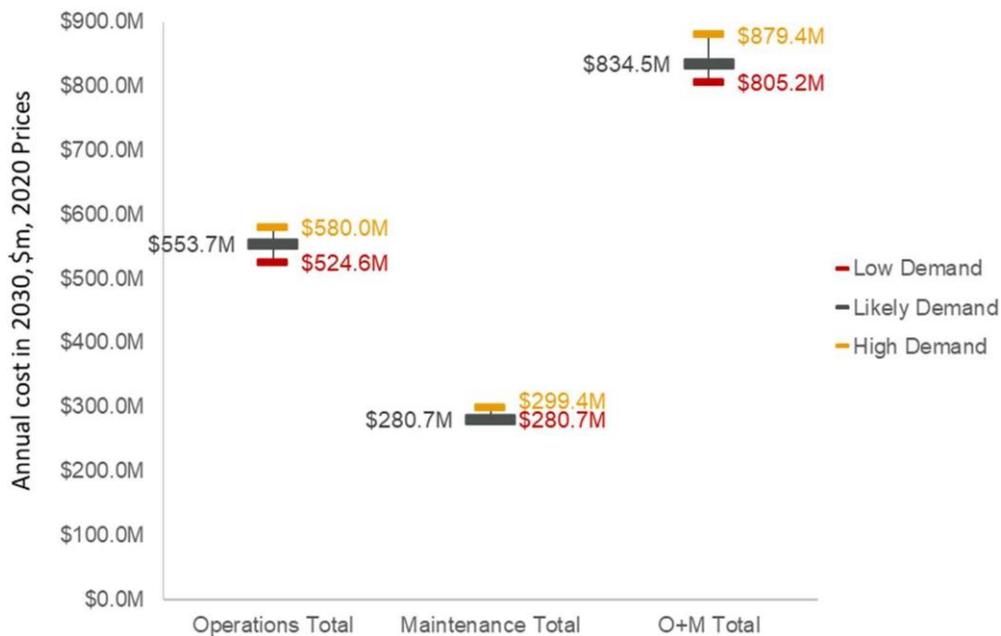


Figure 34: Range of OpEx costs (values in million CAD 2020)

The table below summarizes the operating and maintenance costs based on the low, likely, and high ridership demand scenarios.

Table 33 OPEX costs for high, likely, and low demand scenarios (million CAD 2020)

	TOR - OTT - MTL	MTL - QUE
Annual Maintenance Costs (High)	204	30
Annual Maintenance Costs (Likely)	185	30
Annual Maintenance Costs (Low)	185	30
Annual Operation Costs (High)	305	47
Annual Operation Costs (Likely)	281	46
Annual Operation Costs (Low)	255	44
30-year Maintenance Costs (High)	8,287	966
30-year Maintenance Costs (Likely)	7,115	946
30-year Maintenance Costs (Low)	5,902	945
30-year Operation Costs (High)	12,885	1,627
30-year Operation Costs (Likely)	11,354	1,543
30-year Operation Costs (Low)	9,242	1,465

Ridership scenarios sourced from Steer

Regarding cost composition, Figure 35 presents the breakdown. The categories with the highest yearly costs in 2030 are Train Maintenance – Staff, followed by Locomotive Engineers, TSA Costs, and Head Office Administration costs. The latter is mainly a fixed cost category, while the former three increase directly in proportion to the service levels.

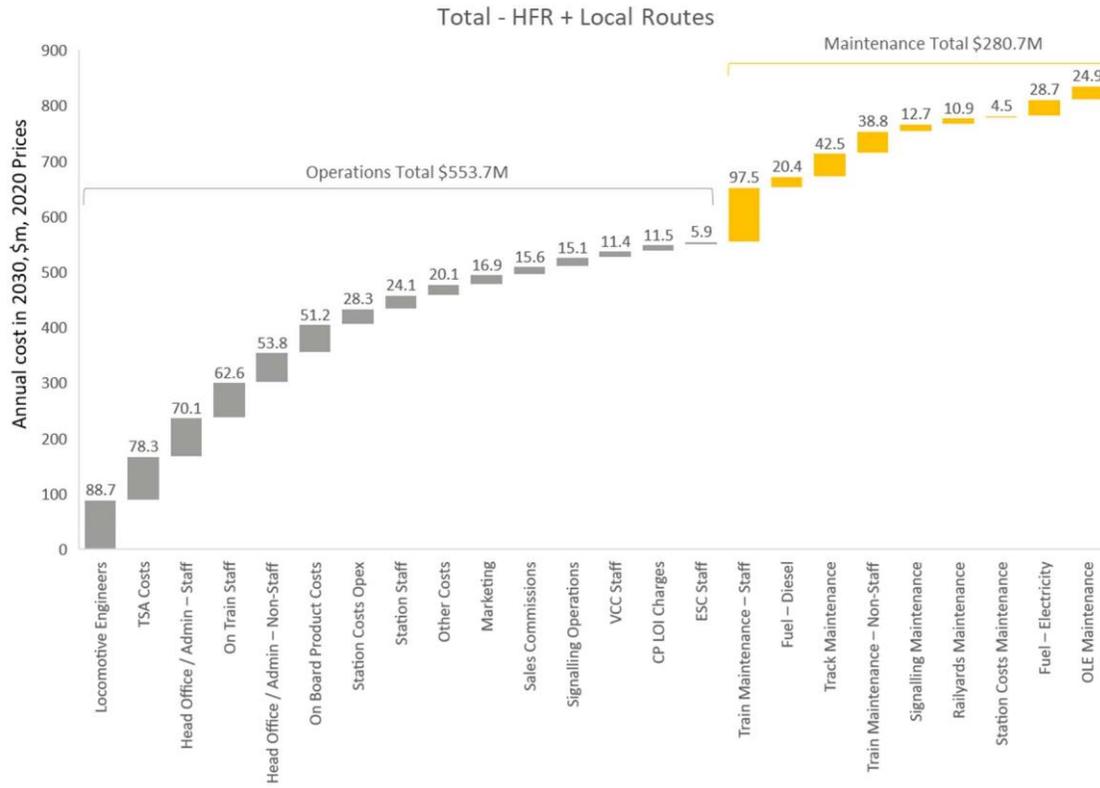


Figure 35 Composition of costs by category in 2030, Likely demand scenario

Figure 36 below shows the OPEX cost breakdown per route. The HFR Toronto-Montréal route accounts for 25 percent of the OPEX corridor costs. The four HFR routes together account for approximately two-thirds of the total corridor OPEX costs.

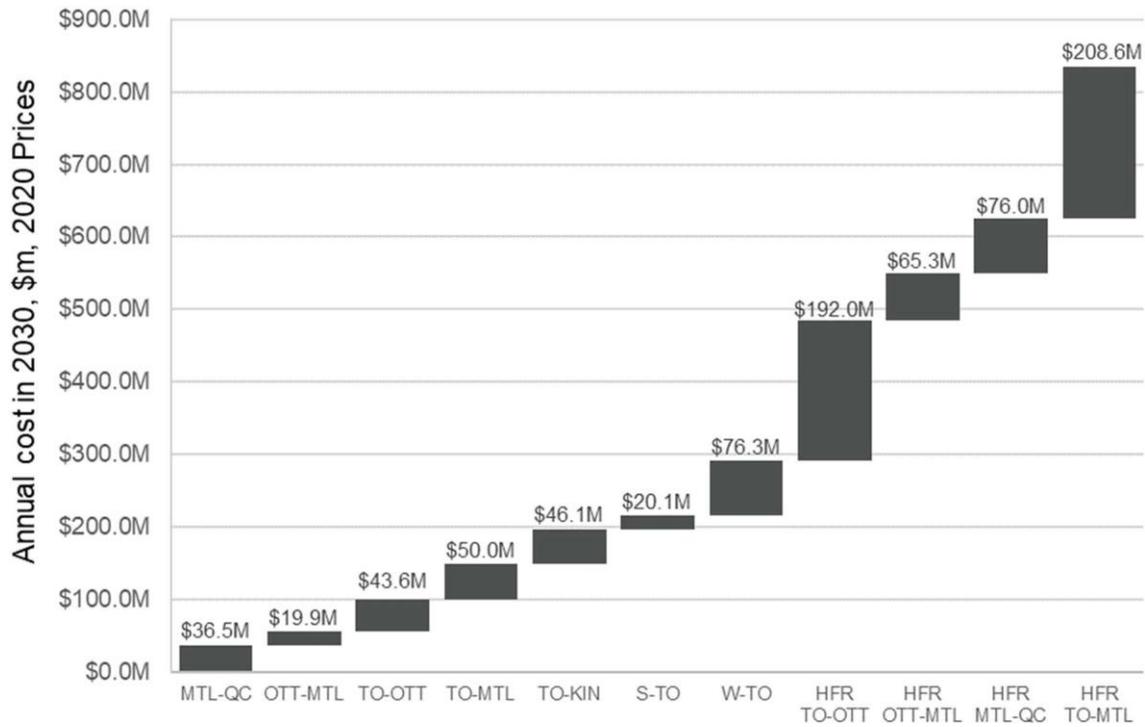


Figure 36 Composition of costs by route in 2030, Likely demand scenario

9.6. Lifecycle Costs analysis (LCCA)

LCCA are intended to represent major capital replacement costs required throughout the lifecycle of the infrastructure asset. The period of analysis for HFR's LCCA was tied to the potential concession period (30 years). The same accuracy range applied to the CAPEX (i.e., -25 percent to +40 percent) was applied to all developed life cycle costs.

The following table summarizes the 30-year total LCCA broken down by corridor segment (Toronto-Ottawa-Montréal, and Montréal-Québec City).

Table 34 30-year total LCCA results (infrastructure, electrification, and trackwork) [values in million CAD 2020]

	TOR-OTT-MTL	MTL-QUE	Total TOR-MQ
Total 30-year Infrastructure (High)	\$ 255.0	\$ 84.0	\$ 339.0
Total 30-year Infrastructure (Likely)	\$ 182.3	\$ 59.8	\$ 242.1
Total 30-year Infrastructure (Low)	\$ 137.0	\$ 45.0	\$ 182.0
Total 30-year Trackwork (High)	\$ 143.0	\$ 1.0	\$ 144.0
Total 30-year Trackwork (Likely)	\$ 102.1	\$ 0.8	\$ 103.0
Total 30-year Trackwork (Low)	\$ 77.0	\$ 0.6	\$ 77.6
Total 30-year Electrification (High)	\$ 76.0	\$ 22.0	\$ 98.0
Total 30-year Electrification (Likely)	\$ 54.8	\$ 15.4	\$ 70.3
Total 30-year Electrification (Low)	\$ 41.0	\$ 12.0	\$ 53.0
Total 30-year including electrification (High)	\$ 475.0	\$ 107.0	\$ 582.0
Total 30-year including electrification (Likely)	\$ 339.2	\$ 76.1	\$ 415.3
Total 30-year including electrification (Low)	\$ 255.0	\$ 57.6	\$ 312.6

Table 35 summarizes the Local rolling stock (with Extra-Long trainsets) life cycle costs for the 30-year period of analysis, both for diesel fleet (operational before HFR services begin) and electrified additional costs (once HFR becomes operational, and a passenger car is replaced by an EPC car).

Table 35 30-year total LCCA HFR Rolling Stock results (million CAD 2020)

	Local Rolling stock (Extra Long Trainset)
Total 30-year Local Diesel Rolling Stock (High)	\$ 742.7
Total 30-year Local Diesel Rolling Stock (Likely)	\$ 530.5
Total 30-year Local Diesel Rolling Stock (Low)	\$ 397.9
Total 30-year Local additional for Electrification (High)	\$ 41.7
Total 30-year Local additional for Electrification (Likely)	\$ 29.8
Total 30-year Local additional for Electrification (Low)	\$ 22.3
Total 30-year Local including EPC Cars (High)	\$ 784.4
Total 30-year Local including EPC Cars (Likely)	\$ 560.3
Total 30-year Local including EPC Cars (Low)	\$ 420.2

9.7. Net Present Value Analysis

To date, the JPO conducted a net present value analysis to understand the preliminary net cost implications (based on a 30-year evaluation period) of various alignment options for presentation to Government in July 2020, and an update was provided in November 2020 following direction to focus on Option 2 and discontinue further work on Option 1 and Option 3 at this time.

The analysis is independent of any procurement financing structure and costs.

Option 2 Bridge Analysis

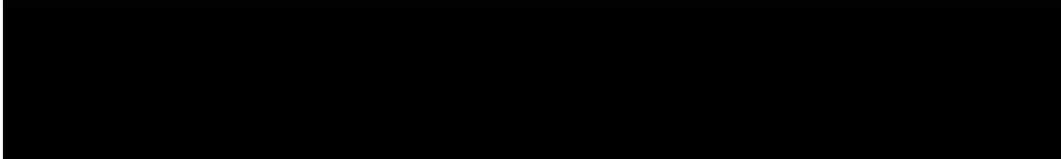
Following guidance to focus on Option 2, the JPO undertook further alignment development and de-risking which led to an updated NPV analysis for Option 2 in November 2020 and a further update in August 2021. The changes to NPV between November 2020 and August 2021 are summarized in the following bridge analysis.

Figure 37 Option 2 bridge analysis

Net Present Value	Option 2 (July 2020)	Option 2 (Nov 2020)	Option 2 (Aug 2021)	Option 2 Delta	Rationale for change (November 2020 vs August 2021)
	(C\$mm)	(C\$mm)	(C\$mm)	(C\$mm)	
Revenue	30,812	30,296	29,532	(763)	<ul style="list-style-type: none"> Station location updated from Eglinton to Kennedy Revisions due to diligence and further refinements
CAPEX ⁽¹⁾	(9,156)	(12,052)	(21,464)	(9,412)	<ul style="list-style-type: none"> Increase in infrastructure capex scope from further engineering refinement and significantly higher CN allowances and host 3rd party railway costs
OPEX & Maintenance (Incl. RS maintenance)	(28,599)	(26,746)	(26,801)	(55)	<ul style="list-style-type: none"> Increased opex due to greater total passengers, higher business class mix, and higher CP LOI charges
LCC ⁽²⁾	(1,673)	(290)	(344)	(54)	<ul style="list-style-type: none"> Increase in infrastructure LCC linked to higher base capex estimates Decrease in the length of electrified track Decrease in trackwork LCC due to less wear from load splitting as the estimates now consider double tracking
Rolling Stock Purchase ⁽¹⁾	(661)	(1,338)	(1,185)	153	<ul style="list-style-type: none"> Decrease in rolling stock purchase costs due to correction of a double counting of an EPC car and passenger car
Rolling Stock LCC	(707)	(895)	(852)	44	<ul style="list-style-type: none"> Decrease in rolling stock LCC due to the reduction in base rolling stock purchase costs
NPV @ 2.5%_Corridor Electrified	(9,984)	(11,025)	(21,113)	(10,088)	The overall decrease in NPV since the November 2020 update is primarily driven by inclusion of CAPEX items and impact on Revenues as a result of engagement with Host Railways

Please note:

- Construction CAPEX and rolling stock purchase do not assume inflation.



General Assumptions

The following assumptions were used for the purpose of calculating NPV:

Category	Source	Assumptions	Notes			
Inflation (July 2020)	JPO	<ul style="list-style-type: none"> • 2.0% for revenue • 2.5% for general costs • 0% for capex and rolling stock 	<ul style="list-style-type: none"> • Long Term CPI for Canada • Cost inflation is adjusted to account for higher growth associated with some cost items (e.g. wage) 			
Updated Inflation (Nov 2020 / Aug 2021)	OE	<ul style="list-style-type: none"> • 2.0% for revenue and general costs • 0% for capex and rolling stock 	<ul style="list-style-type: none"> • Inflation assumptions updated by OE based on long term inflation forecasts • Real growth accounted for in OE O&M model before inflation adjustment 			
Discount rate	JPO	• 2.5% ⁽¹⁾	• 10 year avg 30Y GoC benchmark bond			
Construction term (July 2020)	OE	• 4 years (2026 – 2029)	• Based on OE conservative estimate			
Updated Construction term (Nov 2020 / Aug 2021)	OE	• 4.75 years (2025 – 2030)	• Includes time for testing and commissioning			
Operating term	OE	• 30 years (2030 – 2059)				
NPV base year	JPO	• 2020	• Business Case year			
Operating Term Service Levels	Source	Option 1	Option 3	Option 2 (July 2020)	Option 2 (Nov 2020)	Option 2 (Aug 2021)
Operating Service Level 1a Start ⁽²⁾	JPO	2030	2030	2030	2030	2030
Operating Service Level 1b Start	JPO	2040	2035	2040	2035	2035
Operating Service Level 2a Start	JPO	2050	2045	2040	2045	2045
Electric Revenue (in \$2019 millions)	Source					
Total Electric Revenue	Steer	\$31,837	\$38,086	\$35,125	\$34,543	\$33,661

Figure 38 General assumptions used for calculating NPV

Construction Capex

Millions \$ 2020	Option 1	Option 3	Option 2 (July 2020)	Option 2 (October 2020)	Option 2 (July 2021)	Delta
TOM Infrastructure	\$4,100	\$11,080	\$4,770	\$7,268	\$9,954	\$2,686
MQ Infrastructure	\$2,390	\$2,390	\$2,390	\$2,712	\$3,771	\$1,059
TOM Right of Way	\$70	\$270	\$80	\$153	\$436	\$283
MQ Right of Way	\$20	\$20	\$20	\$144	\$344	\$200
TOM Third Party Costs	\$760	\$760	\$760	\$875	\$4,312	\$3,437
MQ Third Party Costs	\$180	\$180	\$180	\$175	\$3,836	\$3,661
Total ex. Electrification	\$7,520	\$14,700	\$8,200	\$11,327	\$22,653	\$11,326
TOM Electrification	\$1,824	\$2,161	\$2,256	\$2,665	\$2,647	(\$18)
MQ Electrification	\$933	\$933	\$933	\$736	\$929	\$193
Total w/ Electrification	\$10,277	\$17,794	\$11,389	\$14,728	\$26,229	\$11,501

	Option 1	Option 3	Option 2 (July 2020)	Option 2 (October 2020)	Option 2 (July 2021)	Delta
Total TOM	\$6,754	\$14,271	\$7,866	\$10,962	\$17,349	\$6,387
Total MQ	\$3,523	\$3,523	\$3,523	\$3,768	\$8,880	\$5,112

Figure 39 Construction capex

Rolling Stock Capex

Rolling Stock Costs (\$2020)	Source	Option 1 (Discarded)	Option 3 (Discarded)	Option 2 (July 2020)	Option 2 (Oct 2020)	Option 2 (July 2021)
Number of Trainsets	OE	16 Trainsets	16 Trainsets	16 Trainsets	22 Trainsets	24 trainsets
Cars per Trainset	OE	5 cars	5 cars	5 cars	7 cars	7 cars
Cost of new diesel trains + 7 car conversion of existing 32 diesel trains	Siemens + OE	\$495mm	\$495mm	\$495mm	\$1,265mm	\$1,102mm
Cost of new trains electric conversion	OE	+\$109mm	+\$109mm	+\$109mm	+\$150mm	+\$164mm
Cost of existing trains electric conversion	OE	+\$218mm	+\$218mm	+\$218mm	+\$218mm	+\$218mm

Figure 40 Rolling Stock Capex

9.8. Financial Structuring

9.8.1. Introduction

Feedback from the DMOC was for the JPO to focus on two procurements models - Design Build Finance and Maintain (DBFM) #1 and Design Build Finance Maintain and Operate (DBFOM with Revenue Risk) #3. An additional option of Design Build Finance Maintain and Operate (DBFOM) #2 was requested as a fallback option.

