

City of Markham: VIA High Frequency Rail Strategic Business Case



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City of Markham: VIA High Frequency Rail Strategic Business Case

Prepared by:

Steer
40 University Avenue, Suite 606
Toronto, ON M5J 1T1
Canada

+1 (647) 260 4860
www.steergroup.com

Prepared for:

City of Markham
101 Town Centre Boulevard
Anthony Roman Centre
Markham, Ontario
L3R 9W3

Client ref: PO: 22226
Our ref: 24297601

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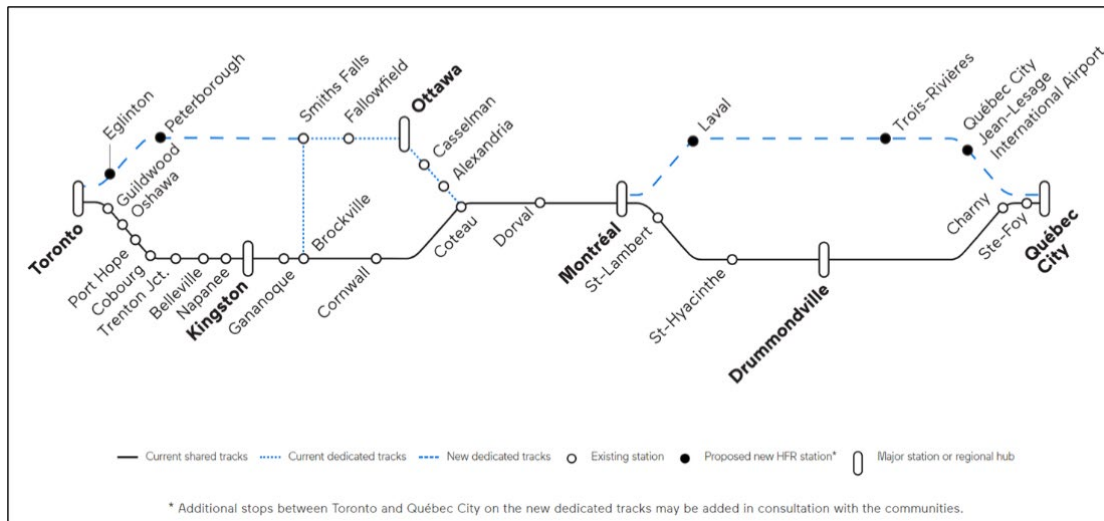
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Executive Summary

Business Case Scope

This document is a strategic business case for an additional station in Markham on the Toronto to Quebec City High Frequency Rail (HFR) line – a project proposed by VIA Rail Canada in 2021 to enhance their passenger rail services, as shown in **Figure E.1**. This strategic business case evaluates the City of Markham’s proposed HFR station through strategic, economic, and deliverability and operational lenses.

Figure E.1: VIA Rail Canada's Proposed HFR Network



Proposed Station

The City of Markham is proposing the addition of a HFR station along the Toronto – Quebec City HFR line. The proposed station would be in the City’s Box Grove neighbourhood, which is situated in southeast Markham, approximately 9 km from downtown Markham, as shown in **Figure E.2**.

Figure E.2: Proposed Markham Station in Relation to the Southern Ontario HFR Corridor



The proposed station location was determined through an alternative locations analysis, as detailed in Chapter 3 of the business case, for suitable stations sites that are along the proposed VIA Rail HFR corridor and within the City’s boundaries. A short list of three station options were chosen for evaluation along the corridor. The three sites were screened based on a range of criteria to determine the preferred site. Out of the three sites, the Box Grove neighbourhood site was selected as the preferred option because of its connection to the existing and planned transportation network, feasibility to construct and operate, and alignment with regional and city policy, including development potential and proximity to major destinations.

Three scenarios for the Box Grove site were tested to account for a range of potential capture rates (the extent to which the station causes mode-shift to HFR) and station cost scenarios. The capture rates (defined in section 5.4.1 of the Strategic Case chapter) were identified from existing regional rail corridors to represent low (1%), medium (8.5%), and high (15%) levels of potential demand for commuter trips. Coupled with the capture rates was a range of capital cost estimates, with a low-end cost (assuming a minimal build station), a high-end cost (to represent a station with full amenities and station access infrastructure) and a middle point between these estimates assumed. The low capture rate was coupled with the low cost scenario, medium capture rate with the medium cost scenario and high capture rate with the high cost scenario.

Performance Summary

Table E.1 summarizes the performance of the proposed Markham HFR station at the Box Grove site across strategic, economic and deliverability and operational considerations.

Table E.1: Markham HFR Station Performance Summary

Strategic Case		Business Case Performance	
Outcome	Benefit	Summary	Key Metrics
Outcome 1 – Enhancing Markham and York Region Economic Development	Benefit 1 – Providing new fast connections to employment centres	Connection to Markham’s growing employment hubs (technology, business, and manufacturing), could lead to greater economic productivity for the city and region.	Adding new connections to Markham and York Region: <ul style="list-style-type: none"> • Markham to downtown Toronto with 15-to-30-minute travel time. • Markham to Toronto’s Yonge-Eglinton Centre with 20-to-30-minute travel time. Markham to Peterborough with 40-to-70-minute travel time.
	Benefit 2 – Expanding talent that can easily access Markham and the surrounding York Region	HFR could facilitate reliable rapid connections to Markham as a net job importer for people who work in Markham but live outside its boundaries, and vice versa.	Serving nearly 40,000 jobs within a 5 km catchment of the proposed station (as of 2041).
	Benefit 3 – Growing the Region’s role as a knowledge centre and post-secondary destination	By increasing connectivity between Markham and Toronto, Ottawa, and Montreal, an HFR station in Markham would improve access to the future York University Markham Centre Campus and connections to Ontario and Quebec-based institutions in cities along the corridor.	Better connecting multiple post-secondary institutions between Ontario and Quebec
Outcome 2 – Supporting Urban Development	Benefit 4 – Supporting Markham secondary plans and development areas	HFR could increase connections to high-density development Secondary Plan areas, enabling access through non-auto travel.	Providing a new rail connection for up to 80,000 people who live within 3 km of the proposed station (as of 2041)
	Benefit 5 – Creating development opportunities in Box Grove	Should a HFR station be located at the Box Grove site, the neighbourhood could benefit from increased development potential through MTO’s transit-oriented communities policy.	Potential to deploy an HFR station as part of a new development program where station delivery is funded by a development third party.
	Benefit 6 - Supporting development of the Seaton Community and Northern Pickering	A HFR Station could provide rail access to planned development in Pickering via transit or a short auto trip	These communities are within 15 minutes by car. New transit connections could provide competitive transit connectivity between the station and the community, allowing Seaton residents to access Toronto, Ontario, and Quebec by rail.

Outcome	Benefit	Summary	Key Metric
Outcome 3 – Expanding Tourism	Benefit 7 – Supporting Destination Markham and Experience York Region	Markham’s allure as a destination for services, parks, trails, and cultural facilities could be enhanced with an HFR station increasing the catchment area for these attractions.	Expanding tourism opportunities for current 1.7 million tourists to Markham, while potentially attracting more tourists.
	Benefit 8 – Increasing access to and usage of Rouge National Urban Park and Other Major Destinations	The proposed Markham HFR station would neighbour Rouge National Urban Park and could enable increased park usage, supporting the significant investments made to the park as a natural attraction. It will also improve rail access to the Toronto Zoo and Toronto Pan Am Sports Centre.	Augmenting over \$140+ million investment in Rouge National Urban Park with expanded access.
Outcome 4 – Supporting the Success of High Frequency Rail and the Regional Transportation Network	Benefit 9 – Developing a ‘Union Station Alternative’ for easier access to VIA	A Markham HFR station would provide an alternative stop to Union station for customers outside of downtown Toronto, which could save travel time for VIA customers, reduce local traffic, auto emissions, and improve road safety by decreasing congestion on the road network.	Providing a station that is up to 30 minutes faster to access for 5 million residents than Union Station once open (assuming 2041 network)
	Benefit 10 – Growing the ridership of the HFR program	Expand the VIA HFR customer base across various customer types and markets along the corridor that otherwise would not be served by HFR or have difficulty accessing the system.	Opportunity for 250-3,800 new daily HFR trips by 2041.
	Benefit 11 – Improved regional travel times and sustainability	Significant travel time savings for commuters and inter-city travellers can be realised by the service, especially with an access point in Markham, leading to GHG emission reductions and road decongestion.	30-to-40-minutes time savings for travellers using the Markham HFR station
	Benefit 12 - Provide rail service to a potential Pickering Airport	An HFR station in Markham is well positioned to serve the proposed Pickering Airport by car as well as by potential transit expansions	The planned Pickering Airport would be located 15 minutes by car from the Markham Rail station.

Economic Case		Business Case Performance (2022 \$ Millions, Present Value)		
Category		Scenario 1 - Low Capture/Cost	Scenario 2 - Medium Capture/Cost	Scenario 3 - High Capture/Cost
Costs		\$32	\$62	\$83
Benefits		\$15	\$128	\$226
Benefit Cost Ratio		0.5	2.1	2.5
Net Present Value		\$(17)	\$66	\$134

Deliverability & Operations Case	Business Case Performance
Project Delivery	The proposed station is anticipated to have a feasible delivery if executed as part of the overall HFR Project. The risks associated with construction impacts are anticipated to be no more or less on the local environment than those of the overall HFR Project.

Business Case Summary

The proposed HFR station in the Box Grove neighbourhood evaluated in this Strategic Business Case would enhance connectivity to the regional rapid transportation network and enable fast and sustainable travel choices to major centers within Ontario and Quebec. This added connection would benefit both residents of the Greater Toronto Hamilton Area and the case for the VIA HFR scheme alike.

Based on this Strategic Business Case, Markham and York Region may continue to develop the station concept, including:

1. More detailed preliminary planning to build upon the ‘pre-feasibility analysis’ conducted in this business case. This analysis would include more detailed site analysis and initial development of a station concept and operational plan;
2. Developing integrated transit service and infrastructure plans to explore feasible improved connections to the station site; and
3. Exploring co-development opportunities for mixed-use transit-supported communities adjacent or on top of the station site.

1 Introduction

1.1 Introduction and Business Case Objectives

In 2022, the City of Markham, with support from York Region, commissioned Steer to investigate the potential business case for an additional station in Markham as part of the Toronto – Quebec City VIA Rail High Frequency Rail (HFR) Corridor. Potential rail stations in Markham on this rail corridor have been examined in the past, with a study¹ completed in 2010 to assess market potential and ridership demand, costs, technology options, station locations and delivery considerations for the reinstatement of passenger rail service between Peterborough and Toronto.