The Business Case Update – dated December 10, 2021, focuses on the following options and sub-options:

- DBFM #1 Availability
- DBFOM #2 Availability
- DBFOM #3 Revenue
 1. Partial Availability – Most costs are paid using availability subsidies with some exposure to revenue risk
 2. Volume – Most costs are paid using availability subsidies with some exposure to ridership risk

All structuring options presented thus far are based on capital and cost estimates without considering any economies of scale, efficiencies of operations, value of fiscal certainty to the public sector or value from private sector bid competitive tension.

The CIB has conducted a limited market engagement exercise since the PSR with a select group of major infrastructure developers, operators, lenders, and equity investors. The purpose of this market engagement was to focus on the DBFOM procurement model with specific attention to the following aspects:

1. Understand the market’s capability, expertise, capacity and willingness to take revenue and operations risk on a greenfield intercity railway project with some level of existing ridership.
2. Understand the environment (governance, control, pricing, minimum guarantees, etc.) necessary to allow for revenue / traffic volume to be reasonably transferred to attract private capital participation.
3. Understand the potential levers available to the operators and developers to optimize the operational efficiencies and maximize revenue opportunities.
4. Understand the market’s expertise and interest in an approach that involves early participation of the private sector during the development and procurement process (the “Pre-Development Agreement” or “PDA” approach).

Overall, the feedback obtained during the market engagement did not contradict the proposed financial structures contemplated in this section of the report and confirmed the JPO assumptions regarding the capacities of the debt and equity capital markets. Other elements of the feedback from the market engagement process have not been incorporated into the Business Case at this time.

9.8.2. Overview of Financial Structures

The two availability models the JPO has been asked to focus on are the DBFM 1 and DBFOM 2 models.

DBFM 1

Under this option, maintenance and rehabilitation activities regarding the following become responsibilities of the Private Partner: all civil works (e.g., tracks and structures (new and existing)), Rail Systems (e.g., signaling, communications and electrification (if selected)), and Stations (new and existing owned by VIA, “land or building”). Maintenance and rehabilitation activities regarding Rolling Stock and Facilities (Toronto Maintenance Center & Montréal Maintenance Center) are retained by Public Sector. All operational activities would continue to be retained by Public Sector, including dispatching and network planning. Based on the current Operating, Maintenance and Rehabilitation (OM&R) Cost Model developed by the OE, the percentage of annual costs transferred to the private sector is ~8% of total annual OM&R costs.

DBFOM 2

This option builds on DBFM #2, which transferred the responsibility for maintenance of new and existing track, stations, systems, signaling equipment, and rolling stock to the private sector, with the addition of operating responsibilities including train operations (e.g., on train service and onboard products), station operations (e.g., staffing and management of stations and customer center), and network planning activities (e.g., timetabling, dispatching, reservation systems) etc. All revenue management and performance contract management will be retained by the public sector. Based on the current Operating, Maintenance and Rehabilitation (OM&R) Cost Model developed by the OE, the percentage of annual costs transferred to the private sector is ~70% of total annual OM&R costs.

The JPO was also asked to investigate revenue risk transfer to the private sector under the DBFOM 3 model. The two sub-models that the JPO has focused on are the Partial Availability and Volume sub-models.

DBFOM 3 – Partial Availability

Under a Partial Availability model, most costs are paid using availability subsidies with some exposure to revenue risk. Partial Availability is a hybrid model where the private sector receives both a percentage of direct farebox revenues and fixed availability payments. The fixed availability payments are not guaranteed but linked to performance incentives (deduction and bonus regimes) like the availability model. The private sector’s return is tied to both performance and revenue. This creates incentives for the private sector to perform at high levels. Depending on market requirements, a revenue guarantee may be provided (e.g., during ramp-up).

Under a Partial Availability model, the private sector bids to two streams of availability payments:

- 1) Service Payments (inflation indexed) that pay for all operating period costs
- 2) Capital Payments (not linked to inflation) to cover majority of Senior Debt Service

The availability payments will be subject to standard performance deductions. In addition to the availability payments above, the private sector can bid to a percent of revenue exposure to pay for the equity distributions (and potentially a small portion of debt service payments). This equity return should on an overall basis be better than what can be achieved in an availability model given the greater cash flow volatility (i.e., attractive upside and acceptable downside). A base level revenue guarantee could be requested.

The below graph shows an illustrative breakdown of the revenues and costs as a percentage of total cash inflows under a Partial Availability Model.

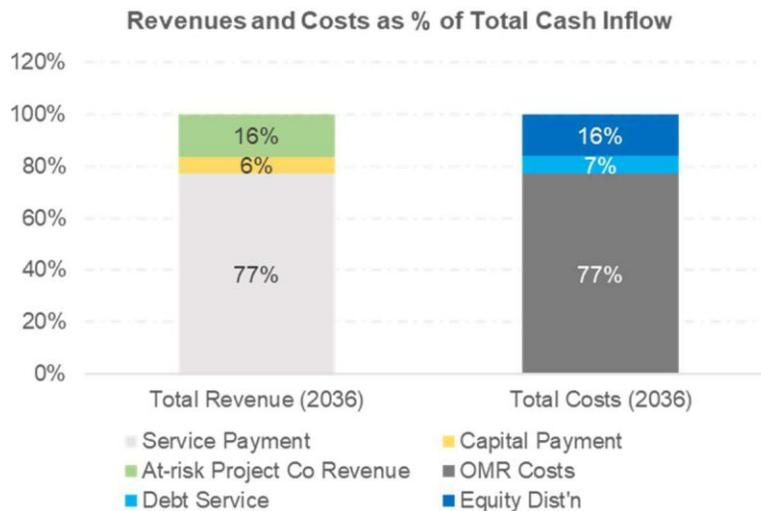


Figure 41 Revenue and cost breakdown as a percentage of total cash inflows under a Partial Availability Model

DBFOM 3 – Volume

Under a Volume model, most costs are paid using availability subsidies with some exposure to ridership risk. Volume is a hybrid model where the private sector receives both indirect volume-linked revenue and fixed availability payments. The public sector pays the private sector a shadow fare on a per unit basis. The unit can be based on a per passenger kilometer (PAX-KM) calculation. Revenue management responsibility resides with the private sector for it to be willing to undertake full volume risk. Revenue collected is then remitted back to the public sector. Depending on market requirements, a volume guarantee may be provided (e.g., during ramp-up).

This procurement model provides an opportunity for the following payment structure:

- 1) Fixed Capital Payments during ramp-up period, if required (not linked to inflation)
- 2) Service Payments for all OM&R costs (inflation indexed)
- 3) Shadow toll per passenger km per service level (inflation indexed)

Bidders can optimize their bid through an optimal capital structure achieved by a combination of shadow toll revenue and potentially a volume guarantee.

The below graph shows an illustrative breakdown of the revenues and costs as a percentage of total cash inflows under a Volume Model.

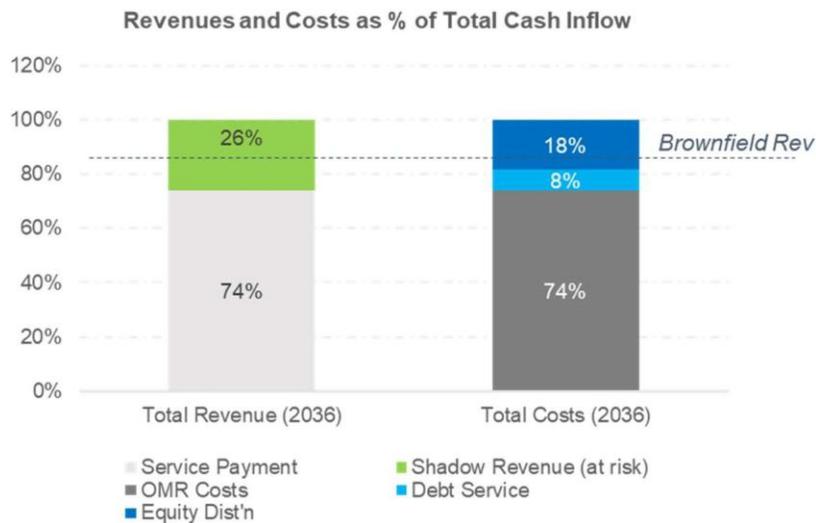


Figure 42 Revenue and cost breakdown as a percentage of total cash inflows under a Volume Model

9.8.3. Key Structuring Decisions and Assumptions

The following set of decisions should be considered by the Contracting Authority when structuring a major infrastructure project at the Business Case level and in determining the level of public and private participation in a Project:

Procurement Model	DBFM (availability) and DBFOM (availability & revenue) are shortlisted procurement models that need to be structured
Level of Government Funding during Construction	Percentage of capital costs funded by Contracting Authority & the split between Construction Period Payments vs a lumpsum Substantial Completion Payment
Target Bond Rating	Long Term Bond rating targeted for the VIA HFR Project to ensure bonds can be sold successfully as a broadly marketed transaction at Financial Close
a DSCR / Resiliency	Minimum DSCR and Resiliency required to be achieved to meet the targeted bond rating
b Proportion of Debt vs. Equity	Minimum gearing required to be achieved to meet the targeted bond rating
Market Capacity & Liquidity	Equity, long term and short term debt capacity / liquidity in the market
a Debt and Equity, Cost and Returns	Rates of return for equity and debt (short and long)
These decisions will drive sizing of on-going subsidy required for capital repayment (if any)	

Figure 43 Key structuring decisions

Note: The Debt Service Coverage Ratio (“DSCR”) is a coverage ratio that measures how many times the cash flows of the project can pay the scheduled interest and principal on the senior debt.

Structuring Decision 1 – Government Funding Amount

The first major structuring decision that must be made is to determine what percentage of the total capital cost the government would like to fund to balance affordability with risk transfer and long-term private participation. Factors to consider include the trade off between short term fiscal budgets and skin-in-the-game & long-term fiscal budgets.

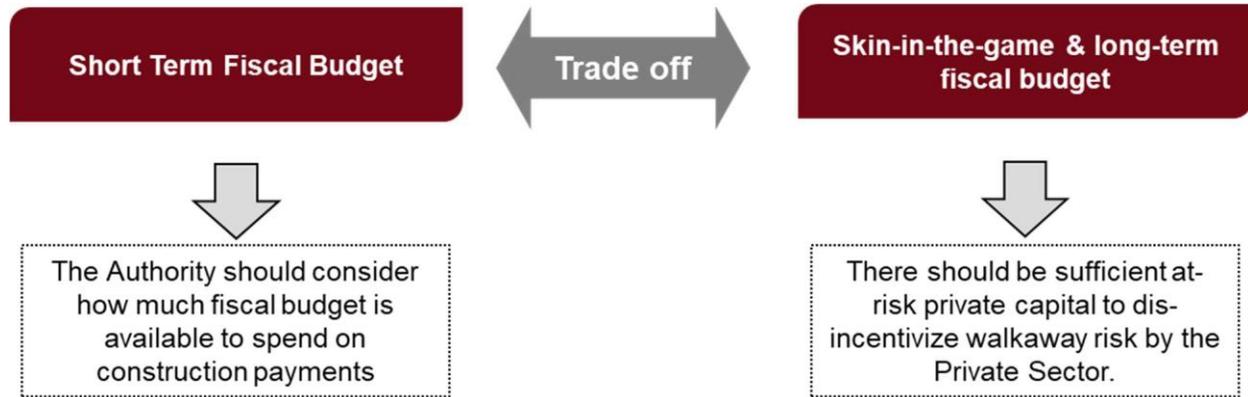


Figure 44 Trade offs between short term fiscal budgets and skin-in-the-game & long-term fiscal budgets

As more risks are transferred to the private sector, a greater amount of private capital, and thus a lower amount of public funding, should be utilized to ensure there is sufficient equity skin in the game.

Typical Range of Public Construction Funding by model in the Transit / Transport Sector

VIA HFR – Procurement Model	DBFM (availability)	DBFOM (availability)	DBFOM (revenue)
Construction Funding (% of capital cost)	85%	70 – 85%	60 – 70%

Figure 45 Typical range of public construction funding by model in the transit/transport sector

Structuring Decision 2 – Target Rating & Key Financial Metrics

The target credit rating for the project debt acts as a constraint for the structuring of the Project. The target rating will impact the cost of debt, as higher rated debt facilities charge a lower rate of interest. The target rating will also impact the amount of liquidity in the market, as higher rated debt facilities are likely to attract a deeper market.

For the VIA HFR Project, the JPO is recommending a target rating of BBB as this is lowest rating achieved on other transit projects in Canada (note that it is not impossible for the private sector to manage to achieve a rating better than BBB). Below are the debt metrics typically required by rating agencies in order to achieve a BBB rating:

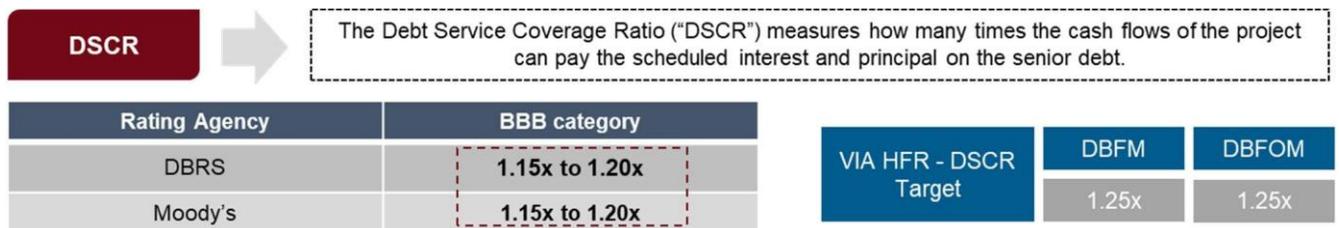


Figure 46 Debt Service Coverage Ratio (DSCR) metric

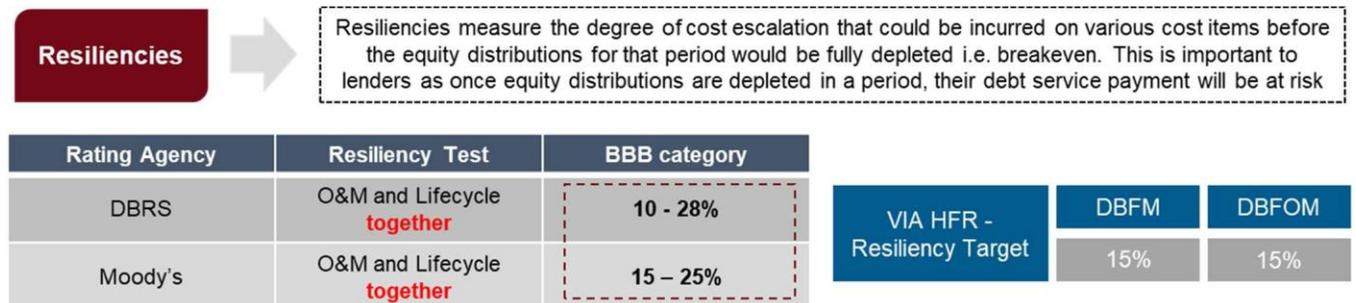


Figure 47 Resiliencies metric

Structuring Decision 3 – Market Capacity

Based on high level discussions with [REDACTED] the following tables show the anticipated capacity of the short-term lending market and long-term bond market for BBB-rated projects:

Short – Term Capacity			
Canadian Banks	Japanese Banks	Short Bonds	Total
\$500m	\$500m	\$500m	\$1500m

Figure 48 Anticipated short-term capacity of the lending market for BBB rated projects

BBB Long – Term Capacity			
Long Bonds – Canadian	Long Bond – US in CAD\$	Long Bond – US in US\$	Total
\$1000m	\$500m	\$1000m	\$2000m - \$2500m

Figure 49 Anticipated long-term capacity of the BBB bond market

Beyond \$2.0bn in long term debt, pricing is expected to increase by 50bps. To attract the American Bond market in non-CAD\$, swaps will need to be provided to protect for currency swap breakage in the make whole calculations in case of default [REDACTED]. This may result in contingent liabilities and potentially higher transactions costs.

The following table shows the anticipated equity capacity from contractors and other equity investors:

Equity Capacity		
Contractor + Preferred Equity	Other Equity	Total
\$100m - \$200m	\$500m - \$800m	\$600m - \$1000m

Figure 50 Anticipated equity capacity

9.8.4. Structuring Approach

The primary change to the inputs for the structuring analysis since the November 2020 analysis is the significant increase in capex estimates and therefore the Total PPP Construction Cost.

The structuring approach taken to manage the increase in construction costs has been to increase the government funding percentage to absorb the increased construction costs while maintaining a similar capital structure as the previous analysis.

The updated revenue and OM&R cost assumptions also impact the structuring outputs, however to a much lesser degree.

No changes have been made to the previous approach that balanced the conflicting needs of lowest cost to the Government against sufficient levels of private capital required for risk transfer purposes.

Given that a BBB flat rating for the long-term debt remains the targeted rating, the following assumptions have been held constant from the previous analysis:

- Costs of capital (including debt, equity, and CIB facilities)
- Capital market capacity constraints (~\$2bn for long-term debt and ~\$1bn for equity)
- Minimum resiliencies and DSCR profiles

No changes to the structuring assumptions have been made based on the recent feedback from the HFR market engagement discussions.

9.8.5. Financial Structuring Outputs
Funding and Financing of Capital Costs (Electric Option)

The table below illustrates the government contributions and long-term private financing contributions that are utilized to fund and finance the construction of the project. The table also displays the interest rate and rate of return assumptions for each source of financing.



Calendar Year	DBFM1	DBFOM2	Partial AP	Volume
Nominal \$ Billion				
Construction Contribution - November 2020	\$11.9	\$10.0	\$10.0	\$10.0
Substantial Completion - November 2020	\$2.9	\$3.1	\$3.1	\$3.1
Increase in Government Contributions - August 2021	\$4.8	\$4.8	\$4.7	\$4.7
Total Government Contributions - August 2021	\$19.6	\$17.9	\$17.8	\$17.8
% of Government Contribution	88%*	80%*	80%*	80%*
Long Term Private Debt	\$2.0	\$1.6	\$1.6	\$1.6
Private Equity	\$0.7	\$0.8	\$0.8	\$0.8
CIB Debt	--	\$2.0	--	--
CIB Equity	--	--	\$2.0	\$2.0
% of Long-Term Private Capital	12%	20%	20%	20%

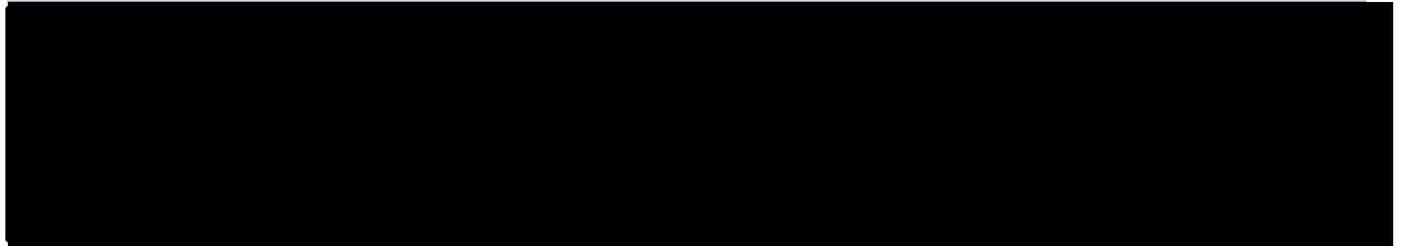


Figure 51 Funding and financing of capital costs (electric option)

Project Cost (Electric Option)

Please note that the following project cost information is based on the Alignment Option 2 and are the “likely” values prepared without the benefit of project optimization or revenue sensitivities. As such, the project cost values contained below are subject to change over the normal course of project evaluation and refinement.

The below table provides a breakdown of the various project costs that will be incurred on the HFR project as well as the project revenues. Line K – Total Project Life Subsidy provides the summation of the total cost of the project to the government net of the project revenues retained by the government. Line M – Net Total Project Life Government Subsidy calculates the total project cost to government above the existing BAU costs by subtracting the BAU Existing Government Subsidy from the Line K – Total Project Life Subsidy mentioned above.

A key conclusion from this table is that an OMR efficiency of 4 – 12% would be required to pay for the DBFOM risk transfer premium over the DBFM model. The OMR efficiency is the level of private sector efficiencies that would need to be achieved through a competitive bidding process and private sector innovation to offset the cost differential between the procurement models.

Nominal - \$ Billion		DBFM1	DBFOM 2	DBFOM 3 Partial AP	DBFOM 3 Volume
Project Costs					
A	Construction Subsidy	19.6	17.9	17.8	17.8
B	Availability Payments – Operating, Maintenance & Rehabilitation (OMR)	6.2	42.8	44.0	44.0
D					
D	Farebox Revenue / Shadow Toll Income	Not applicable	Not applicable	8.6	10.7
F					
F	Public Sector Retained Capital Costs	12.7	12.7	12.7	12.7
G					
G	Public Sector Retained Operating Costs	53.2	17.0	15.8	15.8
I					
I	Less: Revenue Retained by Public Sector	(59.9)	(59.9)	(51.3)	(59.9)
J					
J	Less: Farebox Revenue Retained by Private Sector	Not applicable	Not applicable	(8.6)	Not applicable
L					
L	Less: BAU Existing Government Subsidy (figure provided by TC/EY)	(5.0)	(5.0)	(5.0)	(5.0)
OMR Efficiency Required to Pay for DBFOM Risk Premium over DBFM		--	4%	11%	12%
<i>(level of bidder efficiency, achieved through competitive tension in bidding process, which would offset the cost differential between models)</i>					

Figure 52 Project costs (electric option)

Cost to Government of Canada (Electric Option)

The following table provides a similar breakdown of the total project costs, however this table is organized by phase of the project in order to show the total government cost during construction and the total government cost during operations. The Line K – Total Project Life Subsidy summation of the total project cost to government remains the same as in the previous table.

Nominal - \$ Billion	DBFM 1	DBFOM 2	DBFOM 3 Partial AP	DBFOM 3 Volume
Government cost during Construction: A+F				
A Construction Subsidy	19.6	17.9	17.8	17.8
F Public Sector Retained Capital Costs	12.7	12.7	12.7	12.7
Total Cost During Construction	32.3	30.6	30.5	30.5
Government cost during Operations: B + C + D + G – I – J				
B Availability Payments – Operating, Maintenance & Rehabilitation (OMR)	6.2	42.8	44.0	44.0
D Farebox Revenue / Shadow Toll Income	Not applicable	Not applicable	8.6	10.7
G Public Sector Retained Operating Costs	53.2	17.0	15.8	15.8
I Less: Revenue Retained by Public Sector	(59.9)	(59.9)	(51.3)	(59.9)
J Less: Farebox Revenue Retained by Private Sector	Not applicable	Not applicable	(8.6)	Not applicable
Total Project Life Subsidy (Costs during Construction + Operations)				
• Total Cost During Construction	32.3	30.6	30.5	30.5
• Total Cost During Operations	4.9	8.3	11.2	11.7
K Total Project Life Subsidy (K = H-I-J) <i>(project cost to government)</i>	37.1	38.9	41.8	42.2

Figure 53 Cost to the Government of Canada (electric option)

Key Metrics for Government of Canada (Electric Option)

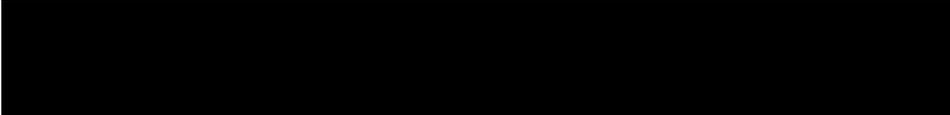
The below table summarizes the key financial structuring metrics and outputs shown in the Financial Structuring section. Additionally, the table provides a qualitative evaluation of the degree of risk transfer from the government to the private sector and the degree of budget & fiscal scenario that each procurement model achieves.

Categories of metrics for comparison		DBFM 1	DBFOM 2	DBFOM 3 Partial AP	DBFOM 3 Volume
Funding and Financing Contribution					
1	% of Government contribution during and end of construction	88%	80%	80%	80%
2	% of Private Sector contribution during Long Term	12%	20%	20%	20%
Project Risk Transfer					
4	Risk Transfer From Government to Private Sector	Low	High	High	High
5	Budget & Fiscal Certainty	Low	High	High	High
6	% of Ongoing Operating Costs Retained by Government and subject to variability	92%	30%	28%	28%
Project Subsidies					
7	Total Project Life Subsidy (over 30 years <u>net</u> of revenue) – nominal \$bn	37.1	38.9	41.8	42.2
8	Operating Cost Efficiencies required to offset DBFM Total Project Life Subsidy	--	4%	11%	12%

Figure 54 Key metrics for the Government of Canada (electric option)

9.8.6. Project Cost Key Commentary

When comparing the Total Project Life Subsidy across different procurement models, it is important to consider the following caveats in order to properly assess the differential:

- 1) The Total Project Life Subsidy delta is driven by the differing government funding percentages
 - The DBFM1 model utilizes a government funding percentage of 88% while the DBFOM2 / DBFOM3 models utilize 80%
 - This is due to the need for a higher amount of private financing to ensure adequate skin-in-the-game for procurement models that transfer a greater amount of responsibilities to the private sector
 - If the government funding percentage for DBFM1 was equalized to the 80% utilized in the DBFOM models, the resulting Net Total Project Life Subsidy for DBFM1 would be ~7% higher than the DBFOM2 model as per Figure 54 below
- 2) Financing costs for DBFOM models are typically greater than DBFM financing costs due to the higher cost of capital required by private sector when transferring operational and revenue/volume risk
 - 
 - Please see figure 55 for further details on the cost of capital assumptions under each model
- 3) The OM&R cost assumptions are consistent between models and do not consider any private sector innovation or efficiencies on the portion of transferred costs
 - Participants of the HFR market engagement have confirmed that the scale of the HFR project presents opportunities for optimization and efficiencies that can be harnessed through scope and risk transfer under a DBFOM model
- 4) Under DBFM 1, the structuring analysis does not include any increase in costs that VIA as the public sector operator would incur if responsible for HFR operations in addition to the existing BAU operations

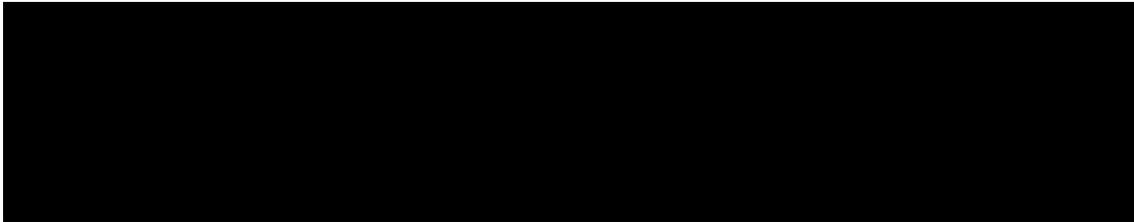
Nominal - \$ Billion		DBFM1 – 88% Gov't	DBFM1 – 80% Gov't	DBFOM 2
Project Costs				
A	Construction Subsidy	19.6	18.0	17.9
B	Availability Payments – Operating, Maintenance & Rehabilitation (OMR)	6.2	6.2	42.8
D				
D	Farebox Revenue / Shadow Toll Income	Not applicable	Not applicable	Not applicable
F				
F	Public Sector Retained Capital Costs	12.7	12.7	12.7
G				
G	Public Sector Retained Operating Costs	53.2	53.2	17.0
I				
I	Less: Revenue Retained by Public Sector	(59.9)	(59.9)	(59.9)
J				
J	Less: Farebox Revenue Retained by Private Sector	Not applicable	Not applicable	Not applicable
L				
L	Less: BAU Existing Government Subsidy (figure provided by TC/EY)	(5.0)	(5.0)	(5.0)

Figure 55 Project Cost - Normalized DBFM1 Gov't Funding Percentage

9.8.7. Financial Structuring Key Takeaways

The financial structuring work conducted by the JPO has resulted in the following list of key takeaways:

- Fiscal & budget certainty over transferred activities can be achieved for the duration of the PPP contract.
- Economies of scale, optimization and efficiencies from integration that are bid and contracted at the time of Financial Close are expected to be achieved through a fixed price contract over 30 years.
- Compared to DBFM #1 procurement model, the efficiency in operating, maintenance, and lifecycle costs required to offset the financing premium under DBFOM #3 and #2 procurement models in the base case is:
 - ~4% efficiency in DBFOM Availability models; and
 - ~11 - 12% efficiency in DBFOM Revenue models
- DBFOM and DBFOM Revenue procurement models have higher financing premiums as a result of:
 - Greater percentage of long-term private financing (20%) in DBFOM models compared to DBFM models (12%)
 - Higher weighted average cost of capital (WACC) in DBFOM Revenue models to reflect higher risk premiums associated with the model



10. Deliverability and Operations Case

Modern intercity rail systems require infrastructure, rolling stock, and rail systems that deliver on passenger expectations and support operations. Therefore, HFR requires a customer-focused service plan that attracts and retains passengers, by providing the infrastructure and facilities to support necessary operations throughout, and beyond, the concession period. The HFR stations need to facilitate seamless interchange with other modes of transport within the major cities, be accessible, and planned with future growth in mind, whether by accommodating for service growth through shared host railway stations or dedicated HFR stations and city accesses.

Conceptual Service Plan

The HFR conceptual service plan provides the basis for the infrastructure, technology, and delivery strategies and requirements. HFR includes new trains on a separate new passenger route between Toronto and Québec City with a customer focused service proposition for passengers including additional frequencies, lower journey times, and an opportunity for better on-time performance. HFR services are planned to increase frequencies on the Toronto – Ottawa, Toronto – Montréal, Ottawa – Montréal, and Montréal – Québec City routes. HFR services will complement the existing local services in the Windsor - Québec City Corridor (Figure 56), although the frequencies and calling patterns on Local Services will be revised as a consequence of journey opportunities provided by HFR. Passengers may connect with local services (i.e., trains via Kingston and Drummondville, or trains to/from southwestern Ontario) at the major city stations.

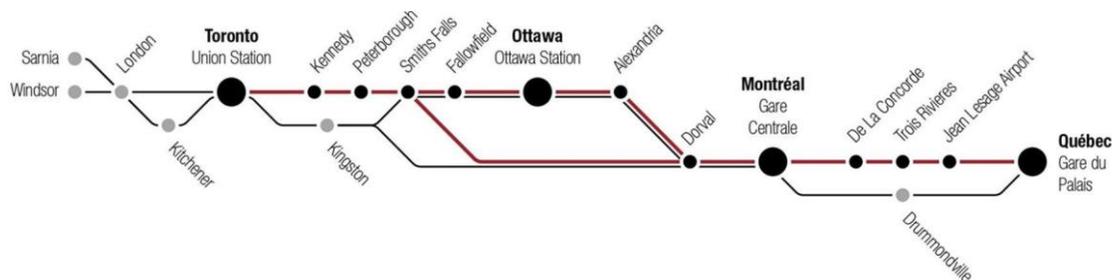


Figure 56: Map of existing Corridor services and planned HFR services

The JPO assessed the number of round-trip frequencies and seats to define Service Levels that are required to accommodate forecasted HFR passenger demand. The project has used the Siemens Charger rolling stock (currently being procured by VIA as part of its Fleet Replacement Program) as the reference vehicle from which seat capacity and journey times can be modelled and assessed. Higher frequencies are required to accommodate the growth on the Toronto – Ottawa, and Toronto – Montréal routes. These service levels (presented in Section 9.3 and repeated in Table 36) provide initial parameters for the planning and design of the HFR system to accommodate operations over the thirty-year period. Final frequencies and required service level changes will be determined after results are considered from the ongoing optimization exercise.

Table 36: HFR Service Levels: Planned frequencies and seats per train

HFR Service Levels	Service Level 1	Service Level 2	Service Level 3
Time Frame	2030-2034	2035-2044	2045-2059
Daily Round Trip Frequencies			
Montréal – Toronto	12	15	18
Toronto – Ottawa	12	15	18
Ottawa – Montréal	12	12	12
Montréal – Québec City	10	10	10
Train Size (Number of Cars and Seats per Train)			
Montréal – Toronto	7 / 409	7 / 409	7 / 409
Toronto – Ottawa	7 / 409	7 / 409	7 / 409
Ottawa – Montréal	4 / 235	4 / 235	4 / 235
Montréal – Québec City	4 / 235	4 / 235	4 / 235

Indicative journey time estimates, see Table 37, for HFR were advanced based on the selected alignment and preliminary assumptions for dwell times, stopping patterns, and reference rolling stock performance. The following aspects of the reference rolling stock have influenced the currently modelled journey times:

- The indicative journey times modelled are based on the use of the Siemens Charger reference vehicle operating in diesel mode.
- Given the presence of at-grade crossings, regulated speeds (110mph) across them, and conditions laid out in the MSA contract between VIA Rail and the reference rolling stock provider, modelled speeds are constrained to a maximum of 110mph.
- Indicative journey times include an allowance for variability in daily operations resulting from interfaces with host railway trains or services.

Further work is required for the JPO to validate the target journey times including more detailed modelling of all HFR, local, commuter and freight movements within the corridor as the project progresses along with assessing the most appropriate vehicle for HFR operational requirements.

Table 37: Journey times for key city pairs

Journey Time	HFR Fastest Journey Time	HFR Slowest Journey Time	HFR Average Journey Time
Toronto – Montréal	3:59	4:19	4:10
Toronto – Ottawa	2:50	2:58	2:54
Ottawa – Montréal	1:40	1:47	1:43
Montréal – Québec City	2:45	2:56	2:51

This Deliverability and Operations Case section covers the status of conceptual studies, due diligence, and analysis to date, along with the decision gate reviews required before progressing to basis of design and pre-procurement activities – in particular reference concept design, procurement documentation, and the Impact Assessment – can progress.

The key next steps require refinement of more specific project objectives and priorities such that the concept design of HFR can be advanced and optimized with them. These objectives would then facilitate the formal initiation of the Impact Assessment, Concept of Operations, Basis of Design, cost estimate classification progression and advancement of strategies for host railway access, rolling stock requirements, and operations and maintenance.

10.1. Infrastructure

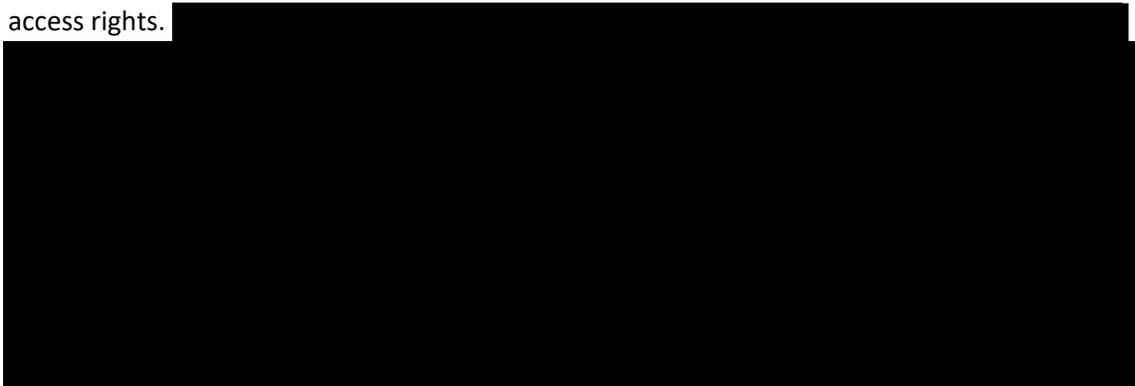
The passenger and operational requirements drive the HFR conceptual service plan. This in turn determines the infrastructure required. The current status for defining infrastructure requirements for the project is summarized for city access, intercity alignment, stations, and rail/road crossings in the following sub-sections.

10.1.1. City Access

The JPO was tasked with reviewing and assessing alignment options for access in Toronto, Montréal, and Québec City, where HFR will interface with freight or regional transit operators. This section provides a summary of the current progress on City Access.

The focus to date has been on Toronto and Montréal, as they carry the most complex challenges with regards to bringing HFR to these major centers; in particular, with regards to capacity, on-time performance aspects, and future proofing through either shared track or station facilities owned and operated by others. Further assessment is required by the JPO to de-risk the city access along with defining the optimum solution that caters to the operational and performance needs of HFR. The JPO has initiated discussions with host railways (e.g., Metrolinx, exo, CN, CP) on capacity and requirements for HFR to access Toronto Union Station, Montréal Gare Centrale, and Québec City Gare du Palais.

The JPO has also completed a preliminary review of both commercial agreements and regulated access rights (discussed further in Section 10.3). Operational benefits can be achieved through the concept of operations, whether affected by commercial agreements and/or regulated access rights.