Steer was tasked with reviewing previous studies and assessing recent advances in HFR delivery and planning across North America (and internationally) to advise the City of Markham and York Region on two key objectives:

1. Prepare a Strategic Business Case (SBC) for a station in Markham on the proposed Toronto to Quebec City HFR line; and
2. Prepare a draft submission for the City of Markham to submit to the HFR Joint Project Office (JPO) based on the strategic business case.

This report is the final Strategic Business Case that outlines the emergent findings of this investigation.

¹ “Peterborough Rail Study Final Report” (February 2010)
https://www.metrolinx.com/en/regionalplanning/projectevaluation/studies/Peterborough_Rail_Study.pdf

1.2 Report Structure

The remainder of this document summarizes work completed to assess the feasibility of a HFR station in Markham and is divided into:

- **Chapter 2 – Case for Change** – provides background on the project, defines the opportunity the Markham HFR station aims to capture, and identifies the broader value to the city, region, and project of solving it.
- **Chapter 3 – Station Alternatives and Analysis Methodology** – an overview of the range of potential stations considered in this business case and the methodology used to select and analyze a single alternative ‘reference station’.
- **Chapter 4 – Strategic Case** – defines the range of benefits to travellers, the City of Markham, the Regional Municipality of York, and the broader project that the proposed station will realize.
- **Chapter 5 – Economic Case** – assesses the potential socio-economic benefits and costs of the station and evaluates its overall value for money in economic terms.
- **Chapter 6 – Deliverability and Operations Case** – provides a high-level assessment of HFR station feasibility in Markham based on approaches to deliver, manage, and operate the station, including any key risks that must be mitigated.
- **Chapter 7 – Business Case Summary** – provides a summary of the business case and a recommendation on a HFR station in Markham.

2 Case for Change

2.1 Overview

The Case for Change defines the overarching rationale for pursuing a Markham HFR station by articulating a key opportunity a Markham HFR station could realize. It includes the following sections:

- **Background and HFR Scope** – a summary of the HFR project and scope known to date
- **Opportunity Statement** – a summary of why a Markham HFR station could benefit the region
- **Strategic Outcomes** – a summary of the key benefits the region could realize

2.2 Background and HFR Scope

VIA Rail Canada is currently developing the High Frequency Rail (HFR) program, which aims to address two key issues:

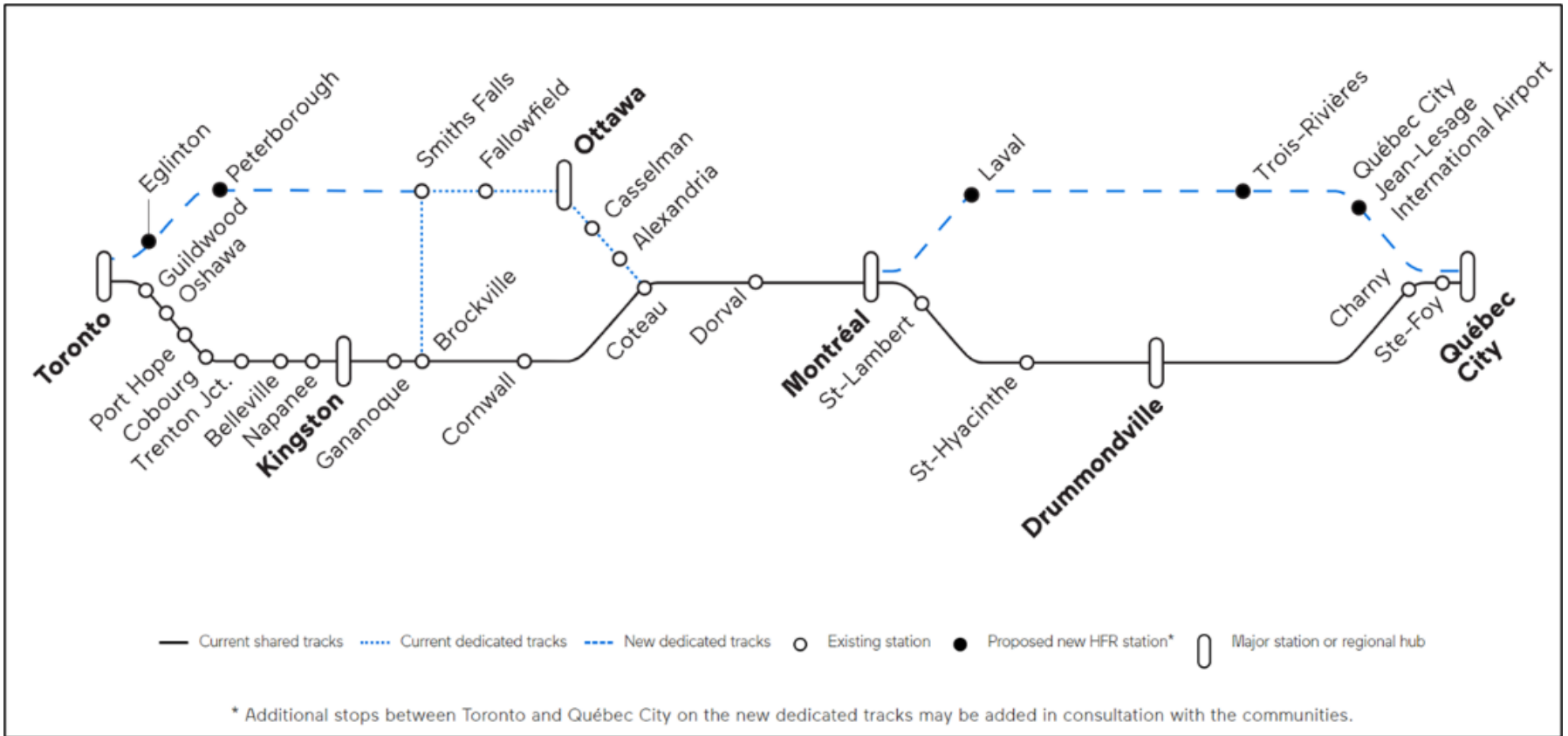
- **Minimize delays and enhance travel times through dedicated tracks** – VIA Rail Canada currently shares tracks with freight trains, which have right-of-way over VIA Rail-operated passenger trains. This issue of priority interferes with passenger trains on-time performance, negatively impacting riders.
- **Support continued demand and revenue growth** – In 2019, VIA Rail Canada reached its highest annual ridership of 5 million passengers². VIA has identified they are reaching the limits of growth and quality service within their existing network and service offer.

To address future growth, VIA Rail Canada has proposed transforming passenger rail service in Canada by operating new trains on dedicated tracks between the major centers of Toronto, Peterborough, Ottawa, Dorval, Montreal, Trois Rivières, and Québec City, as seen in **Figure 2.1**. The Government of Canada has committed over \$70 million to date in advancing the due diligence and project development of HFR³.

² “Proposal for High Frequency Rail in the Québec City – Toronto Corridor” (2022)
<https://corpo.viarail.ca/en/projects-infrastructure/high-frequency-rail>

³ “High Frequency Rail Request for Expression of Interest,”
https://buyandsell.gc.ca/cds/public/2022/03/09/2af08443ae81fcea5940d166dc898c3e/ABES.PROD.PW__N.B.B003.E81058.ATTA001.PDF.

Figure 2.1: VIA Rail Canada’s Proposed HFR Network⁴



⁴ “Proposal for High Frequency Rail in the Québec City – Toronto Corridor” (2022) <https://corpo.viarail.ca/en/projects-infrastructure/high-frequency-rail>

VIA's current plans note that:

- The HFR proposal would separate passenger and freight rail operations, providing more capacity for both people and goods⁵.
- The dedicated tracks could provide up to three times the current frequency of VIA Rail service and reduce intercity auto trips, thereby reducing greenhouse gas emissions and road congestion⁶.

The target benefits of HFR are⁷:

- Connecting new communities to major urban centres;
- More daily departures, including in the communities served on the existing VIA corridor;
- Shorter trip times;
- Considerably improved on-time performance;
- Substantial economic impact, including the creation of thousands of jobs; and
- Significant contribution to the reduction of road congestion and thus, greenhouse gas (GHG) emissions.

2.3 Exploring VIA HFR Service in Markham

2.3.1 Background and Rationale

The core benefits of the HFR program identified by VIA Rail focus on connecting communities, reducing travel times, and unlocking the economic impact of increased connectivity. The proposed HFR alignment runs through York Region and the City of Markham; however, currently there are not plans to include a rail station along this section of the corridor.

The inclusion of a Markham station could be jointly beneficial to the VIA HFR Program and support a range of regional and local policy goals. Key strengths of a potential station have been identified in **Table 2.1**, and alignment with municipal and regional policy in **Table 2.2**, which are used throughout this document to define a station location and evaluate its business case.

⁵ "High Frequency Rail: Request for Expressions of Interest"

https://buyandsell.gc.ca/cds/public/2022/03/09/2af08443ae81fcea5940d166dc898c3e/ABES.PROD.PW__NB.B003.E81058.ATTA001.PDF

⁶ "High-frequency rail: Reimagining the way we live and travel" (August 2021)

<https://www.thewhig.com/opinion/letters/high-frequency-rail-reimagining-the-way-we-live-and-travel>

⁷ <https://corpo.viarail.ca/en/projects-infrastructure/high-frequency-rail>

Table 2.1: Opportunity Assessment – How Could a Markham Station Support VIA HFR?

Strength or Opportunity	Description
<p>Leveraging proposed alignments for greater impact and efficiency – traditionally, new rail-based transit projects can be cost prohibitive. In the case of VIA HFR, a new station in Markham would make use of trains and track already being provided for an expanded purpose.</p>	<ul style="list-style-type: none"> • The HFR program is anticipated to make use of the Havelock subdivision, which runs through the City of Markham • This would allow the VIA program to serve additional communities in York and Durham Regions without significant investment in new track beyond the core scope of the program
<p>‘Filling the gap’ in the rail network – the Havelock subdivision and HFR program could be leveraged to fill a gap in the GO Rail network.</p>	<ul style="list-style-type: none"> • This would allow travellers expanded access to rail and reduce time spent accessing rail stations • It could also reduce automobile distance travelled in support of environmental goals
<p>Two-way travel patterns – VIA HFR will provide two-way service with trains coming into Toronto from Ottawa and Peterborough as well as in the reverse direction. The City of Markham could contribute to increased ridership demand on the HFR line given its prominence as a business and employment hub and cultural destination.</p>	<ul style="list-style-type: none"> • Markham is a net importer of jobs, which could increase demand on VIA throughout the day • Markham also exports employees to Toronto and elsewhere in the region • Proximity to attractions, Rouge National Urban Park, could increase off-peak and weekend VIA usage • These demand flows could increase ridership and revenue on HFR while improving local economic conditions and quality of life.
<p>Creating a northern gateway – today, VIA rail service from Union Station may require travellers to backtrack to downtown Toronto. A new Markham station could make it easier to use VIA for the millions of residents in the “905” area code region.</p>	<ul style="list-style-type: none"> • A station in the City of Markham could reduce travel time accessing VIA and provide VIA a greater catchment area of Markham’s neighbouring municipalities in the “905” area code region as seen in Figure 2.2.

The delivery of a Markham HFR station would align with several regional and municipal policy goals:

Table 2.2: Opportunity Assessment – How Does a Markham Station Align with Regional Policy?

Authority and Policy Document	Policy Alignment
Ministry of Transportation of Ontario – 2022 GGH Transportation Plan	5.1.12 Work with Infrastructure Ontario and Metrolinx to develop transit-oriented communities at new and existing transit stations (page 31).
Ministry of Transportation of Ontario – 407 Transitway EPA Study	The 407 Transitway is a planned rapid transit corridor initially planned for bus rapid transit (BRT) with the opportunity to convert to light rail transit (LRT) in the future. This corridor would meet with the Havelock Rail Sub presenting a potential HFR connection point
Metrolinx – 2041 Regional Transportation Plan (RTP)	The 2041 RTP contains in delivery or planned investment to the Markham transportation network including Stouffville Corridor 15-min two-way all-day rail service, the Highway 7 BRT extension and other bus network improvements that could better connect HFR to the Region’s rapid transportation network
York Region – 2022 Official Plan	York Region has major transit station areas (MTSAs) which are planned and designed to support transit infrastructure and accommodate a range and mix of land uses, housing types, employment, active transportation amenities and activities. MTSAs are planned to support rapid transit investments and accommodate an appropriate scale of development.
York Region – 2022 Transportation Master Plan	A well-connected HFR station will support TMP aims to increase the use of more active and eco-friendly modes of transportation that help to manage the demand put on the road network by single-occupant vehicles, and supports the Plan’s principle to be flexible and agile with planning and change direction when new ideas (such as HFR) emerge
York Region Transit – YRT 2021-2025 Business Plan	YRT will support provincial initiatives to reboot the economy through large-scale capital investments. Focus will shift to providing connections between YRT base routes and higher order transit in York Region as it is built
City of Markham – 2014 Official Plan	Protect existing rail lines and promote rail as a safe and efficient means of moving people and goods while providing communities with a range of residential and employment land uses and complementary and supporting commercial and community uses

Figure 2.2: Proposed Markham Station in Relation to the Southern Ontario HFR Corridor



2.3.2 Opportunity Statement

A station in the City of Markham would augment the VIA HFR program and support key policies and plans for the City of Markham, York Region, and the GTHA. It could do so by:

- Connecting the City of Markham’s growing employment hubs and education centres to the rest of the GTHA and areas across Ontario and Canada;
- Adding rail-based connectivity to support urban development goals;
- Expanding traveller choice and reducing journey times by connecting to existing and planned transit and providing an alternative destination along the HFR network; and
- Providing transit in areas near affordable housing, access to services, cultural facilities, parks and trails.

2.4 Strategic Outcomes

Table 2.3 shows the potential strategic outcomes and their corresponding benefits that could be realized if a station in the City of Markham was included in the proposed HFR network.

Table 2.3: Strategic Outcomes for a Markham HFR Station

Strategic Outcome	Benefit
Outcome 1 – Enhancing Markham and York Region Economic Growth	Benefit 1 – Providing new fast connections to employment centres
	Benefit 2 – Expanding talent that can easily access Markham and the surrounding York Region
	Benefit 3 – Growing the Region’s role as a knowledge centre and post-secondary destination
Outcome 2 – Supporting Urban Development	Benefit 4 – Supporting Markham secondary plans and development areas
	Benefit 5 – Creating development opportunities in Box Grove
	Benefit 6 - Supporting development of the Seaton Community and Northern Pickering
Outcome 3 – Expanding Tourism	Benefit 7 – Supporting Destination Markham and Experience York Region
	Benefit 8 – Increasing access to and usage of Rouge National Urban Park and Other Major Destinations
Outcome 4 – Supporting the Success of High Frequency Rail and the Regional Transportation Network	Benefit 9 – Developing a ‘Union Station Alternative’ for easier access to VIA
	Benefit 10 – Growing the ridership of the HFR program
	Benefit 11 – Improved regional travel times and sustainability
	Benefit 12 - Provide rail service to a potential Pickering Airport

3 Potential Station Alternatives and Analysis Methods

3.1 Introduction

This chapter introduces the station option (reference station) that is evaluated through the three cases that constitute the Strategic Business Case (SBC). It includes the following sections:

- **Business As Usual:** a description of the baseline transportation network assuming HFR implementation without a station in Markham.
- **Potential Station Locations:** a summary of the process and station location sites considered for final analysis in this SBC based on transportation network connectivity, destination proximity, land use, development potential and delivery and operational feasibility.
- **Reference Station:** a description of the station used in the three evaluation chapters.
- **Analysis Approach:** a summary of the market analysis approach used for the reference station, which is further applied in chapters 4-5.

3.2 Business as Usual

3.2.1 Role of Business-as-Usual Scenario

The Business as Usual (BAU) scenario is a 'no build' scenario that illustrates a future where the Markham HFR Station is not built. The BAU acts as the baseline in which the investment has not occurred and existing business practices, committed transportation plans and general trends continue. All analysis in this business case is 'incremental' to the BAU, meaning it aims to illustrate the potential changes to traveller behaviour and regional development that would not occur without the Markham HFR station.

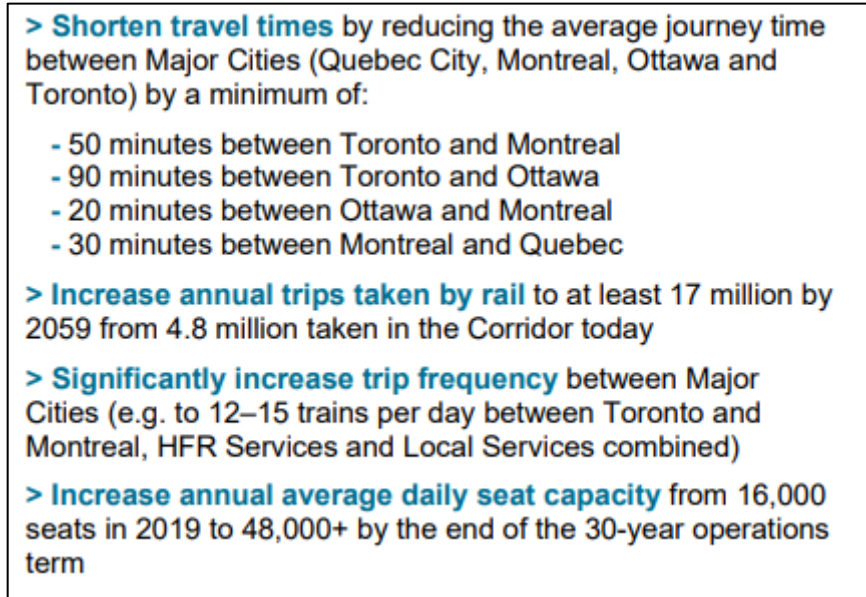
3.2.2 Business as Usual Assumptions

The BAU assumes that in future year 2051 the full VIA HFR corridor will be in operation without a station location in the City of Markham. As per the Government of Canada's Request for Expressions of Interest (RFEOI), the current HFR concept within the Greater Golden Horseshoe area (GGH) would contain station locations at Toronto Union, Eglinton and Peterborough. While full details about the HFR project are still to be determined by the Federal Government and future project partners, for the purposes of this SBC, several assumptions were made on the overall HFR Project.

Key assumptions made in this study are:

- The alignment of the future HFR dedicated corridor between Toronto and Ottawa is similar to the existing alignment between Toronto and Peterborough on the Havelock Subdivision, Belleville Subdivision and Don Branch;
- Level of service will roughly double when compared to existing VIA rail Toronto-Ottawa-Montreal corridor services, meaning the Toronto-Peterborough-Ottawa route will have roughly the same amount of service as the existing corridor; and
- Travel time improvements on the HFR corridor are assumed from VIA rail⁸ as follows between major destinations:

Figure 3.1: Assumed HFR Travel Time Improvements



Beyond the scope of the HFR project, the following projects are assumed to be in operation as part of the 2051 regional transportation network as outlined in the Province’s Greater Golden Horseshoe Transportation Plan:

- 407 Transitway, from Brant Street in Burlington to as far east as Brock Road in Pickering, operated as a BRT with the potential for other concepts in the corridor not excluded;
- Highway 7 BRT east extension from Unionville GO station to east of Ninth Line (Cornell Bus Terminal);
- GO Expansion on the Barrie GO, Richmond Hill GO and Stouffville GO rail corridors in York Region; and
- GTA expanded Subway network into York Region.

⁸ “High Frequency Rail: Request for Expressions of Interest”
https://buyandsell.gc.ca/cds/public/2022/03/09/2af08443ae81fcea5940d166dc898c3e/ABES.PROD.PW__N.B.B003.E81058.ATTA001.PDF