Toronto

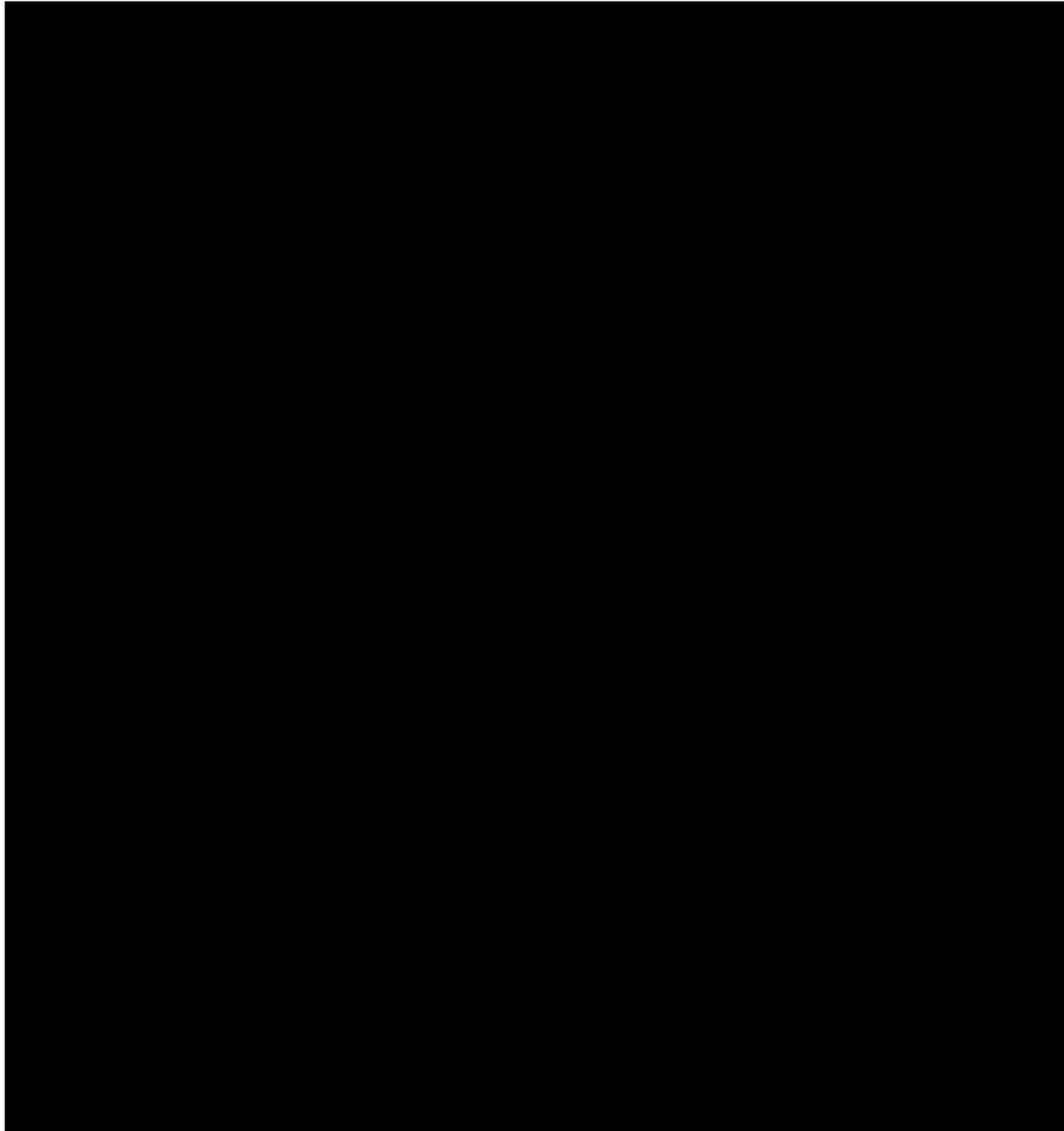
The current HFR proposal assumes Toronto Union Station as a terminus station. The JPO has explored various options to access Toronto Union station. The current scheme, based on Metrolinx recommendation for HFR, is to utilize the Metrolinx Uxbridge subdivision. The JPO has initiated discussions with Metrolinx to assess track and platform capacity to accommodate opening day and service level growth requirements for HFR. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

35 [REDACTED]
36 [REDACTED]



To meet on-time performance requirements and serve projected passenger volumes, there may be a need for: additional platforms, operational changes within the station to manage concurrent services; and/or further de-risking in assessing other potential locations for the HFR service to terminate in Toronto (i.e., terminating at an alternate station to: alleviate congestion, improve on-time performance, enhance the passenger experience, and facilitate future capacity). Alternate station locations would require assessment of ridership, benefit, cost, and risk. Discussion of these opportunities to optimize the alignment to meet on-time performance

requirements and to serve projected passenger volumes is discussed in the Optimization addendum.

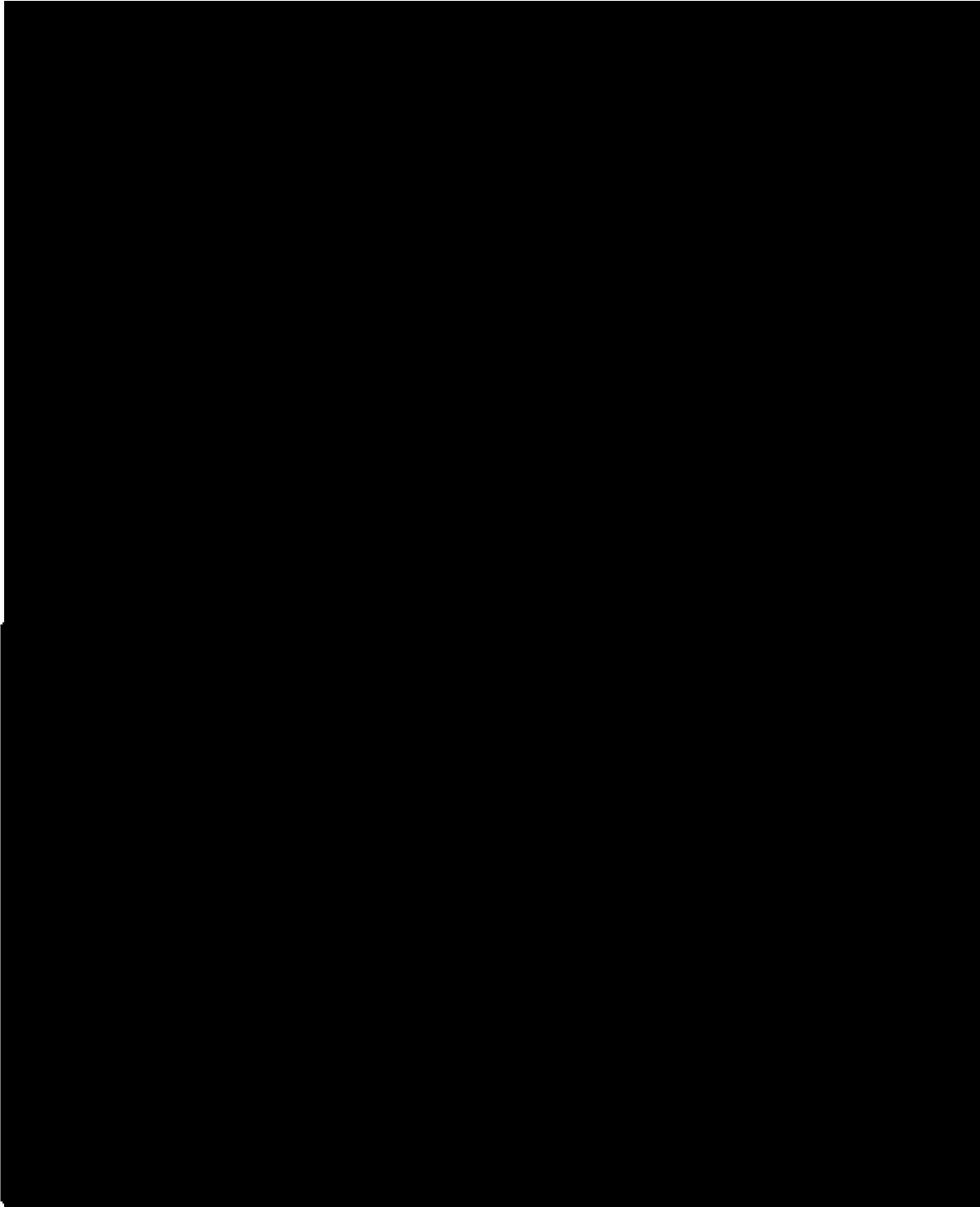
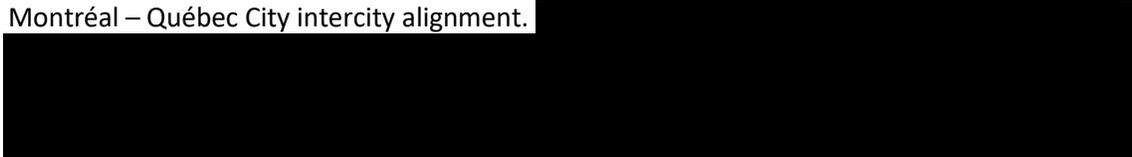


Figure 57 Access to Toronto Union Station

Montréal

The current HFR proposal assumes Gare Centrale as the main station in Montréal. The original proposal for High Frequency Rail considered a route through Mont Royal Tunnel to access the Montréal – Québec City intercity alignment.



The JPO identified and assessed alternative options for the Montréal City Access towards Québec City including consideration of alternate stations and routes.

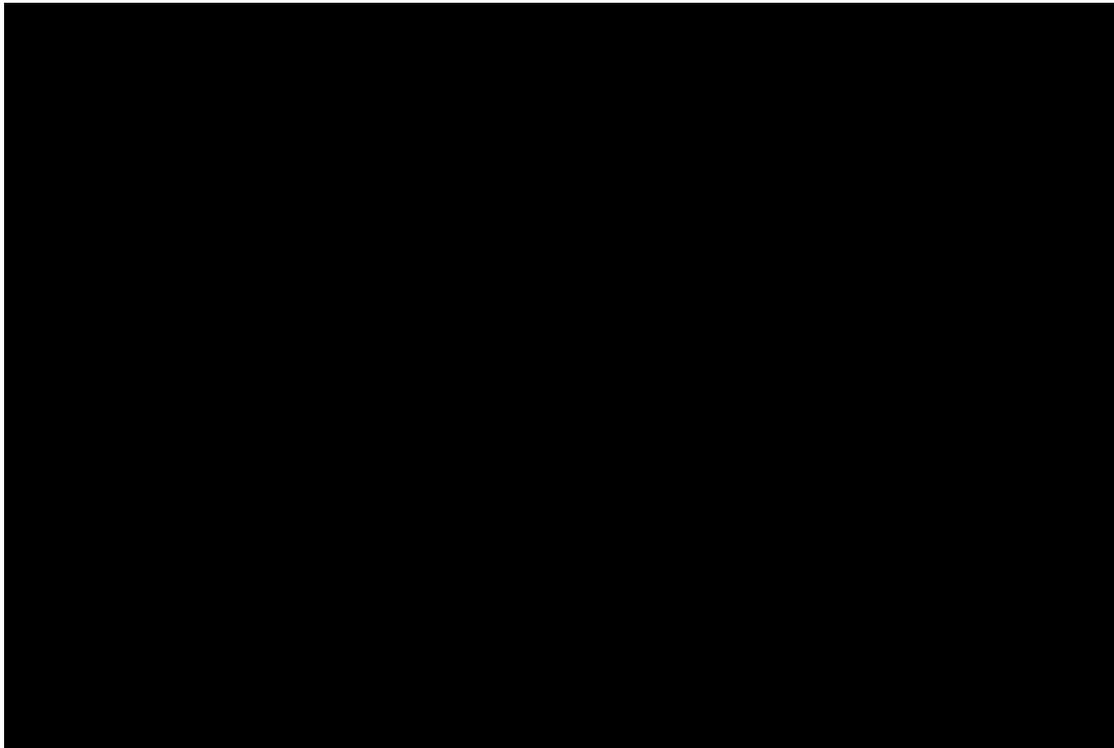
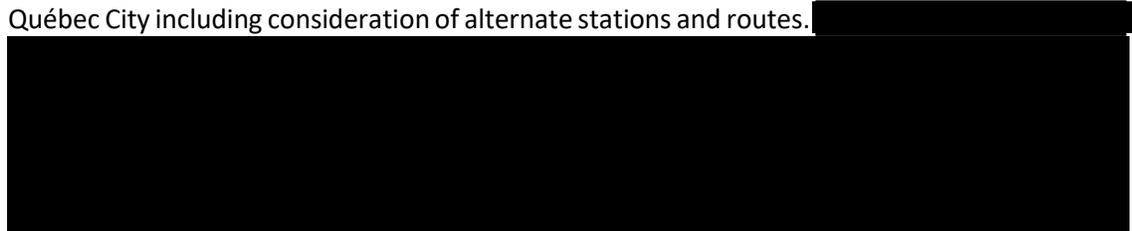


Figure 58 Access to Gare Centrale

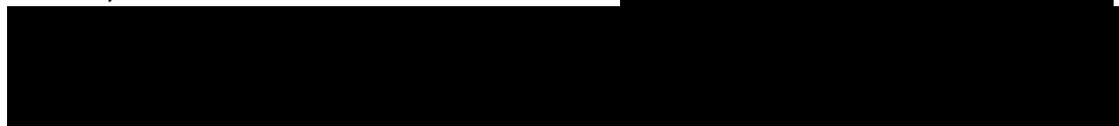
In the current HFR proposal, all HFR trains to/from Gare Centrale use host railway (primarily CN) controlled tracks on the island of Montréal. Existing capacity on CN corridors in Montréal is a constraint. HFR operation on host railway infrastructure presents risks related to continued prioritization of freight movements versus intercity rail movement. CN is assessing capacity,

infrastructure requirements, and capital cost for new infrastructure to enable two HFR tracks in its controlled right-of-way on behalf of the JPO. The capital cost estimates provided to the JPO have been revised since December 2020 to reflect changing assumptions:

- An initial high-level order of magnitude estimate of [REDACTED] to provide capacity for 36 trains per day to/from Gare Centrale (which were the frequencies identified by VIA in its original 2016 study);



In the current HFR proposal, all HFR trains to/from Québec City will also use the CP Parc Sub to access the island from the north and connect to CN St-Laurent sub (before continuing on CN as described above). The cost of constructing a dedicated corridor along the CP Parc Sub has currently been included within the CAPEX estimate. [REDACTED]



³⁸ \$491 million of Targeted Investments were announced in 2021. \$391 million is associated with works identified in the \$7.6bn estimate by CN; the remaining \$100 million is related to Dorval Hub. These are all excluded from the HFR Capex Estimate.

Québec City

The current HFR proposal assumes Gare du Palais as the terminus station in Québec City. Access to Gare du Palais uses CN-controlled right-of-way where freight trains have traffic priority. CN is assessing capacity, infrastructure requirements, and capital cost for new infrastructure to enable HFR trains in its controlled right-of-way on behalf of the JPO. Capital costs for access in Québec City [REDACTED] Further dialogue with CN and due diligence is required to assess and validate this estimate and [REDACTED]

10.1.2. Intercity Alignment

In general, the selected alignment follows active or abandoned CP rail corridors. In places, tight curves have been replaced with smoother curves to permit a maximum design speed of 201 kph (125 mph) (i.e., Class 7 track). It should be noted however that under the current Transport Canada regulations, the presence of 1100+ at-grade crossings, and reference vehicle performance³⁹ limits the maximum operating speed to 177 kph (110 mph) (discussed further in Section 10.1.4).

Current requirements for single or double track sections for HFR are based on the highest HFR frequencies within the 30-year period as assessed by the JPO. Higher levels of double track would increase the resiliency of the overall corridor for on-time performance and capacity for additional frequencies beyond the first 30 years.

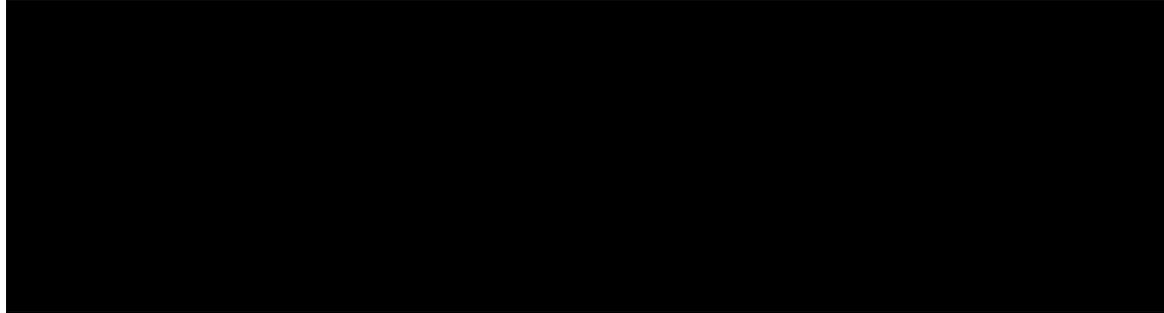
The intercity alignment for HFR will utilize both dedicated HFR tracks with passenger priority and host railway controlled and dispatched tracks. Dedicated tracks refer to sections of the alignment where passenger and freight traffic is controlled and dispatched by the HFR operator with passenger priority, whereas host railway tracks are controlled and dispatched by the host railways. The majority of the overall HFR alignment operates on HFR dedicated tracks controlled and dispatched by the HFR operator with passenger priority.

[REDACTED]

[REDACTED] The breakdown of HFR and host railway controlled track is outlined by the table below detailing the HFR dispatch and control percentages of the alignment.

³⁹ The Siemens MSA Contract section 2.4.1.0.1 notes that Diesel Motive power *shall be sufficient traction for a AW2 loaded trainset for speeds up to 110mph*. This limits vehicle performance when in Diesel Mode.

Table 38 Length of alignment dispatched by HFR and Host Railways



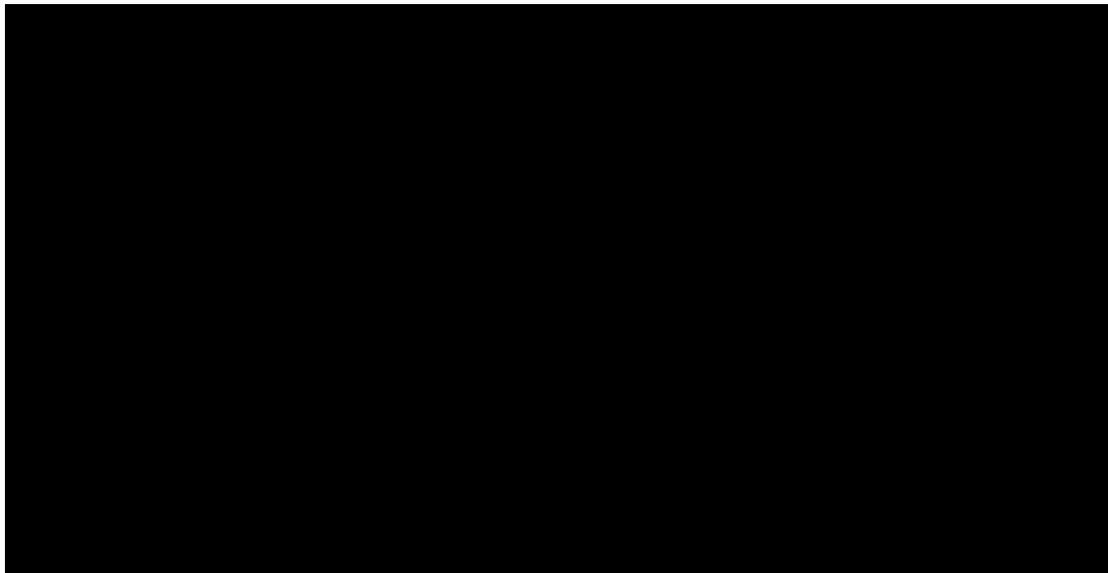
The HFR intercity alignment follows existing freight right-of-way. CP has stated that access to their freight customers must be maintained for CP and QGRY and HFR must ensure that there are no impacts to freight operations. Therefore, additional capital costs for reconfiguring track works, which includes crossovers and realignment of CP tracks have been included to mitigate the risk at these locations for host railways. To ensure seamless integration of HFR into the broader network, further discussions with host railways are required to confirm operational requirements and dispatching agreements in the third-party owned ROW.