3.3 Options Development

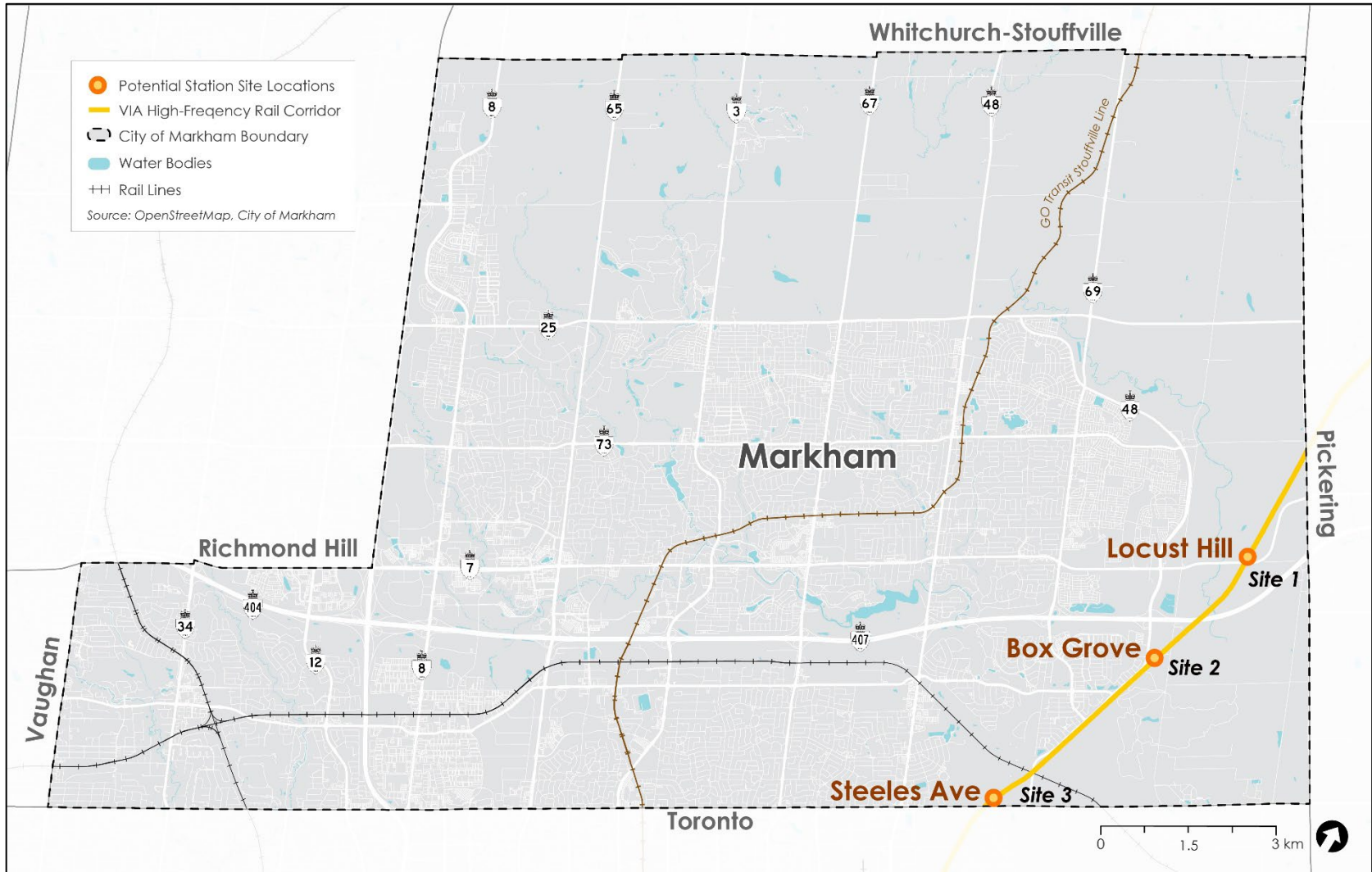
3.3.1 Station Location

The location of the proposed station in the Business Case was determined through an alternative locations analysis for stations along the proposed HFR corridor within City of Markham boundaries. A list of potential stations was generated that considered all potential locations along the corridor. These potential stations were screened based on a range of criteria to determine a preferred site. The criteria used in this analysis was:

1. Existing Transportation Network Connectivity – Existing transit services (bus, BRT, LRT, Subway, GO rail, VIA) running through or near (within 800m) the station site
2. Future Rapid Transportation Network Connectivity – Planned rapid transportation connections in the future network within the 800m catchment area
3. Proximity to Major Destinations – Points of interest (schools, health care facilities, shopping centre, tourist, and recreational attractions) within an 800m walkshed of the station location
4. Existing and Surrounding Land Use – Land use on and surrounding the station site
5. Development Potential – Ease of developing the station on existing land uses and development on adjacent lands
6. Feasibility to Construct – Delivery and operational considerations (track alignment, road access, staging work location)

Figure 3.2 shows the three station locations within City of Markham boundaries identified for the location analysis.

Figure 3.2: Map of Potential Markham HFR Station Locations



3.3.2 Site 1 – Locust Hill

The first potential station site is located in the Locust Hill area on the eastern limit of the City of Markham, west of the York-Durham line. This station would serve the fast-growing developments in the east Markham area such as Cornell, as well as future developments in the Pickering/Seaton area. The station would be located on the same site as a previous VIA rail station, north of Highway 7 and approximately 35km upstream from Union Station. This site was previously studied in Metrolinx’s 2010 Peterborough Rail Study Final Report⁹ for a potential reinstated Toronto – Peterborough commuter rail service. The site would be close to a future eastern extension of the Highway 7 BRT corridor to provide a connection to the Region’s future rapid transportation network. It could also be serviced by the future Highway 7 rapid transit line from Durham Region identified in the Metrolinx Regional Transportation Plan.

The station site and surrounding lands are located within Greenbelt lands. Further analysis on these potential constraints is required to understand if this site would be permitted for potential station development and if any transit supportive development could occur on adjacent station lands. If a station were deemed appropriate to build in this location, delivery and operations could be straightforward given that the site would have easy access from Highway 7 and is located on a straight-line section of the rail corridor.

3.3.3 Site 2 – Box Grove

The second site analyzed is in the Box Grove neighbourhood. The station is envisioned to be placed west of Reesor Road and east of Donald Cousens Parkway where it meets Copper Creek Drive and is approximately 31km upstream from Union Station. This location is served by York Region Transit (YRT) bus services, and in the future would be adjacent to the planned 407 Transitway. A direct connection between the HFR station and 407 Transitway should be explored in future study as the two corridors will cross paths in an area with undeveloped lands, some of which are owned by the Provincial Government and protected for a potential rail station as per the 407 Transitway Environmental Project Report¹⁰.

Existing land use nearby the potential HFR station site consists largely of single-family homes in a suburban road network, a retail centre and on the eastern extent of the rail corridor lies the Rouge National Urban Park (RNUP). Despite these land uses, some development is already in plan for remaining available parcels west of the rail corridor in the vicinity and development potential also exists in the nearby Cornell area just north of Highway 407 which already contains a job centre at the Markham Stouffville Health Centre. This demonstrates an opportunity for greater density and transit-friendly land uses in the station area. Further, the size of the potential station area is such that the station could provide a full suite of station access facilities for users of all modes (walking, local transit, cycling, auto).

⁹ “Peterborough Rail Study Final Report” (February 2010)
https://www.metrolinx.com/en/regionalplanning/projectevaluation/studies/Peterborough_Rail_Study.pdf

¹⁰ “407 Transitway Environmental Project Report” (February 2011)
<https://407transitway.com/400ToKennedy/environmentalProjectReport.html>

Proximity to the RNUP also presents an opportunity, as it would serve as a major attraction for HFR users. Lastly, the site has straightforward road access, lands for construction staging works and is situated on a segment of straight-line track which would keep construction and operating costs lower compared to a station on a curved track alignment. The immediate area does however house potential heritage properties, the status of which should be confirmed in further detailed study.

3.3.4 Site 3 – Steeles Ave.

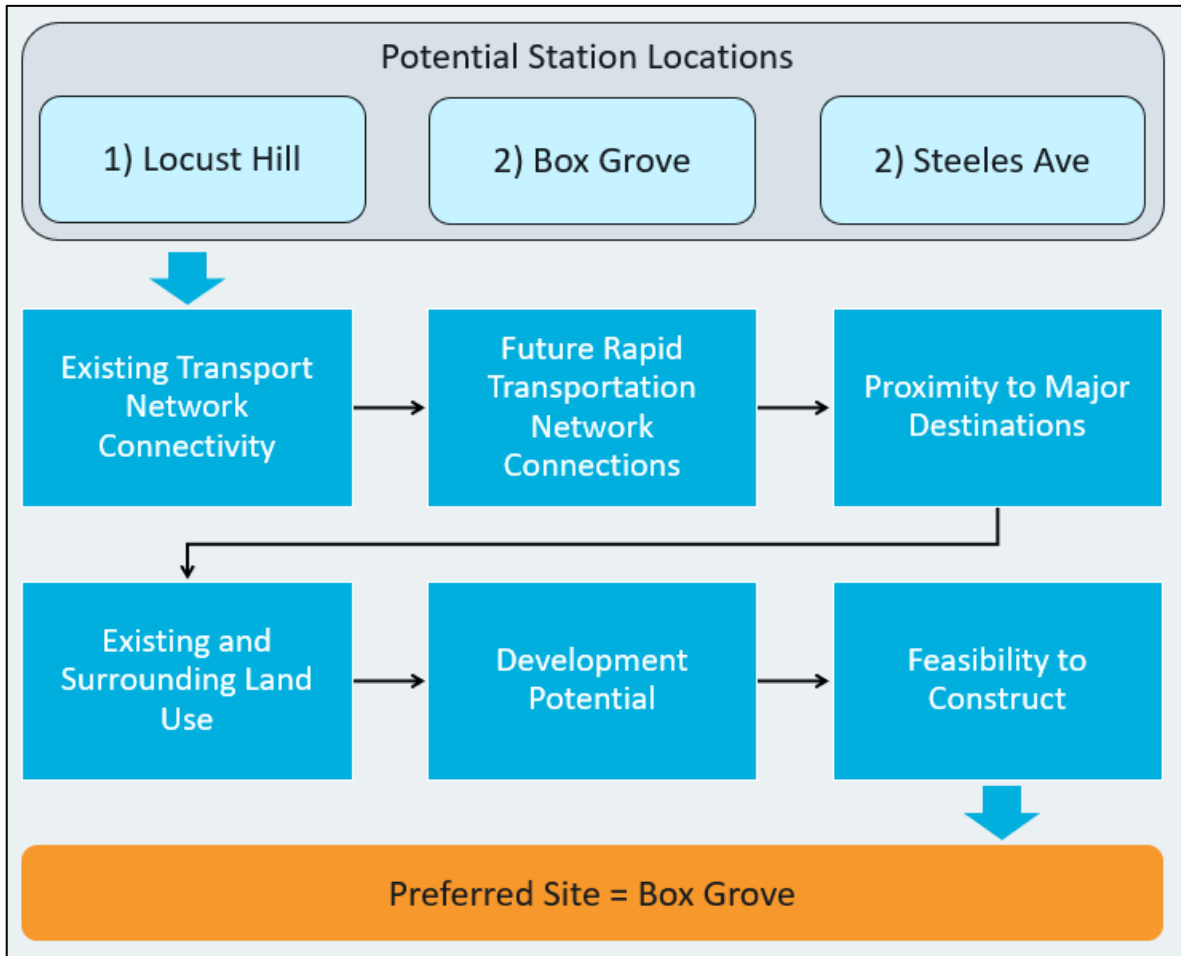
The final site deemed suitable for consideration is located at Steeles Avenue. The station would sit on the southern portion of the rail corridor and north of Steeles and would be approximately 28km upstream from Union Station. This station site was also analyzed in the 2010 Metrolinx Peterborough Rail Report. The site is currently served by Toronto Transit Commission bus service and, in the future, could be served by a Steeles Avenue Priority Bus service per Metrolinx's Regional Transportation Plan.