Toronto – Ottawa – Montréal

The Toronto-Ottawa-Montréal section (Figure 59) principally uses the



With this alignment, it is currently envisaged that:



⁴⁰ The current assumption is that HFR will have dedicated tracks along



- Grade separated solutions are required at key locations (e.g. Agincourt Yard and the Winchester Sub at Dorion) to reduce complex operational interfaces between existing freight traffic and HFR.

The Toronto – Ottawa – Montréal section would currently require the rehabilitation and upgrade of existing tracks, together with the construction of new track along abandoned and active rail ROW. Along the section are several customers served by freight operators, the greatest number of them are along the Havelock Sub, at Peterborough, and along the Winchester Sub. To mitigate against interface risk between freight customers, HFR passenger operations, and host railways' freight operations, additional cost allowances have been included in the cost estimate. Further discussions with host railways and customers are ongoing to de-risk these interface points with operational solutions. This alignment enables direct services between Toronto and Ottawa and between Toronto and Montréal. Current rough order of magnitude estimates⁴¹ for infrastructure for this section, inclusive of all infrastructure, electrification, land acquisition, city accesses and host railway costs range between [REDACTED] and [REDACTED].

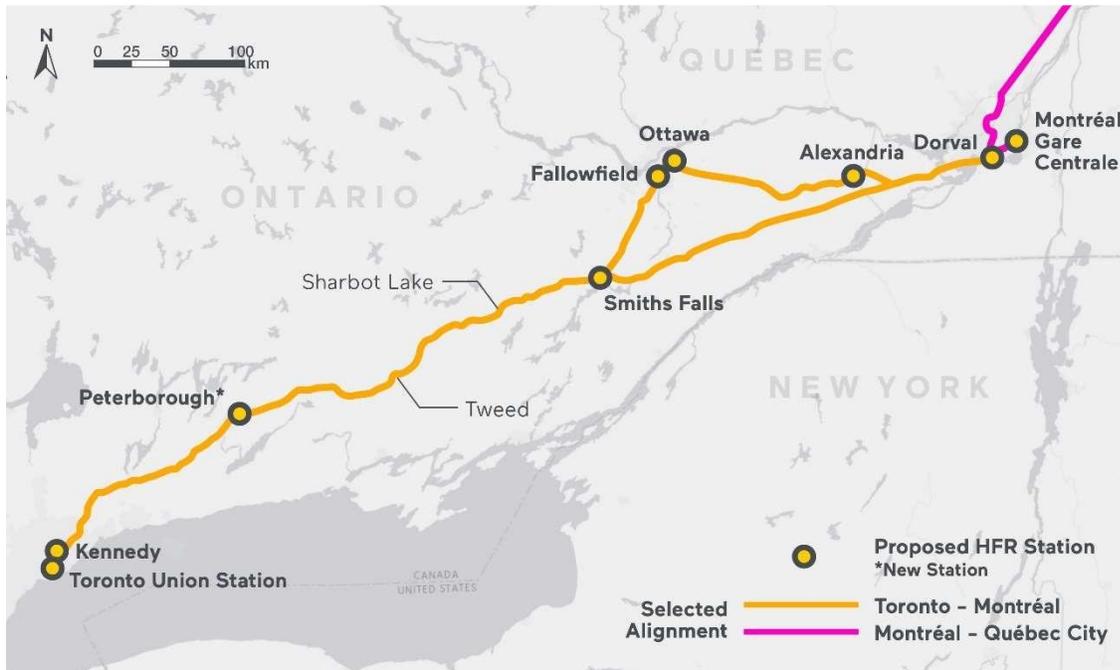


Figure 59: Toronto - Ottawa - Montréal alignment and stations

⁴¹ Costs are presented as total project costs within a -25%/+40% range based on rough order of magnitude (Class 5) estimates, consistent with AACEi standard. Details are provided in Section 9.1.

Montréal – Québec City

The Montréal and Québec City section (Figure 60) follows the active QGRY freight ROW, through Trois-Rivières, on the north side of the St. Lawrence River.

It is currently envisaged that:

- The HFR operator will control and dispatch all of the alignment (except for the CN Quebec City Access segment) and in effect provide trackage rights to QGRY and through them to CP pursuant to agreed train schedules.
- The corridor would be a mixture of lengths of single track and double track that would provide sufficient capacity to operate the proposed HFR timetable (to Service Level 3).
- In several locations, tracks will be reconfigured to improve the safety of the HFR services and to reduce conflicts with freight traffic. This may result in grade separation or re-configured crossings where HFR has passenger priority over QGRY and CP freight traffic.
- Five major structures (i.e., existing rail bridges) will need to be reconstructed or rehabilitated to meet HFR requirements.

⁴² Costs are presented as total project costs within a -25%/+40% range based on rough order of magnitude (Class 5) estimates, consistent with AACEi standard. Details are provided in Section 9.1.

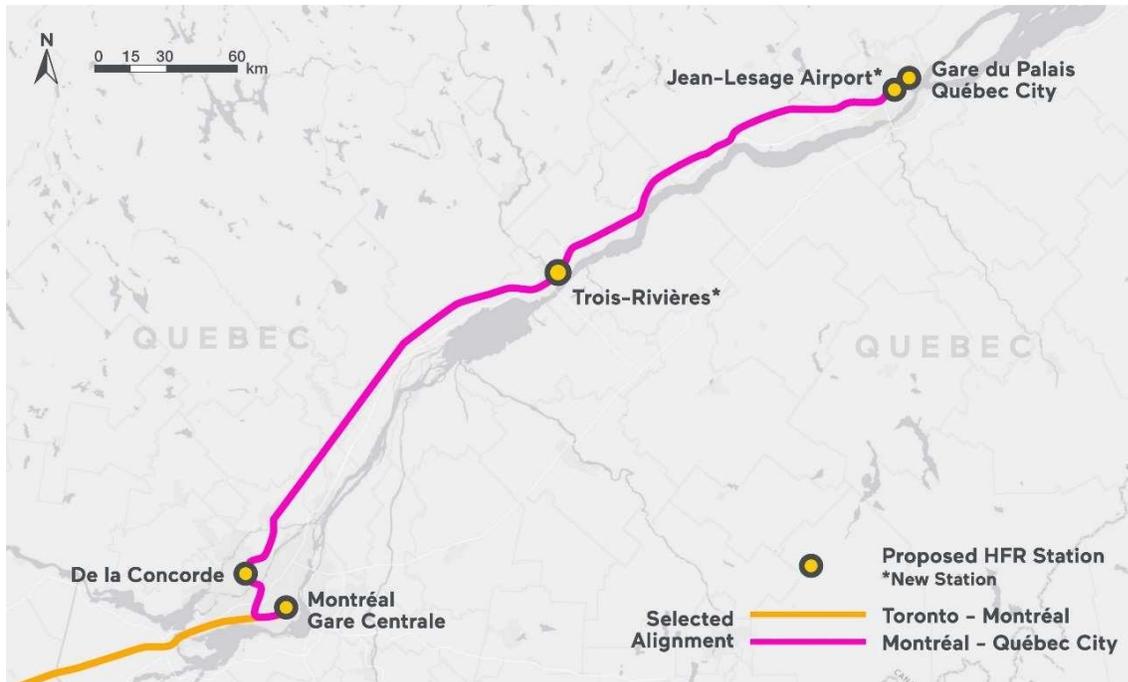


Figure 60: Montréal - Québec City alignment and stations

Further details on the currently proposed alignment are discussed in the *Alignment Report* issued [April 2021]. At this time, the alignment should be considered preliminary and hence will be subject to future modifications to ensure that it fully aligns with the overall project objectives. Further due diligence and design development, including discussions with host railways, is required to validate assumptions in project scope details.

10.1.3. Stations

HFR is currently planned to serve a total of thirteen stations between Toronto and Québec City, which were shown in Figure 59 and Figure 60. There are currently eleven stations between Toronto and Québec City that require improvements to meet the anticipated operational requirements of HFR and two new stations. The rehabilitated stations currently include Toronto, Kennedy, Smiths Falls, Fallowfield, Ottawa, Alexandria, Dorval, Gare Centrale, De La Concorde, Trois-Rivières, and Québec City. The new stations are Peterborough and Jean Lesage. The following existing stations have a low likelihood of major impacts resulting from HFR: Ottawa and Alexandria. The rough order-of-magnitude⁴³ capital costs associated with HFR stations range between \$215 million and \$402 million. Further details on the station assessment are outlined in the [REDACTED]

⁴³ Costs are presented as total project costs as a -25%/+40% range based on rough order of magnitude (Level 5) estimates, consistent with AACEi standard.

Level boarding where the platform and vehicle floor are at the same height would enable step-free access at the stations. This is important to ensure seamless and safe onboarding and offboarding of passengers, allows for greater accessibility and improves on-time performance.

The current reference vehicle (Siemens Charger) presents considerations at some key stations, in terms of train to platform interface. HFR requirements for level boarding for the station platforms are at 49 inches due to the use of the current reference vehicle. [REDACTED]

[REDACTED] Having platforms lower than 49 inches will require longer dwell times to accommodate boarding and alighting of passengers. Further due diligence and design work are required to explore options to enable both level boarding and interoperability with other rail services.

Dorval Hub

The JPO conducted a separate study to develop the existing Dorval station into an integrated transport hub with connections to Montréal Airport, Réseau Express Métropolitain (REM), and local bus services. This study explored a range of concepts and proposed solutions. The costs for an intermodal hub station are excluded from the current capital cost estimate for HFR. Further details are included in the *Dorval Hub Link Interconnectivity Study* report.

10.1.4. Road / Rail at-grade Crossings

There are a total of 1,148 road / rail at-grade crossings along the alignment. The total number of crossings is summarized by section in Table 39.

Table 39: Number of rail crossings by segment and type

Crossing Type	Toronto-Ottawa- Montréal	Montréal-Québec City	Total
Public	319	108	427
Private	313	408	721
Total	632	516	1148

Currently, the majority of roads cross the rail corridor at-grade (i.e., the road and rail are at the same level). With at-grade crossings there remains the risk of accidents between rail and road users. Current Transport Canada regulations for at-grade crossings limit maximum train operating speeds to 177 kph (110 mph) while traversing these crossings. Current journey times are based on a maximum operating speed of 177 kph (110 mph).

Of the 1148 total crossings, 427 are public crossings of major or minor roads. The current project costs assume that all public crossings will be upgraded with a full grade crossing warning system with lights, bell, and gates. Current rough order-of-magnitude⁴⁴ capital costs for

⁴⁴ Costs are presented as total project costs as a -25%/+40% range based on rough order of magnitude (Level 5) estimates, consistent with AACEi standard.

crossings range between \$131 million and \$244 million for the upgrade of crossings. All crossings will undergo safety and risk analysis, along with any regulatory compliance requirements. Given the high number of crossings, the JPO may consider combining adjacent crossings where reasonably practicable to reduce the total number of crossings.

A full safety and risk analysis will be required to identify at-grade crossings that may need to be eliminated (i.e., through the closure of the crossing or the construction of a road bridge over the tracks), and those which may be managed through interventions such as warning systems and gates. Grade separations, or other safety improvements, may be recommended, taking into consideration benefits to safety, train journey times, train speeds, increased train frequencies, local traffic impacts, electrification, capital investment, and operational requirements. The JPO has, at a high-level, explored the costs and benefits associated with grade separations through the optimization exercise.

10.2. Technology

Rolling stock, electrification, and signalling, and train control are key elements that are instrumental in meeting the desired vision and objectives for the HFR project. They need to be developed and specified in conjunction with all passenger facilities and the project infrastructure to achieve a complete and integrated system and network. The current progress for defining technology requirements for HFR is detailed in the following sub-sections.

10.2.1. Electrification

As part of its overall mandate, the JPO assessed the HFR project under two technology options, electric and diesel. Based on guidance from DMOC, electrification is the preferred technology option. Electrification brings environmental benefits including reduced greenhouse gas, particulate matter, and nitrogen oxides emissions at the train source. This section discusses the technical feasibility of delivering the HFR project with electrification.

Electrification requires additional infrastructure including supply and distribution facilities to convert electric power to a usable voltage for the overhead catenary system that powers the electric trains.

At this stage of the project, it is assessed that up to 93% of the alignment will be electrified.

This will require the HFR trains to be able to operate in bi-mode (electric plus an alternative power source).

HFR requirements document and presentations to CP include electrification on all CP's ROW and Tracks. CP has indicated concerns regarding electrification within their ROW as they believe it could impact their current and future operations. Further work is required to understand CP's specific concerns related to electrification and assessed through a Safety Case and Interoperability Assessment. Continued dialogue with CP are required to determine the feasibility of electrifying HFR infrastructure in the CP right-of-way.

The primary delivery considerations for electrification of the HFR alignment include:

- third-party coordination with utilities and freight rail operators who own the ROW;
- potential considerations with host railway access and interoperability
 - Safety
 - Potential electromagnetic interference – Train operation & signalling
 - Maintenance process Safety
 - Infrastructure immunisation – Grounding and bounding
- regulatory requirements; and,
- timelines for electrical utility and power supply capacity coordination.

Further details regarding the electrification of the alignment are presented in the *Alignment Report* issued in April 2021.

10.2.2. Rolling Stock Considerations

Overall HFR Project parameters and requirements are yet to be defined and set for the project, although guidance from DMOC has suggested that electrification is preferred as the primary traction technology. Studies and assessments to date have utilized the rolling stock procured through VIA Rail's Corridor Fleet Replacement Program as a reference rolling stock for the purposes of modelling.

The observations and findings of the reports which followed the April 2021 Project Status Update, in particular, the outputs from tactical optimization studies, identified that alternative reference rolling stock may present opportunities to reduce operating costs through lower HFR frequencies by providing additional seating capacity to serve the projected ridership growth.

It is recommended that a Rolling Stock Concept Study be launched in the next phase of the project, which would include the development of a complete and informed strategy covering such topics below.

The Reference Rolling Stock

The reference rolling stock (Siemens Charger) consists of a single diesel-powered locomotive and six coaches and a cab car (a combination of seating accommodation and a driving cab) each with a single customer access door per car side. The internal layout has been designed to improve the current customer experience and provides individual galley catering facilities in each vehicle.

The reference rolling stock has a passenger carrying capacity of 409 and capable of operating at a mix of platform heights (e.g., 5, 25, and 49 inches) currently encountered on the Local Services, through deployment of powered and fixed steps.

Each train has an available train length for passengers and amenities of 157m, which consists of the following amenities:

4 wheelchair zones	5 accessible sanitary units
4 standard sanitary units	7 luggage stacks per train
5 distributed galleys	6 electric cupboards per train

The total seating capacity of each train is 409 passengers, divided into the following classes: which comprises of

- 87 Business Class seat, with a seat pitch of 97cm; and
- 322 Standard class seats with a seat pitch 92cm.

The reference rolling stock has maximum permitted speed in diesel mode of 110 mph.

[REDACTED] This will require additional testing and approvals.

Traction Power Technology: The Reference Rolling Stock locomotive used for modelling purposes (Siemens Charger) is a diesel locomotive for which the supplier has provided a concept design and retrofit process which may accommodate the technical and operational requirements for electrification as a secondary means of propulsion.

The diesel engine could still be utilized in parts of the route where electrification is not present.

The JPO has been unable to assess the impact this electrically hauled option has on operating parameters. Therefore, all current work assumes the known characteristics presented by the current diesel operated solution.

A Rolling Stock Concept Study would cover such matters, including assessment of Alternative Reference Rolling Stock that is designed predominantly for electrification technology and capable of operating in bi-mode (for non-electrified sections of the route). Electric rolling stock are lighter and have better acceleration performance, capable of higher speed, and promotes environmental benefits compared with diesel-powered locomotives.

Pending the outcome of ongoing negotiations concerning electrification interoperability with Host Party Railway authorities, as well as the parameters for electrification of dedicated lines, an electrified rolling stock with bi-mode (battery or smaller diesel alternative power) capabilities may be required.

The need for an optimized rolling stock based on HFR passenger requirements:

Passenger carrying capacity over the operating life: Annual ridership for the HFR project is expected to be 8.7M and 16.8M for operating years 2030 and 2059 respectively; this represents a 93% increase in ridership in the 30th year of operation versus the 1st year. This expected increase in ridership is met with the provision of seats that is currently available in the Reference Rolling Stock, as used in analysis and modeling to date. The Reference Rolling Stock utilizes approximately 51% of its length for seated passengers. Intercity rolling stock typically use between 53 and 68% of rolling stock length for passenger seats with remaining space allocated to on-board facilities.

Operating Speeds and acceleration performance: The Siemens Charger is designed for operating speeds up to [REDACTED] in diesel mode, and up to [REDACTED] in electric mode (with the EPC conversion)⁴⁵.

Modelling and analysis has assessed acceleration performance at low and higher speeds. The modelling was based on a five (5) car, one locomotive set (base case requires seven (7) car, one locomotive). At lower speeds the Reference Rolling Stock requires approximately 5 min to accelerate from 45 mph to 110 mph over a distance of 11 kilometres. At higher speeds the reference rolling stock requires approximately 6 minutes. to accelerate from 110 mph to 125 mph over a distance of 20 kilometres.

Alternative Rolling Stock: As part of the Optimization exercise, a desktop study was undertaken through sampling a variety of alternative fleets options for HFR. Focus was put on alternate fleets with greater capacity configurations that would enable the capture of the demand with less frequencies over a 30-year period. Alternative rolling stock may present opportunities to reduce operating costs, improve journey times through improved operating performance, reduce frequencies through accommodating more passengers and optimize station dwell time.

Any alternative rolling stock selected would be required to meet HFR customer expectations, corridor-wide environmental considerations (e.g. winterization and anticipated requirements related to environmental impact assessments), regulatory approach, including crashworthiness and accessibility requirements.

Rolling stock procurement approaches

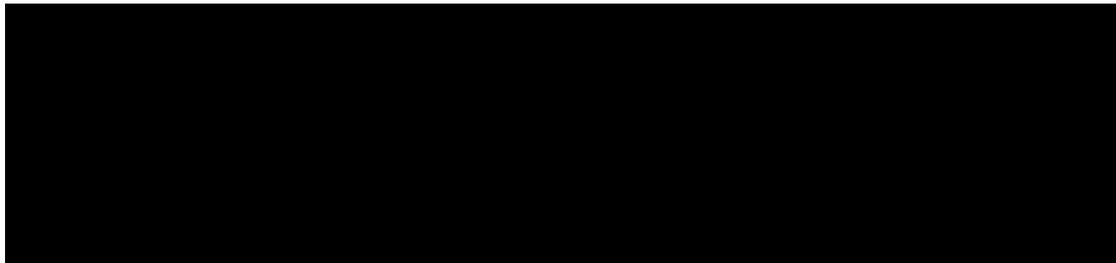
The JPO identified options for the procurement of the HFR rolling stock. The strategy for rolling stock procurement could be considered independently from the overall procurement model selected or could be delivered as part of a DBFM or DBFOM model. Alternatives exist for the Government of Canada to procure rolling stock or enable a potential Private Partner to offer rolling stock that meets the objectives of the project. The strategy is also affected by the definition of requirements for the HFR project, for example, intercity operating speeds for attractive journey times, use of dedicated passenger corridors versus using shared corridors or whether the route is completely, partly, or not electrified.