Development in the immediate surrounding area of the site is sparse and includes several golf courses and suburban-style residential neighbourhoods. The station site sits adjacent to the protected Rouge River but does not itself lie within the Greenbelt nor national park. A station at or near Steeles Avenue would serve developments in South Markham, Milliken and around Rouge Valley and could support further development should the golf course lands ever be redeveloped. The station would sit on a section of slightly curved track and contains easy access from Steeles Ave but may have constraints regarding nearby lands for construction staging.

3.4 Reference Station

Through review of the six station assessment criteria as shown in **Figure 3.3**, it was determined that a station location in Box Grove was the preferred site. A station at Box Grove would be connected to the existing transportation network (Highway 407, Viva curbside service), have potential for a direct future 407 Transitway interchange, be in proximity to developable lands, existing communities and attractions and is likely to be feasible to build and operate while also aligning with city, regional and provincial policy.

Figure 3.3: Station Evaluation Process



3.4.1 Rationale for Box Grove

- **Transit Connections** – A HFR station located in the Box Grove area of Markham has great potential to connect to existing and planned rapid transportation corridors, enhancing the overall transportation network in the GTA, and providing an additional way for commuters within Markham, eastern Durham Region, the GTA and beyond to move about and access jobs and amenities throughout the urban region.
- **Existing and Potential Land Use** – A Box Grove HFR station would be situated amongst existing retail and residential lands uses that could support ridership, that contain the potential for further development and density to support station performance and align with

municipal and provincial policy. This site is the most central to existing development of the three sites examined while also maintaining proximity to the Rouge National Urban Park attraction and is situated nearby to the Cornell area, which contains existing and planned employment uses.

- **Site Considerations** – Of the locations examined, a HFR station at Box Grove is the least constrained by delivery and operational factors. The current track alignment is straight, thus leading to fewer rail operational impacts and a shorter stop time at the station, road access is straightforward for users coming to and from the station by all modes and there should exist multiple sites in the vicinity for the station building, access amenities and construction staging ground.

3.5 Analysis Methodology of Reference Station

For the purposes of this Strategic Business Case analysis the performance of the reference station location was assessed against the following criteria in the following three chapters:

- Desired strategic outcomes and benefits – ability to realize potential strategic outcomes and their corresponding benefits.
- Forecasted demand and travel time savings – potential ridership and travel time savings achieved by ridership capture scenario, based on a combination of national census data and regional Transportation Tomorrow Survey (TTS) data; the methodology is detailed in section 5.4.2.
- Capital, operating and maintenance costs – estimates based on regional costing estimate best practice for the delivery and continued operation of a rail station.
- Delivery and operational considerations – identify (based on available information) the factors that must be considered by all delivery parties for implementation, and how the station could impact planned HFR operations.

Given the cross-provincial nature of the HFR project, the analysis approach could not assess the station in the context of a single regional demand transportation model and dataset, as a single model(s) are typically confined to one urban region. For the purposes of this assessment data sources (National Travel Survey, TTS) had to be combined to obtain a picture of potential demand and time savings across the HFR corridor.

4 Strategic Case

4.1 Introduction

The Strategic Case summarizes the performance of the options against identified strategic outcomes to indicate if the investment addresses the Opportunity Statement and benefits the VIA HFR Project. Criteria were developed and selected to evaluate the preferred station location's ability to meet policy objectives and support the realization of the strategic outcomes. This chapter is structured around the four outcomes defined as follows:

Outcome 1	Enhancing Economic Development Leveraging High Frequency Rail to connect Markham and York Region employment centres to the broader GTHA - and beyond – and more commuters to jobs in the Markham and York Region area.
Outcome 2	Supporting Urban Development Positioning High Frequency Rail and the connectivity it brings as a catalyst for urban development.
Outcome 3	Expanding Tourism Combining a Markham Station and High Frequency Rail service to grow Markham and York Region's role as a destination within the Greater Toronto Hamilton Area and broader province.
Outcome 4	Supporting the Success of High Frequency Rail and the Regional Transportation Network Integrating High Frequency Rail with the broader Greater Toronto Hamilton Area (GTHA) transportation network to increase ridership, save travellers' time, provide alternative options to travel by car, and reduce greenhouse gas emissions.

4.2 Outcome 1 – Enhancing Markham and York Region Economic Growth

4.2.1 Outcome Overview

According to the 2022 York Region Official Plan, employment in York Region is expected to grow to 992,000 by 2051, a 66% increase compared to 2016. Approximately 30% of this forecasted growth is expected to be driven by employment growth in Markham¹¹ through 301,000 jobs. Transportation plays a critical role in supporting local and regional economic development, innovation, and competitiveness. This outcome section explores how focused investment in a new HFR station in Markham can support this employment growth and attract new investments and talents while also enhancing regional economic productivity.

It is assessed in three benefits:

- Benefit 1 – Providing new fast connections to employment centres
- Benefit 2 – Expanding talent that can easily access Markham and the surrounding York Region
- Benefit 3 – Growing York Region’s role as a knowledge centre and post-secondary destination

4.2.2 Benefit 1: Providing new fast connections to employment centres

What is the benefit?

The benefit illustrates how improved connectivity between Markham and the broader region could result in expanded economic activity.

Previous empirical research on the link between transportation and economic development notes:

- Economic productivity is strongly related to proximity – as more jobs ‘cluster together’ there is an opportunity for expanded collaboration and innovation, and therefore productivity
- Travel time between major job clusters can also influence productivity – as the ‘time’ between two sites decreases, there is an opportunity for expanded productivity

Why discuss Markham and York Region’s Economic Development Potential?

York Region is the third largest business centre in Ontario, with 640,000 jobs within the Region as per the 2020-2023 York Region Economic Development Action Plan. Similarly, Markham is Canada’s densest technology hub, with 4.56 Information and Communications Technology (ICT) business establishments per 1,000 residents as per the December 2017 Statistics Canada Canadian Business Counts and the 2016 Statistics Canada Census. Anchored by more than 1,500 technology and life sciences companies that account for more than 35,000 jobs concentrated within the Highway 404 - Highway 407 corridors, Markham’s business community is also known for banking, financing, engineering, design, technical, and commercialization services. Additionally, more than 2,500 manufacturing businesses operate within York Region, making York the third largest manufacturing cluster in Ontario and fifth largest in Canada.

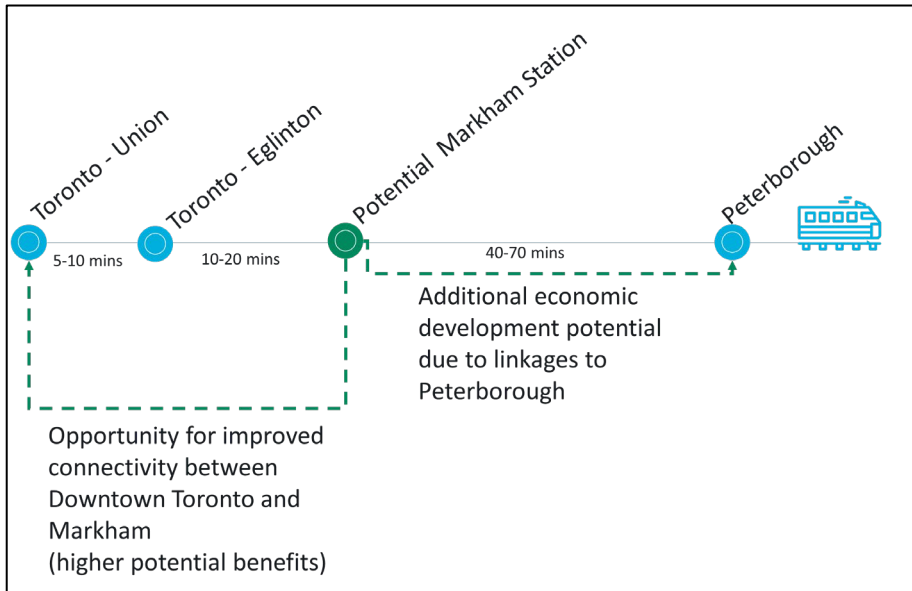
¹¹ “York Region Official Plan,” (July 2022), <https://www.york.ca/newsroom/campaigns-projects/have-your-say-your-community-0>.

This effect is referred to as ‘Agglomeration Economies’. Investments in the transportation network that reduce travel times can: augment productivity and also encourage increased intensification of employment (more jobs located within a community) over time.

How can an HFR station in Markham realize the Benefit?

An additional HFR station in Markham is an opportunity to expand connectivity between economic centres in Markham and Toronto and Markham and Peterborough. These expanded connections could lead to improved productivity. This relationship is illustrated in **Figure 4.1**.

Figure 4.1: Impact of HFR on Markham’s Connectivity to Other Economic Centres



Initial estimates suggest that an HFR service stopping at Markham could reduce travel times between major economic centres¹² – including:

- A 15-to-30-minute direct connection between Toronto’s Financial District (Union Station) and Markham
- A 20-to-30-minute connection between Toronto’s Yonge-Eglinton Centre and Markham using a combination of VIA Rail and TTC Eglinton Crosstown LRT line
- A 40-to-70-minute connection between Markham and Peterborough
- Travel time improvements between Markham and cities further east, which may influence office location and investment decisions

These reductions in travel time, when combined with economic development strategies and programs, could lead to improved productivity and investment in Markham and the surrounding region, given the strength and growth potential of its diverse and technology-driven economy. Specific employment centres that may benefit include those located in Markham Centre (planned

¹² Travel times are based on public materials provided by VIA related to travel time savings for HFR and existing run times for GO Rail and VIA rail between stops in the GTHA. They do not reflect detailed operational modelling.

to contain 106,000 residents and 72,000 jobs) or along the Highway 404 employment corridor which at present contains over 1,750 businesses in Markham and 990 businesses in Richmond Hill along the lands bordering the Highway. The proposed station location is approximately a 10-to-15-minute drive from Markham Centre and 15-to-20-minute drive from the northern extent of the Highway 404 employment corridor, with potential for transit network improvements to provide fast transit connections as well.

4.2.3 Benefit 2: Expanding talent that can easily access Markham and the surrounding York Region

What is the benefit?

Transportation options have a strong influence on employment choice. Research into the wider economic benefits of transportation has shown that providing a range of fast, frequent, and reliable travel options can lead to 'labour supply' economic benefits. Transport projects impact the labour market in two ways:

- Increasing the labour supply by lowering time spent travelling, which increases the 'distance' a commuter is willing to travel for a job (expanding the number of jobs they can choose)
- Expanding the pool of labour available to employers

This can allow workers to move to more productive (higher wage) jobs and augment the viability of employment centres and individual firms. In turn, these effects can lead to increased productivity, investment, and local expenditure.