⁴⁵ Siemens MSA Contract (Section 2.4.1)

10.2.3. Signaling and train control

Signalling systems control the movement of trains within the network and support the safe and optimal operations. The JPO conducted a preliminary evaluation of mature signalling technologies considering operational safety, interoperability, scalability, and growth, and rolling stock compatibility. Through this assessment, a solution based on European Train Control System (ETCS) that accommodates regulatory needs, set out by the Railway Association of Canada, and is compatible with the future Canadian signalling strategy is recommended for the HFR reference concept design. This system is being considered as it is safe, allows for optimal operations, and uses a non-proprietary technology that has been proven globally for over two decades (i.e., used on new and upgraded intercity globally). It is interoperable with other rail signalling systems, and can be tailored and scaled depending on track ownership and any existing controls. Modern signalling and train control systems, such as ETCS, require less physical wayside infrastructure across the route alignment which is a resiliency and maintenance advantage.

The Rail Association of Canada (RAC) is working with Transport Canada to define future Enhanced Train Control functionality requirements across Canada. HFR base functionality will be Automatic Train Protection (ATP), which is a safety critical function that overrides human error, such as operating trains over the track speed limits and passing red signals. On host railway networks, where HFR trains must communicate with the host railway signalling systems, currently CN and Metrolinx networks, there are three options:



Further details on the recommended approach for railway systems are outlined in the *Alignment Report*.

10.2.4. Safety Assurance Process

The current legislative framework, safety rules and standards are focused to provide safety assurance, minimize risk and provide a system oversight for operational railways, with mature, defined technologies and known working practices, to minimise risk to passengers, operators, adjacent property owners and the public.

The construction and operation of HFR will introduce technology not currently in use on the Canadian network, to enable the potential for higher speed passenger train operation, above 110 mph but less than 125 mph and change current operational working practices. Each of these areas require consideration of how safety assurance of the products, services or procedures can be introduced safely onto the Canadian rail network.

The safety assurance process will cover all the lifecycle of the project, and address the following considerations:

- Systems designed to appropriate standards;
- Risk assessment (measurement) and mitigation;
- Third-party stakeholder / host railway engagement;
- Construction acceptance and standards verification;
- Systems integration, commissioning, and testing;
- Regulatory framework and rules governing the operation of the system; and
- Training and competence management system for railway operations.

A Safety Case framework is recommended that provides an outline of activities throughout the project lifecycle and where stakeholders are to be engaged.

10.3. Project Delivery

The JPO has initiated the planning of activities to support the overall delivery of the project including consideration of the Impact Assessment, land acquisition, host railway access rights, project timeline, and consultation. These activities require further definition with consideration on the impacts to project schedule. The following subsections summarize the work completed to date and the next steps to advance the project towards delivery.

10.3.1. Impact Assessment

The JPO confirms that, based on the current design, the Project consists of an alignment that exceeds 50 km of New ROW as defined in the *Physical Activities Regulations*, triggering the requirement to enter the Impact Assessment Process. Once an alignment is optimized, the Project will submit an Initial Project Description (IPD) report and a Detailed Project Description (DPD) report after which the Impact Assessment Agency of Canada (IAAC) will determine the requirements for an Impact Assessment (IA). It is predicted that IAAC will identify the need for an Impact Assessment under the *Impact Assessment Act* (Act).

The JPO, as the representative of the proponent, is currently in the Pre-planning Phase as a precursor to the IAAC's Planning Phase. IAAC has identified their objectives for the JPO for the Pre-planning Phase and the Planning phase to set the IA up for success. This requires the JPO to:

1. Provide facts and information on the Project that that will help IAAC to "size and scope" the project properly for the IPD;
2. Undertake Indigenous and public consultation;
3. Complete this preliminary work to help prepare IAAC for their upcoming Planning Phase;
4. Work with IAAC to complete the Summary of Issues for the IAAC Planning Phase including proposed mitigations;

5. Help IAAC to optimize their Tailored Impact Statement Guidelines (TISGs) which are the output of the Planning Phase.

To this end, the JPO and IAAC have completed workshops on:

- Greenhouse gas definitions, methodology, calculations, and indicative reduction results;
- Communications plan and strategy for Indigenous Consultation and Public Consultation (requested by IAAC);
- IAAC-led public consultation and IA process planning;
- Electrification and ROW snapshot with all infrastructure (including traction power substations) and order of magnitude information on such equipment and distances;
- Alignment reviews with all major works and activities and existing and planned structures with information on rehabilitation versus new construction and minor versus major impacts;
- Capacity building with the Federal Review Team (FRT), including defining the composition of Federal Review Team and initial briefing sessions;
- JPO and IAAC expectations for provincial engagement in a federal interprovincial transportation project;
- Cooperation Agreements with the provinces;
- Information sessions on HFR with Ontario and Québec environmental representatives to understand their powers and requirements with respect to environmental assessment.

The current status of the provincial powers is as follows:

- Quebec has asked the JPO to examine if the Quebec Act is triggered (it most likely is), while acknowledging that HFR is a Federal Project, but not the division of powers. [REDACTED]

- Ontario has confirmed that there will not be an Individual Environmental Assessment, however, are focused on the need to scope out Class Environmental Assessments (these are regulatory processes that a third party would comply with: municipalities, host railway or Hydro One). [REDACTED]

IAAC will enter into a Cooperation Plan that will define common obligations, address scope overlap, identify the lead agency responsible, and next steps for the JPO.

The output will determine the scope of the IA. Key elements IAAC will consider include:

- Scope – the elements of the project that are included in or excluded from the assessment (e.g. VIA local routes, Targeted Investments, Dorval Intermodal Hub);
- Impact – identifying the elements of the project that are existing infrastructure or new infrastructure; and
- Alternatives – alternative means of delivering the project and alternative technologies that were considered.

All of these workshops are with a view to defining the scope and finalizing the IPD to be shared with IAAC for completeness as per the requirements of the Act and then filed on its website.

In recognition that the project is considering procurement under a DBFM or DBFOM public private partnership, the JPO will share non-alignment specific chapters of the IPD that remain neutral irrespective of whatever innovation or optimization a private proponent will bring. IAAC has advised they will consider multiple alignments, and accept that alignment-specific sections, and work done to date on alternatives, would be presented to the market as a “Reference Concept Design”.

Additional work that the JPO will progress to support the completion of the IPD and DPD includes:

- Updating of legal advice and memos on the applicability of the Act, provincial environmental regimes, and the Strategic Assessment of Climate Change;
- Review of the Permit Register with IAAC to confirm requirements and finalize down to the local/municipal level once final alignment and optimization is known; and
- Review of the Environmental Regulatory Inventory with IAAC to validate requirements.

The JPO will initiate the formal IA process by filing an IPD. IAAC has advised that it requires two months to review the draft IPD and to share the document with Environment and Climate Change Canada and the FRT. The IA is projected to occur over 3 to 5 years, depending upon the field study requirements and any objections to the project or identification of adverse effects that cannot be mitigated or offset by the positive effects.

Early desktop assessment, discussed further in the *Alignment Report* issued in April 2021, identified medium risk impacts and zero high risk impacts to environmental, social, schedule and cost factors. Further desktop assessment and initial field verification of the selected alignment were conducted to de-risk environmental concerns in specific locations and provide data for the IPD, Study Plans, and Work Plans.

10.3.2. Land Acquisition

Land acquisition will be required to enable the HFR project. This section outlines the strategy to acquire private and commercial land for the Project [REDACTED]

[REDACTED] The JPO performed a high-level analysis of land parcel requirements where a certain level of control (e.g., ownership, permanent easement, temporary/work-related access) is required for the selected alignment.

Table 40: Preliminary estimates of land parcel requirements

Section	Number of parcels excluding multi-use trail	Number of Multi-use trail parcels	Total Land Parcels
Toronto – Ottawa – Montréal	1299 parcels	99 parcels	1398 parcels
Montréal – Québec City	326 parcels	0 parcels	326 parcels
Total	1625 parcels	99 parcels	1724 parcels

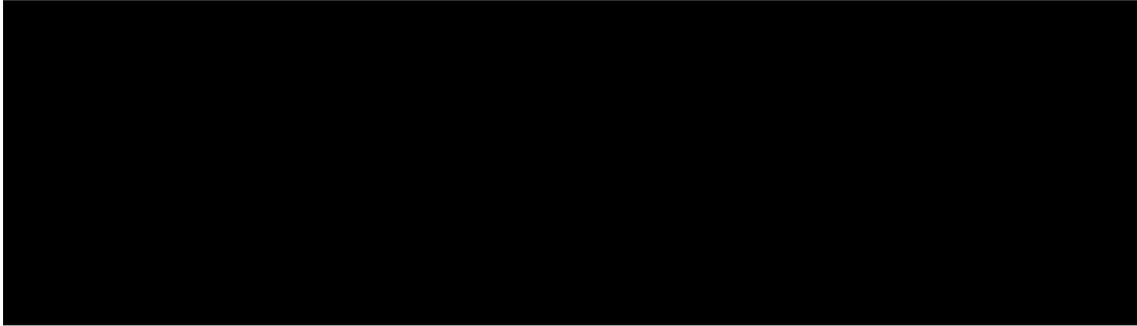
[REDACTED]

A desktop valuation exercise was conducted in relation to the selected alignment, based on available assessment and sales data for land. In 2021, additional lands were identified to be necessary, the revised estimated market value range is \$585M to \$1,092M to acquire approximately 53,000 acres (excluding multi-use trail lands)⁴⁶. This estimate includes whole parcels except for a few large, expensive pieces of property where only a small portion is required.

Parcels could be acquired in whole or in part, and unused portions of parcels would also be resold once no longer required. The JPO will continue to refine this estimate reflecting further due diligence activities.

The JPO is finalizing a high-level land acquisition framework and strategy for the project. However, the JPO expects to adapt the framework and strategy as new information is made available throughout the land acquisition process. The key principles of this framework are based on international best practices identified by JPO and its advisors. [REDACTED]

⁴⁶ The valuation is extrapolated from the JPO's initial estimate using a 2020 market study which identified a market value of \$235M to \$322M to acquire approximately 24,800 acres of land.



As an approach to de-risk the delivery of the project under the PPP procurement model, the Government of Canada should consider it will always own title in the land acquired and retain risk. Public sector ownership of the project lands ensures it is applied to the HFR Project as required by the Government of Canada.

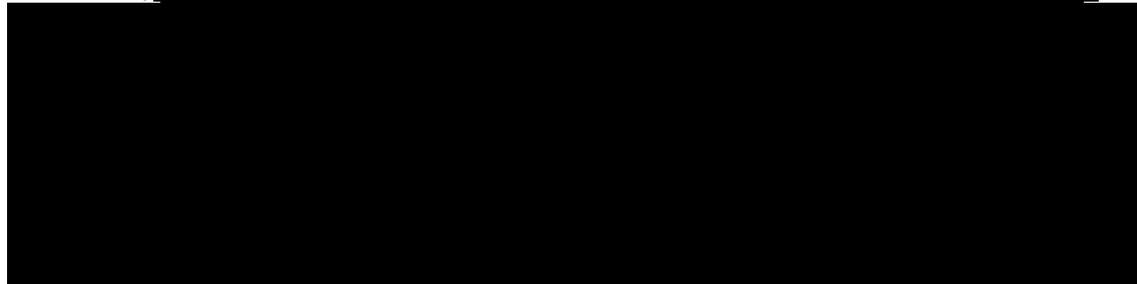
The JPO has explored special mechanisms that could be available to the government to accelerate the HFR Land Acquisition process. The JPO can explore these mechanisms further should the Government of Canada confirm that such special mechanisms are of interest to facilitate HFR project deployment.

The JPO will continue to conduct due diligence activities to support land acquisition, including:

- Refining land requirements including non-rail related land required for the project;
- Perform title searches;
- Identify the appropriate entity to proceed with land acquisition and ownership;
- Develop detailed land acquisition framework and strategy;
- Confirm valuation methodology for negotiation appraisals; and
- Conduct surveying of lands and negotiation appraisals.

10.3.3. Host Railway Access Rights

All City Access proposals currently include the requirement to use host railway track infrastructure (i.e., Metrolinx for Toronto and CN, CDPQ and CP for Montréal), as well as the use of host railway right-of-way between Toronto and Montréal [REDACTED] and Montréal and Québec City [REDACTED]



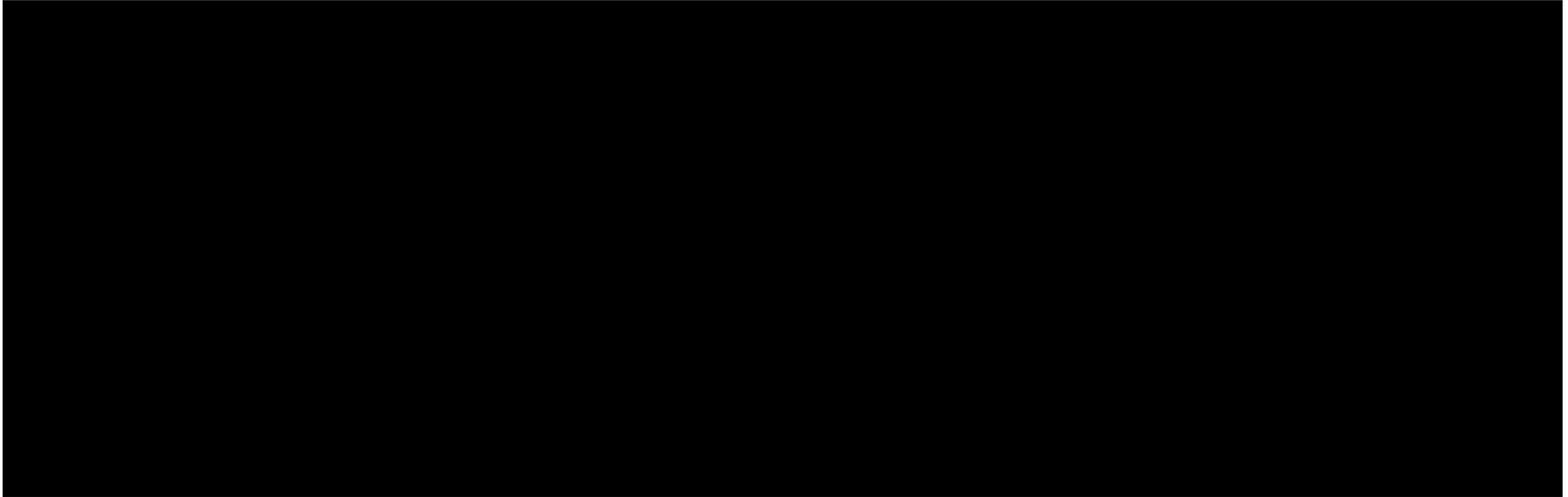
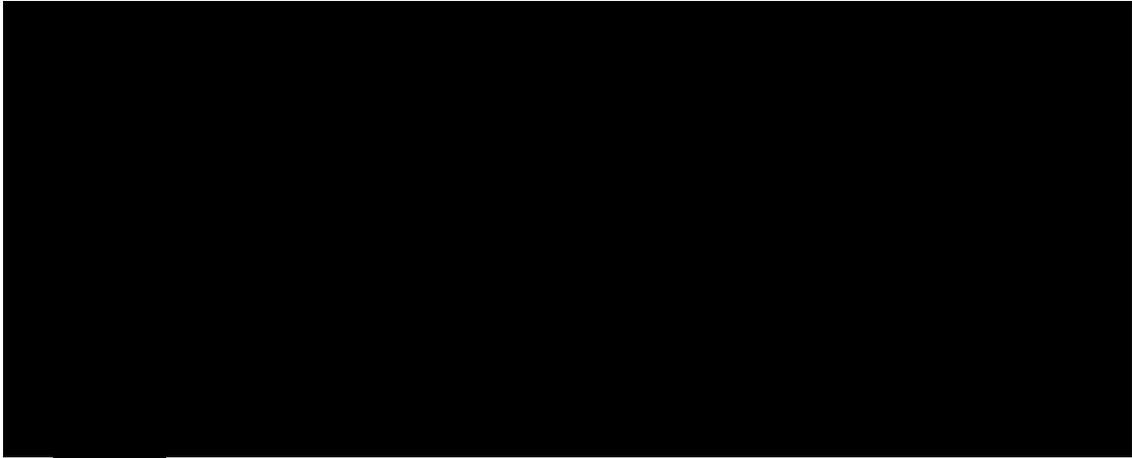


Figure 61: HFR / Host Railway Control across the alignment



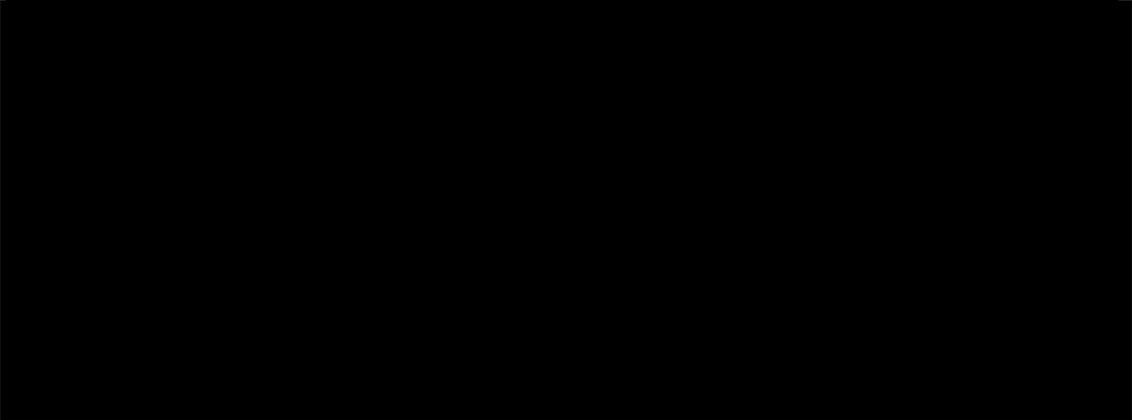
HFR owned track in host-railway owned or leased ROW, e.g, intercity CP and QGRY.

In addition, the JPO has presented options to TC for regulated access to support or complement the above that exist under the current Canada Transportation Act (CTA) as well as a range of improved and ambitious oversight models, with reference to previous successful regulatory initiatives in Canada (the Grain Decree).