How can an HFR station in Markham realize the benefit?

The City of Markham is a net job importer and home to approximately 11,000 companies.¹³ Its diverse and technology-driven economy means that talent comes from far and wide not only within Markham but also from adjacent municipalities within the GTHA to work in Markham and peripheral areas. HFR would facilitate reliable and rapid connections for people who work in Markham but live outside of its boundaries, and vice versa. By decreasing access times to the country's densest concentration of information and communications technology jobs and the Highway 404 employment corridor, the amount and quality of candidates matching with ideal roles would increase, making Markham and by extension Ontario and Canada a more competitive place to work in and attract talent.

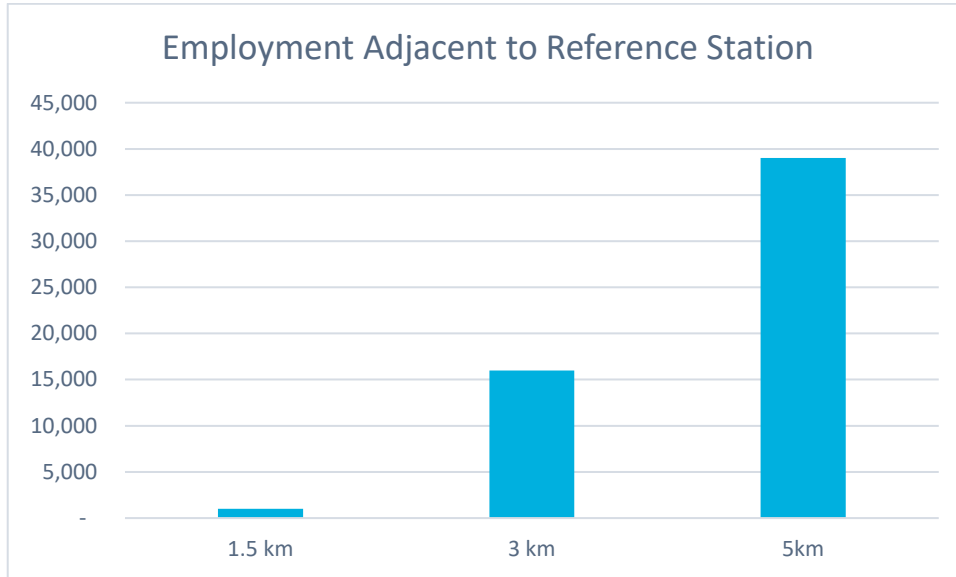
The proposed station location would require additional transit linkages to key employment sites to allow commuters to make best use of the station. If successful, this benefit could mean:

- Potential time savings for travellers who already commute to Markham
- Increasing the attractiveness of Markham as a place to work for people who live in downtown Toronto, the Eglinton corridor in Toronto, or Peterborough
- Increasing the ease of access of Markham businesses for occasional site visits and meetings for people living in other major Canadian cities such as Ottawa and Montreal along the proposed corridor

¹³ "Markham Economic Profile" (2022), www.business.markham.ca.

An HFR station could expand rail-based connectivity to jobs within Markham and nearby communities. In 2041, the station would be within 5km of nearly 40,000 jobs. The accessibility of the station is shown in **Figure 4.2**.

Figure 4.2: Markham HFR Employment Accessibility (5km) in 2041



Commuters alighting at Markham HFR station would likely be travelling by walking or transit to complete the last leg of their journey.

Table 4.1: Land Uses Areas of Note within 60-minute Walk and Transit Travel Time

id	Use Type
1	Mixed Use Health Care Campus
2	Mixed Use Mid & High Development, Business Park
3	Service Employment, General Employment
4	Mixed Use Low & Mid Development
5	Service Employment
6	Mixed Use High Rise & Low Rise Development, Office Priority
7	Business Park, Service, & General Employment, Commercial
8	Mixed Use Mid Rise Development, Commercial, Business Park

Figure 4.3 and **Figure 4.4**¹⁴ show areas that can be reached within 15-, 30-, 45-, and 60-minutes on each mode using existing infrastructure and service (assuming an 8am weekday departure time from the HFR station). Key areas of employment include:

- **Within a 15-to-30-minute walk** – business park employment and mixed-use development along Highway 7 between 9th Line and Reesor Road and mixed use mid rise development, commercial, and business park along Copper Creek Drive between Box Grove By-pass and Donald Cousens Parkway
- **Within a 45-minute transit ride** – mixed-use health care campus along Highway 7 between 9th Line and Reesor Road, service employment and general employment along 14th Avenue between McCowan Road and Markham Road
- **Within a 60-minute transit ride** – mixed-use development at McCowan Road and Highway 7, mixed-use development on the eastern side of Markham Centre, and commercial, business park employment, service employment, and general employment along Alden Road/14th Avenue between Warden Avenue and Kennedy Road

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5	Service Employment
6	Mixed Use High Rise & Low Rise Development, Office Priority
7	Business Park, Service, & General Employment, Commercial
8	Mixed Use Mid Rise Development, Commercial, Business Park

¹⁴ Sourced from [TravelTime API](#)

Figure 4.3: Walk Times from the Proposed Markham HFR Station

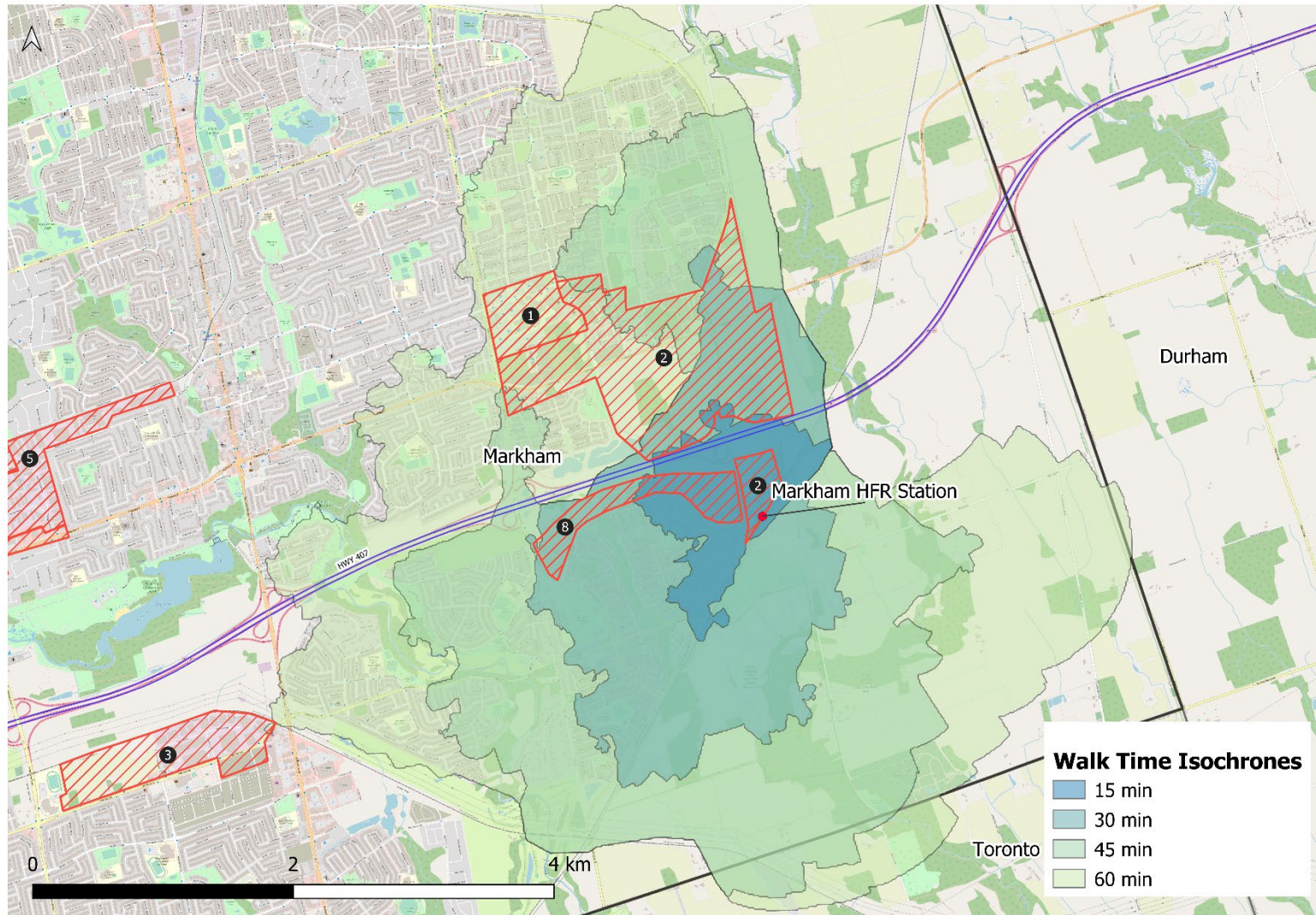


Figure 4.4 Transit Times from the Proposed Markham HFR Station



Potential Wider Regional Benefit – Combining Markham Station with a 407 Transitway

Transit times to key employment areas within Markham and surrounding regions will likely decrease due to the planned 407 Transitway, which is located adjacent to the proposed Markham HFR station. The 407 Transitway will be able to provide a rapid link between the station and employment lands along Highway 407, which include Markham Centre and the Highway 404 employment corridor. While travel times on this service are not known, it is anticipated that they could significantly decrease travel time along the east-west corridor regardless of the transit concept applied in the planned corridor.

4.2.4 Benefit 3: Growing the Region’s role as a knowledge centre and post-secondary destination

What is the benefit?

The benefits of improved connectivity are not only realized by companies and firms. Education centres – including research intensive and instructional post secondary institutions – can also benefit from improved connectivity. When an investment offers faster travel times and improved reliability, there are a range of potential improvements, including:

- Connections to major employment centres and financial districts, which support collaboration between post secondary institutions and the private sector
- Improved access for specialized workers required to successfully operate post secondary institutions
- Expanded travel choice for students and visitors

How can an HFR station in Markham realize the benefit?

Markham is a talent hub with a student population that is expected to grow. A new HFR station in Markham could realize this benefit in three ways:

- **Providing regional and national access to York University Markham campus** – the new campus is scheduled to open in Spring 2024 to more than 4,000 students, plus faculty and staff, and would be accessible by car and public transit as per **Figure 4.5**. As the campus expands operational capacity, it has flexibility to accommodate up to 10,000 students¹⁵.
- **Additional connections to Seneca College** – Markham is also home to one of Seneca College’s campuses; across all locations, Seneca is Canada’s largest college. Existing travel times between the College and potential station site are shown in **Figure 4.5**.
- **Provincial and National connections** – Increased connectivity between Markham and Toronto, Peterborough, Ottawa, and Montreal will make Markham’s post-secondary education resources more accessible to other cities along the HFR line. In turn, post-secondary education in Toronto, Peterborough, Ottawa, and Montreal will become more accessible to people living in Markham.

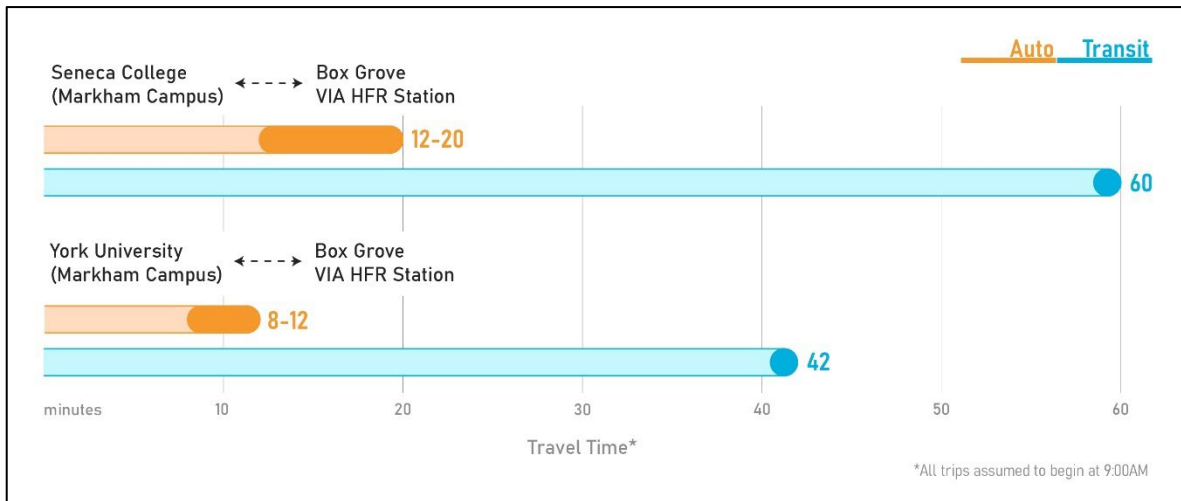
What are the benefits to post-secondary institutions outside of Markham?

Post-secondary institutions located outside of Markham receive improved travel times when travelling east of the GTHA using VIA HFR due to the presence of an additional HFR station in Markham..

Students at institutions such as York University Keele Campus and University of Toronto Scarborough Campus would receive 10 and 20 minutes of travel time savings respectively to destinations such as Peterborough or Ottawa when commuting to Markham HFR station by car.

¹⁵ “York University Markham Centre Campus,” The Official Site of the City of Markham, accessed August 2022, [https://www.markham.ca/wps/portal/home/about/city-hall/city-projects-initiatives/current/york-universitycampus#:~:text=The%20construction%20of%20the%20campus,\(up%20to%2010%2C000%20students\)](https://www.markham.ca/wps/portal/home/about/city-hall/city-projects-initiatives/current/york-universitycampus#:~:text=The%20construction%20of%20the%20campus,(up%20to%2010%2C000%20students).).

Figure 4.5: Existing Travel Times Between Box Grove and Markham Post-Secondary Institutions



The above travel times are per the existing transportation network. With further investments to the local public transportation network, i.e., Highway 407 Transitway, Highway 7 BRT extension, local transit travel times will significantly decrease from existing times.

4.3 Outcome 2 – Supporting Urban Development

4.3.1 Outcome Overview

This outcome area focuses on how an HFR station can support Markham’s goals for Urban Development – including developing complete communities that are accessible and affordable. Two benefits have been considered:

- Benefit 4 – Supporting Markham Secondary Plans and Development Areas
- Benefit 5 – Creating New Development Potential in the Box Grove Area
- Benefit 6 - Supporting development of the Seaton Community and Northern Pickering

Why focus on Marham’s Urban Development?

Markham, the largest municipality in York Region and fourth largest in the Greater Toronto Area, is located approximately 30-kilometers northeast of downtown Toronto. Its population of more than 354,000 is expected to grow to 421,600, or 19%, by 2031 and a further 45% to 611,000 by 2051¹¹.

The amenities and quality of life assets that accompany Markham’s housing are equally of note. The city is known for its strong school system and high-quality healthcare services, including Markham Stouffville Hospital, which is part of the Oak Valley Health Network.

4.3.3 Benefit 4: Supporting Markham secondary plans and development areas

What is the benefit?

This benefit focuses on how a Markham HFR station can support specific goals within Markham secondary area plans. These plans include:

- **The Markham Centre Secondary Plan** will establish the community as “a nexus for higher order transit, where 15-minute all-day GO rail service, Viva Bus Rapid Transit, local bus service, and the 407 Transitway meet to create excellent local and regional connectivity.” The plan also emphasizes sustainable, active transportation through the development of walking and cycling networks that will improve connectivity within Markham Centre, including Unionville GO Station. This includes a trail system that will enable Markham to realize the full potential of the Rouge River Valley as an environmental and placemaking asset serving ecological, recreational, and educational functions¹⁶. Working in conjunction with the York Regional Housing Solutions Phase 2 Plan and Housing Choice Strategy, the Markham Centre Secondary Plan will provide a variety of housing options across type, size, tenure, and affordability. Through this plan, the city is developing “15-Minute” neighborhoods that are self-sustaining through convenient access to residents’ daily needs including schools, parks, retail, and restaurants, but also well connected to surrounding neighborhoods.
- Located to the north of the proposed station site is **the Cornell area**, which is slated for an updated Secondary Plan to develop the area as an urban, mixed-use, pedestrian and transit-oriented focus for the community and expanding business park, centred along the planned Highway 7 rapid transit corridor.
- The **Richmond Hill Centre/Langstaff Gateway area**, currently home to 32,000 residents and designated as a regional Conceptual Transit Hub in the Province’s GGH Transportation Plan¹⁷, will also be connected to the regional rapid transportation network with a potential one-seat ride to the Markham HFR station along the planned 407 Transitway. This regional hub is planned for significant residential and employment development intensification in the coming decades as new rapid transit connections are extended to this hub.

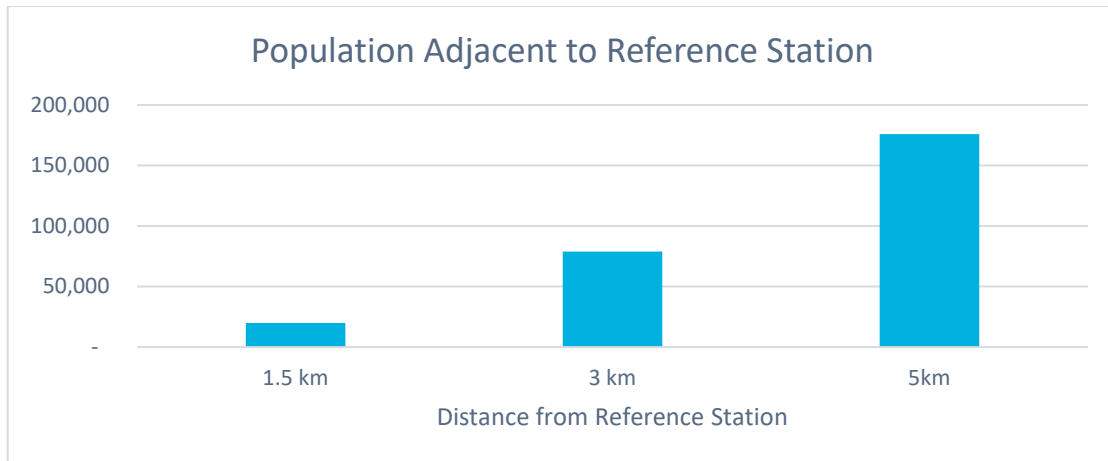
How can an HFR station in Markham realize the benefit?

An HFR station could expand rail-based connectivity to the residents of Markham and nearby communities. In 2041, the station could be easily accessed by over 175,000 people (based on a 5km access distance). The accessibility of the station is shown in **Figure 4.6**.

¹⁶ “Markham Centre Secondary Plan Update Vision Report,” (October 2020), <https://pub-markham.escribemeetings.com/filestream.ashx?DocumentId=32898>.

¹⁷ “Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe,” (February 2022), <https://files.ontario.ca/mto-ggh-transportation-plan-en-2022-03-10.pdf>

Figure 4.6: Markham HFR Population Accessibility by 2041



HFR can increase access to these secondary plan areas via the proposed station’s connection to the planned 407 Transitway and other corridors. Increased public transportation options, along with reduced travel times, to the region’s transportation network and destinations will re-enforce the planned principles for these Secondary Plan areas, enabling communities where residents can live and reach their needs through non-auto travel, both within the area and the greater Toronto region in general. HFR can support broader secondary area plan goals by further decongesting roads, enhancing safety, and better connecting communities.

4.3.4 Benefit 5: Creating development opportunities in Box Grove

What is the benefit?

Investment in new transportation infrastructure is an opportunity to co-develop new communities. This benefit focuses on using new railway infrastructure to:

- Deliver denser developments with a blend of residential and commercial land uses in the immediate station area and adjacent neighbourhoods
- Use a new rail station as a broader transit hub to bring more service to an area (allowing people who live/work there to access the site, even if they do not use the rail investment)

How can a HFR station in Markham realize the benefit?

This benefit could be realized by conducting a proactive and intentional planning process around the potential HFR station. This process should consider:

- Opportunities to plan and deliver a mixed-use transit-supported community (including affordable housing as per below) within the station area
- Key design opportunities for integrated station, housing, and commercial development
- Alignment with planned 407 Transitway services, York Region Transit local service, new mobility, and other transportation options
- Phasing development and station delivery

Should a station proceed at the Box Grove site, the neighbourhood stands to gain from increased development potential. The Ministry of Transportation of Ontario's (MTO) 2022 Greater Golden Horseshoe Transportation Plan includes policy to work with Infrastructure Ontario and Metrolinx to develop mixed-use communities at new and existing transit stations¹⁸. This policy could act as an example for how a mixed-use transit-supported community could be developed at an HFR station in Markham with the potential for a portion of station delivery to be funded by development third parties.

4.3.5 Benefit 6: Supporting development of the Seaton Community and Northern Pickering

What is the benefit?

This benefit focuses on how a Markham HFR station can support the development of the Seaton Community and wider the northern parts of Pickering. These areas have significant targets set for population and employment increases. The previous Central Pickering Development Plan set a target of 61,000 residents by 2031, while the official plan includes a range of Prestige Employment uses along the Highway 407 corridor.