Existing Commercial Agreements

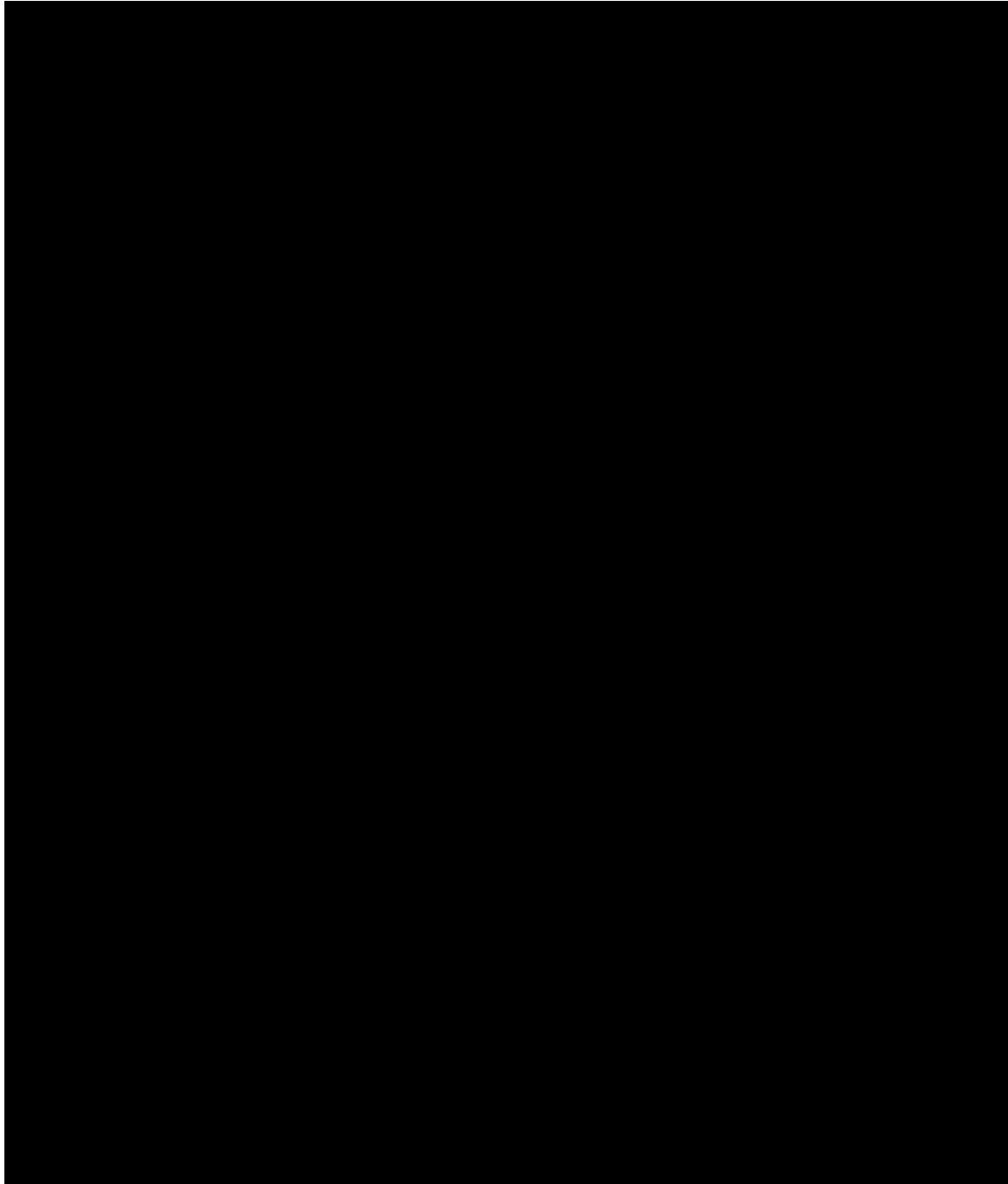
VIA Rail presently has in place Train Service Agreements (TSAs) providing for host railways to provide dispatching and access on shared infrastructure in host railway-owned ROW for a fee. VIA negotiates infrastructure development as required for capacity improvements and rehabilitation through bespoke commercial arrangements (VIA's Rehabilitation and Improvements Agreement with CN has expired).

Within Canada, currently, 97% of VIA's operations are on host railway infrastructure,



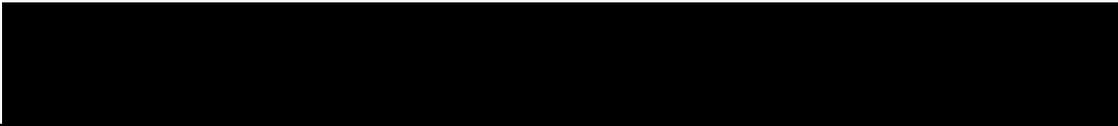
Within the 3% of VIA's operations on VIA-owned infrastructure and ROW (all within the Quebec City-Windsor Corridor), VIA has outsourced the operations in terms of dispatching, maintenance, and the Virtual Traffic Control System (VIA IP) to Railterm since 1999. Railterm was recently acquired by Siemens.

Progress on Commercial Terms with Host Railways

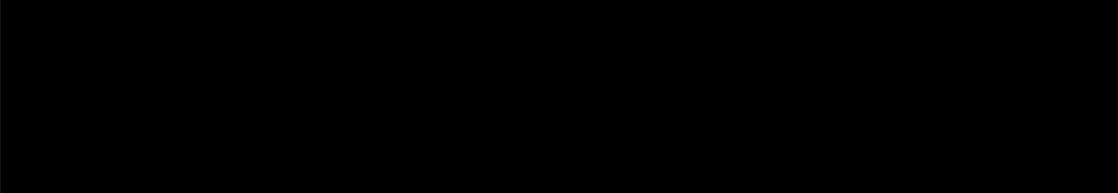




Private Operator Licensing



The process for applying for a certificate of fitness is straightforward and is outlined in the Canadian Transportation Act.



10.3.4. Project Schedule

At a high-level, the JPO has identified a strategy to develop the project to market. The preparation of the Reference Concept Design, public consultation, land acquisition, and the Contract/RFQ/RFP documentation would occur in parallel to the undertaking of the Impact Assessment.

The HFR project will likely require 8.5 - 13 years for Impact Assessment (IA), procurement, design, and construction. The timing of the project is largely driven by the duration of the IA, ranging between 3-5 years, as outlined by the indicative conservative and optimistic timings in Figure 62.

The Procurement In Market phase includes 11-12 months for bidders to prepare technical and financial submissions and 4-6 months for the evaluation and contract award. This phase is subject to reconsideration as the Government of Canada considers a Procurement approach to identify and partner with one or more Private Development Partners. The Partners would participate in a "Project Development Phase" prior to final design selection.

An optimistic four-year Construction period requires multiple work fronts to deliver the project. The schedule is driven by the number of possible work fronts and resources employed. This schedule will need to be re-assessed and revised once the current project assumptions have been validated in the next phase of the project.

An allowance has been made for Testing, Commissioning, and Start Up activities. There is potential for optimization of the testing and commissioning activities, if work to advance ETC is undertaken during the next 5 years with TC, RAC, and the industry.

The project timeline has been revised since issuing the Project Status Report in April 2021, to account for the following:

- In the conservative scenario, an additional 12 months have been included prior to the formal commencement of the Impact Assessment process in the event that the Government decides that further public consultation and scheme optimization is required;
- A five year Impact Assessment process has been included in the conservative scenario, four years in the currently assumed scenario, and three years in the optimistic scenario; and
- The duration of the RFP stage has been increased to 18 months.

Risks to the overall schedule include:

- The JPO has commenced the pre-planning phase with IAAC. The timing of the formal start of the Impact Assessment process with IAAC's planning phase will be impacted by a Procurement Approach to be determined;
- Longer Impact Assessment, consultation or land acquisition process caused by public opposition to the project; and
- Site conditions, poor weather, and natural events can lengthen the construction durations if worse than currently assumed. For this reason, if the Revenue Start Date falls in winter, then consideration should be given to delaying the opening date to spring so as to ensure that all winter testing is completed in advance of opening.

Mitigations to schedule timing include:

- Procuring early topographical, bathymetric, structural clearance surveys, ground investigations data, hydrology studies, traffic surveys, etc. will help to secure the date the RFP is released to the market. This is in progress by the JPO.
- Early works could be considered after the decision statement is obtained if seasonal constraints for activities such as tree clearance would delay the start of construction.

A more detailed project schedule will be developed in future design phases to validate project assumptions.

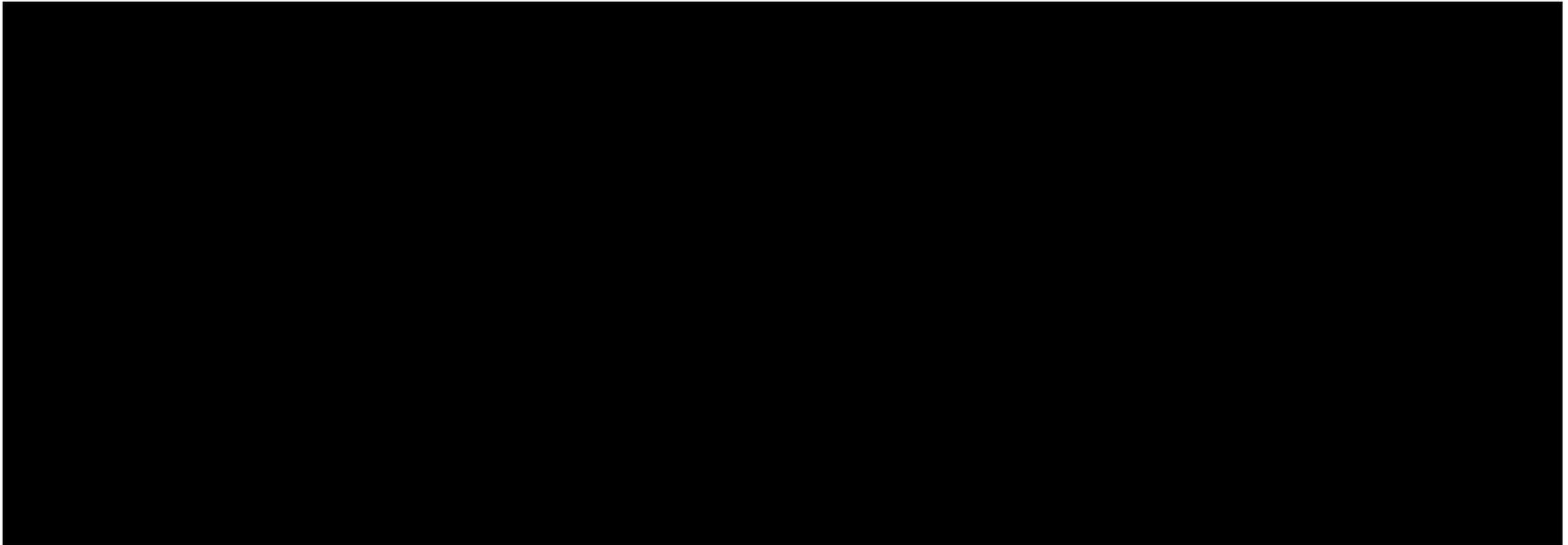
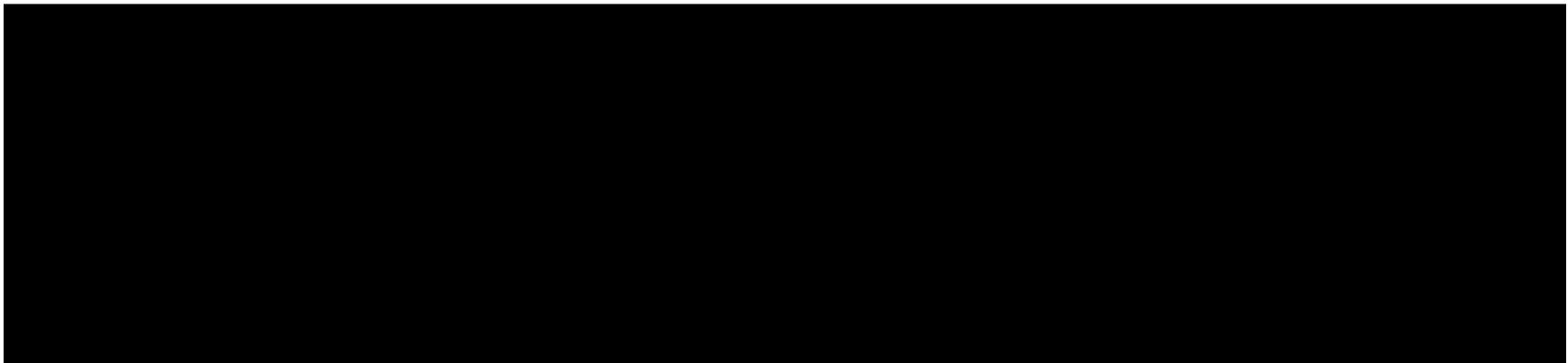


Figure 62: indicative conservative / optimistic project timeline



10.3.5. Public and Stakeholder Engagement and Indigenous Consultation Overview

VIA Rail proactively started engagement activities in 2015.

The JPO conducted additional detailed desktop research to enhance the engagement and consultation process in 2020 and developed the integrated communications and public and stakeholder engagement plans, narratives, scripts, question and answer, and briefing notes for engagement. The HFR website based on these materials is now live at www.tgf-hfr.ca/hfr. It provides a toll-free number and an email address and is a tool to support public consultation and collect feedback, capture data, and provide reports to IAAC.

The JPO conducted workshops with IAAC across the summer of 2021 on consultation to understand the Agency's requirements, to finalize the stakeholder lists and to validate the list of affected Indigenous Groups. The JPO also conducted pre-planning consultation with Indigenous Groups, stakeholders, and the general public to solicit their feedback on the effects of the project. Meetings with representatives from Toronto, Sharbot Lake/Frontenac County, Montreal and Trois Rivières were held.

The consultation with the public and Indigenous communities were put on hold on August 12, 2021, to follow the federal government Caretaker Convention, and will be resumed shortly with stakeholders from Peterborough, Ottawa, Montreal and Québec City. Plans for future public and stakeholder engagement, and Indigenous Consultation are discussed in the following sections.

10.3.6. Public and Stakeholder Engagement

The JPO, representing the proponent during this phase of the project, is charged with discharging the Crown's duty to consult and the requirement to consult the public on the effects of the project and solicit their feedback to be shared with IAAC. The JPO's overall approach for Phase 2 public and stakeholder engagement includes:

- Re-introduce or introduce the HFR project to key stakeholders in Ontario and Quebec.
- Planning community focus groups, including non-governmental organizations (NGOs), environmental non-governmental organizations (ENGOS) and special interest groups identified in concert with IAAC in the fall of 2021. The JPO expects identification of interested groups to be an iterative process: more groups may be identified through the consultation process.

The JPO will continue to meet with other key stakeholders such as host railways, transportation agencies, Federal regulators, and Provincial environmental agencies. In early October 2021, the JPO will follow up with digital focus groups in key city centres, as well as facilitate a new series of focus groups that cover all smaller communities between the key city centres along the proposed route area, as identified in the following table.

Table 41: Communities identified for stakeholder engagement

Ontario	Quebec
[Redacted content]	

When the federal government selects a preferred route, the JPO propose to enter negotiations for land acquisition during Phase 2. Communications with or responses to landowners who may be impacted by the project will focus on the key messages and scope within Phase 2 engagement – with a commitment to continue sharing information as it is available.

10.3.7. Indigenous Consultation

In consideration of the Crown’s Duty to Consult and the anticipated requirements of an Impact Assessment process, 31 Indigenous communities in Ontario and Québec likely to have an interest in the establishment of HFR were identified by the JPO (shown in Table 42). This list will be updated as needed with Indigenous Groups proposed by IAAC and any others who express an interest to be consulted with as the Project progresses.

Table 42: Indigenous Communities Identified for Early Discussions

Ontario	Québec
The Mississaugas First Nations, including: Alderville First Nation; Curve Lake First Nation; Mississaugas of Scugog Island First Nation; Hiawatha First Nation; Mississaugas of the Credit First Nation	Mohawks of Québec: Kanasatake and Kahnawà:ke
The Chippewas First Nations, including Beausoleil First Nation; Chippewas of Georgina Island First Nation; Chippewas of Rama (Mnjikaning) First Nation	The Atikamekw: Wemotaci, Opitciwan, and Manawan, represented by the Atikamekw Sipi Nation Council.;
The Mohawks of the Bay of Quinte; The Mohawks of Akwesasne	Huron-Wendat Nation
The Algonquins of Ontario, and member communities of Pikwakanagan First Nation; Shabot Obaadjiwan (Sharbot Lake); Snimikobi (Ardoch)	The Algonquins of Quebec, including the following represented by the Anishinabeg Nation Tribal Council: Kitigan Zibi, Anishinabeg, Eagle Village-Kipawa (also known as Kebaowek);, Long Point (Winneway), Kitcisakik, Lac Simon, Abitibiwinni (Pikogan), The Algonquins of Quebec including the following represented by the Algonquin Nation Tribal Council Wolf Lake (Hunter’s Point), Timiskaming, Rapid Lake (Barriere Lake or Kitiganik)
Six Nations of the Grand River	Innu People: Pekuakamiulnuatsh Takuhikan (formerly known as Mashteuiasth); Essipit (the Essipinuat); and Pessamit (the Pessamiulnuatsh).
Métis Nation of Ontario	The Abénakis (Waban-Aki) represented by the Grand Council of the Waban-Aki Nation: Wôlinak and Odanak

Introductory Early Discussion

Early discussions with potentially interested and/ or affected Indigenous communities were initiated by the JPO in 2020. The objectives for the early discussions were to:

- Re-open dialogue and introduce the JPO and HFR Project;
- Discuss the communities’ interests and concerns;
- Understand the desired level of engagement and the existence of any community-specific consultation protocols; and,
- Hear from each community with regards to how they are managing and operating through COVID-19.

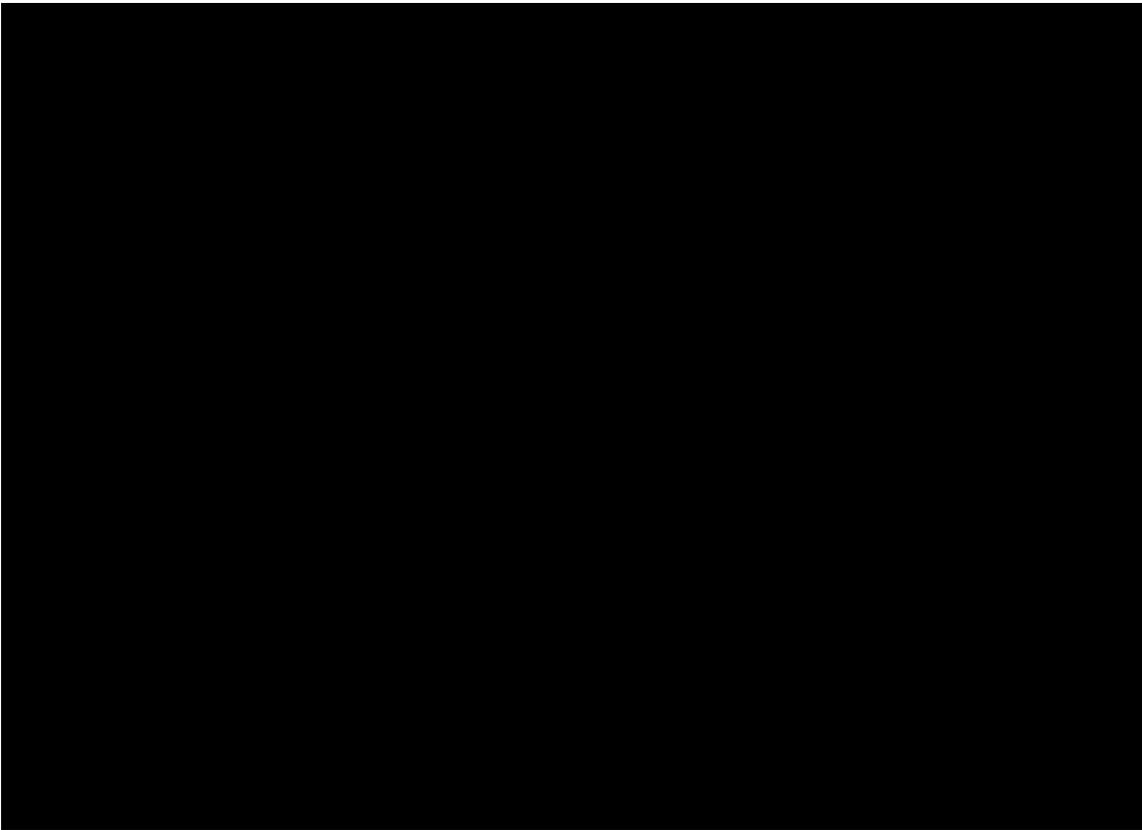
Between September and December 2020, introductory meetings were held virtually with 18 of the 31 interested communities identified.

In advance of initiating early discussions, the JPO completed a desktop review and sensitivity analysis to understand potential interests or concerns, providing a preliminary assessment of potential supporters for the Project and those Indigenous communities who might have concerns. Results from this desktop analysis were used to inform early discussions with Indigenous communities; these early discussions were key to validating and enhancing the preliminary results from the desktop review and analysis.

These results will be verified through ongoing engagement and consultation with Indigenous communities and are subject to change as the Project progresses and new information arises. Of note, and of consideration in assessing feedback and views on the effects, is that while the preferred alignment is not proposed on Reserve Lands, it crosses multiple Treaty, Land Claims, and/or Traditional territories in both Ontario and Québec. Proximity to the alignment also varies between identified Indigenous communities and could influence a community's level of support.

Early discussions with Indigenous communities in both Ontario and Québec were generally positive and productive, with most communities expressing an interest in the Project.

Key comments, insights, and questions raised by Indigenous communities during early discussions include:





IA Pre-Planning

The JPO will continue discussions with Indigenous communities in both Ontario and Québec to support pre-planning for an Impact Assessment (IA).

This outreach will become part of the formal Record of Engagement.

To support these activities the community briefs and community contact information will be updated, letters to each community will be drafted, a presentation will be created (and customized as needed for each community), and the Project Q&A will be updated to address individual community interests. Communication materials will be developed in French and English and presented in plain language. As appropriate, materials may be translated into the traditional languages of the communities to be engaged.

IA Planning

As the Project moves into the IA Planning Phase with the submission of the Initial Project Description (IPD), the JPO will move into formal consultation and engagement with Indigenous communities.

Engagement methods will continue to include meetings, presentations, and discussions, and communication materials will be developed as needed to support this engagement. All outreach during the IA Planning Phase will become part of the record of engagement.

10.4. Operations and Maintenance

The JPO has prepared an initial draft of the Concept of Operations which documents the operations and maintenance requirements for HFR that will guide the next phase of the work (e.g., basis of design, Reference Concept Design, etc.) and be included as part of the Project procurement documents. To date, the JPO has initiated the definition of host railway inputs and requirements for an interface with [REDACTED]. These requirements will be refined following discussions and further input from each railway company.

10.4.1. Right-of-way Maintenance

Remote Maintenance-of-Way facilities to support the maintenance of railway assets will be established at such locations to facilitate efficient dispatching of maintenance crews to perform the required preventative and reactive maintenance. Within the current CAPEX assumptions, there is an allowance to provide a maintenance of way facility every 60km of new track.

10.4.2. Rolling Stock Maintenance

[REDACTED]

The current rolling stock maintenance approach will be confirmed following the completion of a rolling stock strategy, which will help to support decisions on the HFR reference rolling stock, and whether TMC and MMC can serve the HFR operational needs or whether dedicated HFR

facilities are required.

[Redacted text block]

The role of the Private Partner and VIA, and the exact contractual mechanism to provide maintenance services has not yet been determined.

10.4.3. Existing Assets

IA Rail currently is responsible for the maintenance of existing assets owned by VIA in the Corridor consisting of rail infrastructure, stations, and maintenance facilities. VIA manages a number of sub-contracts for the provision of maintenance on its existing infrastructure assets. Throughout the Corridor, the Project will retain these existing assets where they are compatible with the overall project needs. The scale of the existing assets is smaller than the new assets from HFR. A likely breakdown of the HFR and local service (existing assets) annual maintenance costs is summarized in the following figure.

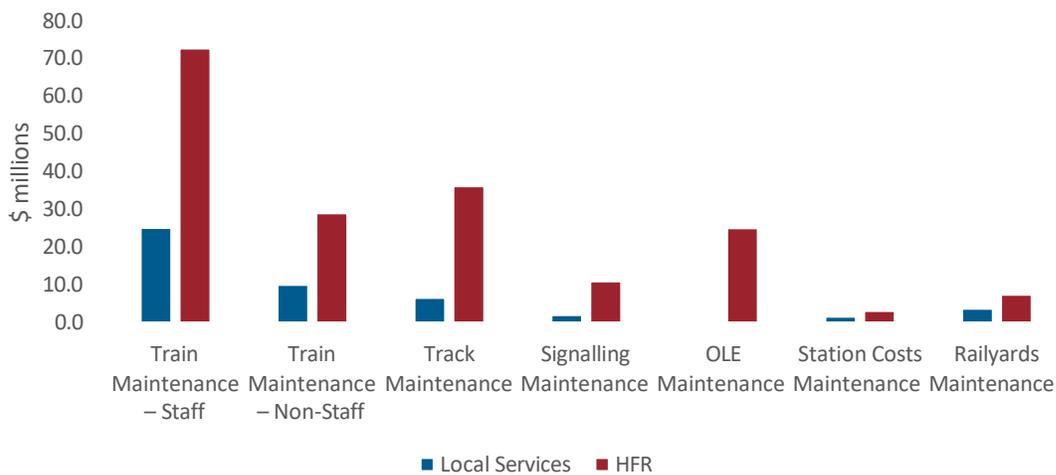


Figure 63: Annual maintenance cost in 2030 for HFR and Local services (\$m, 2020 prices)

[Redacted text block]

An initial assessment of existing station assets has been undertaken. Site visits have been completed for most HFR and Local stations in Ontario to confirm information. The visits include:

- Visual station inspections with the on-site VIA station management staff to understand the condition, services, amenities, passenger flows, and overall functionality of each station. Observations were compared against a Station Configuration and Compliance Assessment

Matrix developed by the OE for the project to identify gaps. This includes the arrangement of platforms and station tracks.

- Interviews with key station staff on how they see the station functioning, what works well, what does not, what they would like to see changed, what they want to keep.
- For stations that do not exist, or which need to be relocated/rebuilt, the site visit is to identify any constraints that are not readily apparent from using Google Earth or other “remote” sources.
- Identification and evaluation of non-compliance issues or opportunities to improve stations.
- Recommendations on a station-by-station basis and cost of mitigation for non-compliance.

Due to the evolving COVID19 Pandemic and associated local or regional safety restrictions, the JPO's Owners Engineer was unable to visit the stations in Quebec. Assessments of these stations will be undertaken at a later time when safe to do so. Upon completion of the station site visits a consolidated Stations Report will be produced.

In the next phase of the project the JPO will undertake a more detailed assessment of existing assets. Within the capital cost estimates, approximately \$142 million is associated with upgrade and rehabilitation of existing track, structures, and stations owned by VIA for HFR.

10.5. Risk Management

The JPO has adopted a Risk Management methodology for the HFR project in accordance with best practice standards, such as ISO 31000 and published guidance from the Project Management Institute (PMI). The objective of the risk management approach is to identify, quantify, mitigate, and monitor the project risks throughout the project's lifecycle.

Through multiple discussions and workshops, the risks were identified, classified, the probability of each respective risk event occurring was assessed, risk owners were assigned, and response measures were proposed. This information has been categorized into a project risk register, which will be in continuous update as the project evolves.

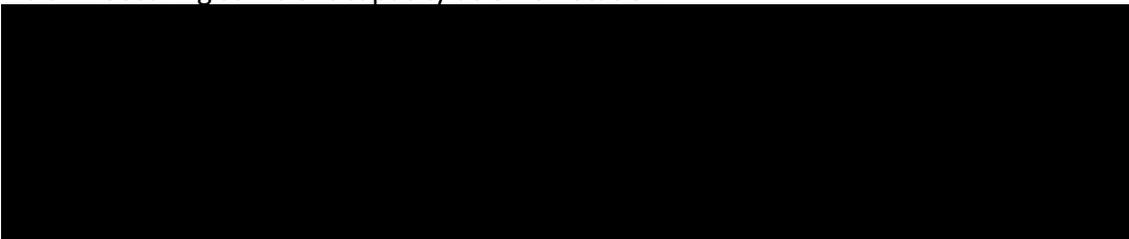
The following Table 43 summarizes the top risks identified at this stage of the Project and ranked using a qualitative score (1 to 5) applied to probability of occurrence and cost/schedule impacts. The subsequent Risk Score reflects the multiplication of the score applied to the probability with the highest score applied either to the cost or schedule. For the full list of identified risks, refer to the Risk Management Methodology report (273496-QMO-000-RP-RI-0001-EN) and the complete risk register developed to date.

Table 43: Summary of top risks identified and ranked for the project

RBS Category	Risk Description	Allocation	Risk Score
Planning & Procurement	Review, approval, coordination, and agreements with CP	Government of Canada	25
Planning & Procurement	Lack of capacity at and access to Union Station	Government of Canada	25
Planning & Procurement	Rail operation modelling is not sufficient. Rail operation modelling has not considered all operators (passenger and freight), potentially resulting in additional track infrastructure	Government of Canada	25
Sociopolitical & Legal	Commitment from Host railways regarding future access to Host Railway Tracks during construction, operation, and maintenance phases	Government of Canada	25
Planning & Procurement	Unknown Archaeological and Cultural Heritage findings	Government of Canada	25
Electrification	Safe working distances, vertical clearances, or other issues with third-party agreement for electrification works and process	Government of Canada	25
Planning & Procurement	CP might request additional changes to the current scope of the project	Government of Canada	25
Planning & Procurement	Review, approval, coordination, and agreements with CN. Effective commercial agreement with CN	Government of Canada	25
Planning & Procurement	Review, approval, coordination, and agreements with Metrolinx.	Government of Canada	25
Planning & Procurement	Lack of a detailed utility investigation report while alignments/corridors are being defined	Government of Canada	20

The risks and the risk scores in the table have been updated for inclusion in this business case following a series of risk workshops. Identified risks and the required mitigations are being assessed and implemented as work is progressed. The main risks are summarized below.

10.5.1. Securing sufficient capacity at Union Station



While an additional cost allowance has been made for additional infrastructure to increase the track capacity and reduce dwell times at platforms, there is perceived to be a high risk that, on the assumption that Union Station is to be the terminus in Toronto, the costs may increase further.

10.5.2. Electrification

As stated in earlier sections, the intent is to electrify the majority of the HFR route. This would include tracks that would either be shared with freight railways or immediately adjacent to

freight tracks. [REDACTED]

10.5.3. Works to Utilities

At this stage of the project, little is known about the existing utilities throughout the corridor as a comprehensive utility search has not yet been completed throughout the entire HFR corridor. A cost allowance of [REDACTED] has been included in the cost estimate for utility diversions throughout the corridor, and a risk remains that this may increase after inspections have been undertaken.

10.5.4. Works to At-Grade Crossings

A cost allowance of [REDACTED] has been included in the cost estimate for works at each road crossing (for upgrades to at-grade crossings). There is a risk that this allowance may increase as a result of:

- additional measures being required, after the completion of the detailed site specific safety assessment;
- public pressure to grade separate additional crossings to address social acceptability concerns; and,

11. Role of VIA

This section outlines the role of the Public Sector (be it through VIA or any other governmental entity) based on the various procurement options being considered for HFR and Local Services. Figure 64 outlines the expected delineation of scope and responsibility between the public sector (VIA) and a Private Partner under the different procurement models considered.

Activities	Description	DBFM 1	DBFOM 2	DBFOM 3
Maintenance Costs				
Train Maintenance – Staff	Maintenance	Public	Private	Private
Train Maintenance – Non-Staff	Maintenance	Public	Private	Private
Track Maintenance	Maintenance	Private	Private	Private
Signalling Maintenance	Maintenance	Private	Private	Private
OLE Maintenance	Maintenance	Private	Private	Private
Station Costs Maintenance	Maintenance	Private	Private	Private
Railyards Maintenance (TMC & MMC)	Maintenance	Public	Private	Private
Fuel – Diesel (Volume and Pricing)	Operations	Public	Shared	Shared
Fuel – Electricity (Volume and Pricing)	Operations	Public	Shared	Shared
Operating Costs				
On Train Staff	Operations	Public	Private	Private
Locomotive Engineers	Operations	Public	Private	Private
On Board Product Costs	Operations	Public	Private	Private
Sales Commissions	Operations	Public	Public	Private
VIA Customer Center & Service Staff	Operations	Public	Private	Private
Marketing & Branding	Operations	Public	Private	Private
Signalling Operations	Operations	Public	Private	Private
Station Staff	Operations	Public	Private	Private
Station Costs Opex	Operations	Public	Private	Private
Reservation & Ticketing (IT Systems)	Operations	Public	Private	Private
Revenue Management & Collection	Operations	Public	Public	Private
Head Office / Admin – Staff	Operations	Public	Public	Public
Head Office / Admin – Non-Staff	Operations	Public	Public	Public
TSA Costs	Operations	Public	Public	Public
Corporate Strategy	Operations	Public	Public	Public
Fare Policy	Operations	Public	Public	Public
Safety, Regulation, Performance Standards	Operations	Public	Public	Public

Figure 64: Public and private sector operations and maintenance responsibilities

12. Communication Plan

To inform the public and key stakeholders, as well as to support the Indigenous, public, and stakeholder engagement activities, the JPO has developed an integrated communications plan for Phase 2.

Phase 2 communications objectives include:

1. Inform and raise awareness of the HFR Project and the public consultation activity across all audiences.
2. Collect feedback on positive attributes and areas of concern about the HFR Project from key stakeholders, including municipal leaders and officials, Indigenous communities, landowners, residents, businesses, local organizations, and community groups.
3. Maximize participation of target audiences in engagement activities in communities along the proposed alignment routes.
4. Meet the regulatory requirements of IAAC, as it pertains to the public participation throughout the Impact Assessment.

All JPO communications activities will follow the following values:

Project Values

- **Connectivity:** Connect more communities from Québec City to Toronto through an enhanced intercity rail network that will improve travel options, be a greener choice, and have a positive impact on local economies.
- **Accessibility:** Increase equitable access to passenger services for all people regardless of physical ability or socio-economic situation.
- **Efficiency:** Respect taxpayers' contributions by abiding by best practices in the industry and by efficiently managing the project.

Communications Values

- **Transparency:** Communicate consistently with all stakeholders in an open and receptive fashion.
- **Respect:** Listen to and recognize stakeholders' concerns and opinions about the project, and integrate their recommendations when feasible
- **Fairness:** Ensure impartial and just treatment of all stakeholders, regardless of their position or views on the project

The JPO developed the following overarching communications strategies for Phase 2 consultations:

- Build a communications action plan specific to each major GoC announcement and for specific components of the project
- Note a specific strategy and communications plan has been developed for landowners.
- Set a positive tone by anticipating and preparing for key announcements.
- Use a phased approach to ensure local stakeholders and communities are informed and consulted regarding critical decisions that affect them.
- Collaborate with partners and key stakeholders on public communications to ensure they are fully informed.
- Use third parties when appropriate to reinforce communications.
- Use Plain English and French and simplified communications tools, in particular video and visuals, to explain complex notions.
- Maximize reach by adopting an integrated communications approach when appropriate.
- Respond quickly to inquiries and comments, either by the public or by the media, to ensure accurate information circulates in the public domain.
- Correct factual errors quickly.
- Ensure communications are available in English and French and are published simultaneously when bilingual communications are required.

Key Messages

- **People-friendly:** Passenger rail will be a more enjoyable and convenient way to travel in Canada's most densely populated region, with a new fleet of trains, more frequent departures and reduced travel times. It will improve connectivity between major cities and equitable access to passenger service by bringing intercity rail to new communities and a wider population in the Toronto, Ottawa, Montréal and Québec City areas.
- **Eco-friendly:** HFR will reduce greenhouse gas emissions. It will offer people an option with a much lower carbon footprint than cars or planes. And in this digital age, with more of us working from home, HFR will create more opportunities for people to live in the community of their choice by making travel, including commuting, a greener, more accessible and more convenient option. HFR will be a model of sustainable transportation.

- **Growth-friendly:** In the 21st century global economy, the most competitive countries are those characterised by increasing movement among their metropolitan regions. Connecting Canada's two largest urban regions, Toronto and Montréal, with faster, greener, more frequent and more reliable passenger rail will help attract talent and generate innovation, improving Canada's competitive advantage on the world stage. And at points in between, it will help attract and retain residents, tourists and businesses, to make sure our smaller communities remain vibrant, and continue to thrive.

To assess and streamline media and stakeholder inquiries, and to ensure coordination with the parent parties, the JPO created an internal request management process.

As part of the communications work, the JPO developed the following measurement approach:

Approach

- Developing a detailed methodology and process that encompasses media and social monitoring, reporting, and analysis (including dashboarding and visualizations).
- Conducting more robust monitoring in alignment with public consultation, stakeholder engagement, and media relations campaigns, focusing on campaign messaging and specific communities.

Key Performance Indicators (KPIs) & Critical Success Factors (CSFs)

- Monitoring based on KPIs and criteria —including impressions, key messages, HFR mentions, sentiment analysis, social mentions, presence of HFR spokespeople, etc.
- Determining other CSFs, such as responding to media inquiries within two hours and flagging social media posts that require follow-up within three hours.

Monitoring and reporting tenets:

- Using an automated search and data capture, combined with human analysis, to provide meaningful real-time monitoring and insights.
- Including regional and national news databases in English and French, sourcing content from licensed/premium and free sources: print-edition newspapers, broadcast, online, and blogs (e.g., Globe & Mail, Toronto Star, La Presse, etc.).
- Reporting that includes social media mentions (i.e., Twitter) in English and French. Specific social media channels will be evaluated and included (e.g., Facebook), based on specific community engagement.
- Creating dashboards that allow us to track and optimize efforts in real-time and identify and understand emerging issues.
- Providing weekly, monthly or quarterly reports to provide analysis over time to see change and trends and look more closely at key issues and campaigns.