How can an HFR station in Markham realize the benefit?

A rail station at Box Grove could be accessed in 15 minutes from key locations slated for development in the Seaton Community. This station would allow travellers to connect to the national rail network and travel east to Peterborough, Ottawa, or Montreal. It would also allow them the use the HFR station to connect to downtown Toronto, providing rapid access to employment and cultural activities located in the region's core.

4.4 Outcome 3 – Expanding Tourism

4.4.1 Outcome Overview

Rail investments present an opportunity to strengthen tourism and connect travellers to cultural and natural assets within the City of Markham and York Region. This outcome is synergistic with outcomes 1 and 2, as a robust tourism sector supports broader economic and urban development. This outcome is illustrated with two key benefits:

- Benefit 7 – Supporting Destination Markham and Experience York Region
- Benefit 8 – Connecting the Nation to Rouge National Urban Park

Why focus on Tourism in Markham and York Region?

According to Statistics Canada's National Travel Survey 2019, there were over 3.6 million visits to York Region in 2019. Of these visits, 53% were to visit friends or relatives and 30% were for recreation, holiday, or entertainment. Markham and York Region offer a combination of natural and cultural amenities and recreational areas that could have expanded use with improved passenger rail connectivity.

¹⁸ "Connecting the GGH: A Transportation Plan for the Greater Golden Horseshoe," (February 2022), <https://files.ontario.ca/mto-ggh-transportation-plan-en-2022-03-10.pdf>.

4.4.2 Benefit 7: Supporting Destination Markham and Experience York Region

What is the benefit?

This benefit illustrates how transportation investment can draw in additional tourists or improve the experience of tourists within the City of Markham and York Region. This means reduced time to access destinations, and more time visiting with friends and relatives, or exploring local amenities.

This benefit is relevant as part of Markham’s “Destination Markham” program. Markham boasts 260 parks, 202.9km trails and pathway systems, 8 public libraries, and 36 community and cultural facilities¹⁹. The city emphasizes placemaking initiatives, enhancing and promoting local assets to promote the well-being of community members. Of 12 key locations in the City of Markham, data shows a total aggregated number of visits in 2019 done by tourists travelling 40km+ from their homes was over 1.7 million. It is already a destination within the GTHA and is well served by the regional roads network, York Region Transit, and GO Transit. However, there is an opportunity for expanded connectivity for travellers coming from the GTHA and from across the province, nationally and even internationally.

How can an HFR station in Markham realize the benefit?

An HFR station can provide three potential ways to improve this benefit:

- Improving the experience for current travellers – each year 1.7 million people already visit Markham. An HFR station provides expanded choice and potential travel time savings for tourists who already enjoy the amenities and activities offered within the city.
- Attracting new tourists for long stays – an HFR station in Markham could make Markham more accessible for tourists coming from east of the GTHA who plan to stay for longer durations. Whether travellers are coming from within Ontario or beyond, a new rail station would provide convenient access to Markham’s many amenities and may encourage additional tourist visits.
- Increased day-trip tourism – an HFR station could encourage travellers from Toronto or Peterborough to make day trips to the sites and attractions in Markham. This, in effect, would be similar to day trips to Niagara made possible by existing rail service between Toronto Union and Niagara stations.

¹⁹ “Markham Economic Profile” (2022), www.business.markham.ca.

How accessible are attractions in York Region from the proposed Markham HFR station – including Canada’s Wonderland?

The proposed Markham HFR station is located adjacent to the planned 407 Transitway. This provides opportunities for a direct connection between the two transit services, increasing the accessibility of attractions in York Region and beyond to users of VIA Rail.

For example, Canada’s Wonderland is currently a 135-minute transit ride from Box Grove (weekday midday) using three YRT buses and requiring 30-minutes of walk time to access/egress transit.

With integrated schedules, the travel time to Canada’s Wonderland using existing transit could be reduced to 120-minutes.

Once the 407 Transitway is implemented, it could considerably reduce transit times across York Region. Assuming integrated schedules and that the 407 Transitway would operate 30% faster than existing express bus service along Highway 407, transit time to Canada’s Wonderland could decrease to approximately 60-minutes. This transit trip would only require the 407 Transitway, one YRT bus connection, and 10-minutes of walk time to access/egress transit.

4.4.3 Benefit 8: Increasing access to and usage of Rouge National Urban Park and Other Major Destinations

What is the benefit?

This benefit illustrates how improved transportation connections can:

- Increase the accessibility, use, and enjoyment of Rouge National Urban Park, a significant federal asset adjacent to Markham’s built-up area
- Increase the efficiency of investment in Rouge National Urban Park by creating new opportunities to connect to the park

In 2019, Parks Canada published its first management plan for Rouge National Urban Park, including a vision that “protects and celebrates, for current and future generations, a diverse landscape in Canada’s largest metropolitan area.” Rouge National Urban Park is open 365 days a year with no admission fee²⁰. Through development of this environmental and cultural asset, Parks Canada has pursued detailed studies on visitor use and needs and determined a baseline annual attendance of approximately 500,000 visitors²¹.

²⁰ “Rouge National Urban Park Management Plan 2019,” <https://www.pc.gc.ca/en/pn-np/on/rouge/info/gestion-management/gestion-management-2019#intro>.

²¹ “Frequently asked questions,” Parks Canada, accessed August 2022, <https://www.pc.gc.ca/en/pn-np/on/rouge/visit/projets-projects/accueil-welcome/faq>.

One of the management plan's objectives is to enhance ecological connectivity within the park and with surrounding natural areas. To do so, Parks Canada will encourage external entities to action connectivity improvements in the planning, management and operation of various modes of transportation, including rail lines, hydro corridors, and other infrastructure throughout the park. The plan identifies specific ways the park will be transformed over a ten-year period, including enhancing ecologic integrity, farm-scape stewardship, conservation and education of culture and archaeology of First Nations, trail networks, visitor experiences and activities, park monitoring and reporting, and pride of place. Parks Canada has maintained a community-driven approach to creating the national urban park beginning in 2011, engaging more than 20,000 Canadians – individuals, First Nations, other levels of government, the farming community, conservation groups, and community organizations. In addition to the time invested by Parks Canada and the great number of community partners, the Government of Canada provided an initial \$143.7 million to support the first 10 years of establishment, management, and operations of Rouge National Urban Park. It also committed \$7.6 million in annual funding for continuing operations. Various entities – including the Government of Canada, Transport Canada, the Province of Ontario, and Toronto Region and Conservation Authority – transferred more than 80-kilometers squared (km²) of land, making Rouge National Urban Park the largest and best protected urban park of its kind in North America²². An HFR station in Markham would also provide ease of access to other major destinations in York Region and Scarborough either by driving or transit – such as the Toronto Zoo, the Toronto Pan Am Sports Centre, when compared to Toronto Union Station.

How can an HFR station in Markham realize the benefit?

The proposed station site is less than 2 kilometers from the Bob Hunter Memorial Park area of Rouge National Urban Park and well within a 30-minute walk of the station as per Figure 4.3, making it easily accessible by walking and cycling. The park's location around the rail corridor and potential station can enable greater use and attraction of this federally provided service and asset and provides an opportunity to expand knowledge of the park, and its scope. With a HFR station next door to the park, the significant investments made to date by all levels of government (over \$140m in capital and \$7.6m in annual operating costs) could serve more Canadians and allow more people to enjoy the park.

²² "It takes a community to create a national urban park," Parks Canada, accessed August 2022, <https://www.pc.gc.ca/en/pn-np/on/rouge/info/jalons-milestones>.

4.5 Outcome 4 – Supporting the Success of High Frequency Rail and the Regional Transportation Network

4.5.1 Outcome Overview

This outcome focuses on how the addition of a new Markham High Frequency Rail station could benefit the overall HFR program, while also supporting connectivity across the GTHA. It focuses on the ability of a station to generate new ridership, save travellers' time, and create new demand travel opportunities.

Three benefits have been identified to illustrate the Markham station's potential:

- Benefit 9 – Developing a 'Union Station Alternative' for easier access to VIA
- Benefit 10 – Growing the Ridership of the HFR program
- Benefit 11 – Saving travellers' time and reducing GHG emissions
- Benefit 12 - Provide rail service to a potential Pickering Airport

4.5.2 Benefit 9: Developing a 'Union Station Alternative' for easier access to VIA

What is the benefit?

Today, access to VIA Rail services running from Toronto to Quebec City can be accessed at Union Station, Guildwood, or Oshawa. All stations are adjacent to the shore of Lake of Ontario and require time-consuming access trips, with some users travelling great distances by car or transit to access these stations. VIA also provides services to from west of the GTHA to Union Station with access in Georgetown and Brampton stations (Toronto-Sarnia, 1x train per day) and Oakville and Aldershot (Toronto-Windsor 3x a day). These two services require a transfer at Union Station. As a result, VIA may not be easily accessed by many potential travellers, while people using VIA today may have long access times by car or transit to reach their station. A new station can reduce access times for a portion of the existing user base and expand potential ridership.

How can an HFR station in Markham realize the benefit?

A Markham HFR station should be viewed as a Union Station alternative for residents of not only York Region, but also adjacent regions (Peel, Toronto, Durham, Simcoe).

Why focus on the role of a new station in HFR success and broader regional connectivity?

Delivering new rail infrastructure is typically costly and complex. In the case of HFR, an existing rail corridor will be used, which already runs through urbanized areas in the GTHA. This presents an opportunity to provide higher order transit connections without having to identify a new corridor and deliver entirely new infrastructure. Including an additional station in a strategic location can bring new transit connections to the region while augmenting the success of the overall HFR program.

An initial analysis of 2041 travel and population data notes that a station in Markham could be more accessible than Union Station for many travellers:

- Nearly 5 million people would have a faster drive to Markham than Union Station, with an average saving of 30 minutes in station access time
- Nearly 1.8 million people would have a faster transit ride to Markham than Union Station, with an average saving of up to an hour in station access time
- In addition, nearly 1.7 million jobs in the region could be located within a shorter travel time to Markham than to Union Station

Given the number of jobs, people, and attractions in Markham and the wider 905 area, a station in Markham connecting to the HFR corridor could generate value to:

- Existing VIA travellers
- Travellers who do not use VIA today but may use it with a closer station
- Business travellers who have work outside of the downtown Toronto financial district

Alternatively, if a station was not built in Markham, potential HFR customers would have to travel further distances to access HFR at either Union, Eglinton, or Peterborough stations, thus adding more traffic, emissions, and accident potential to the already congested regional road network.

4.5.3 Benefit 10: Growing the ridership of the HFR program

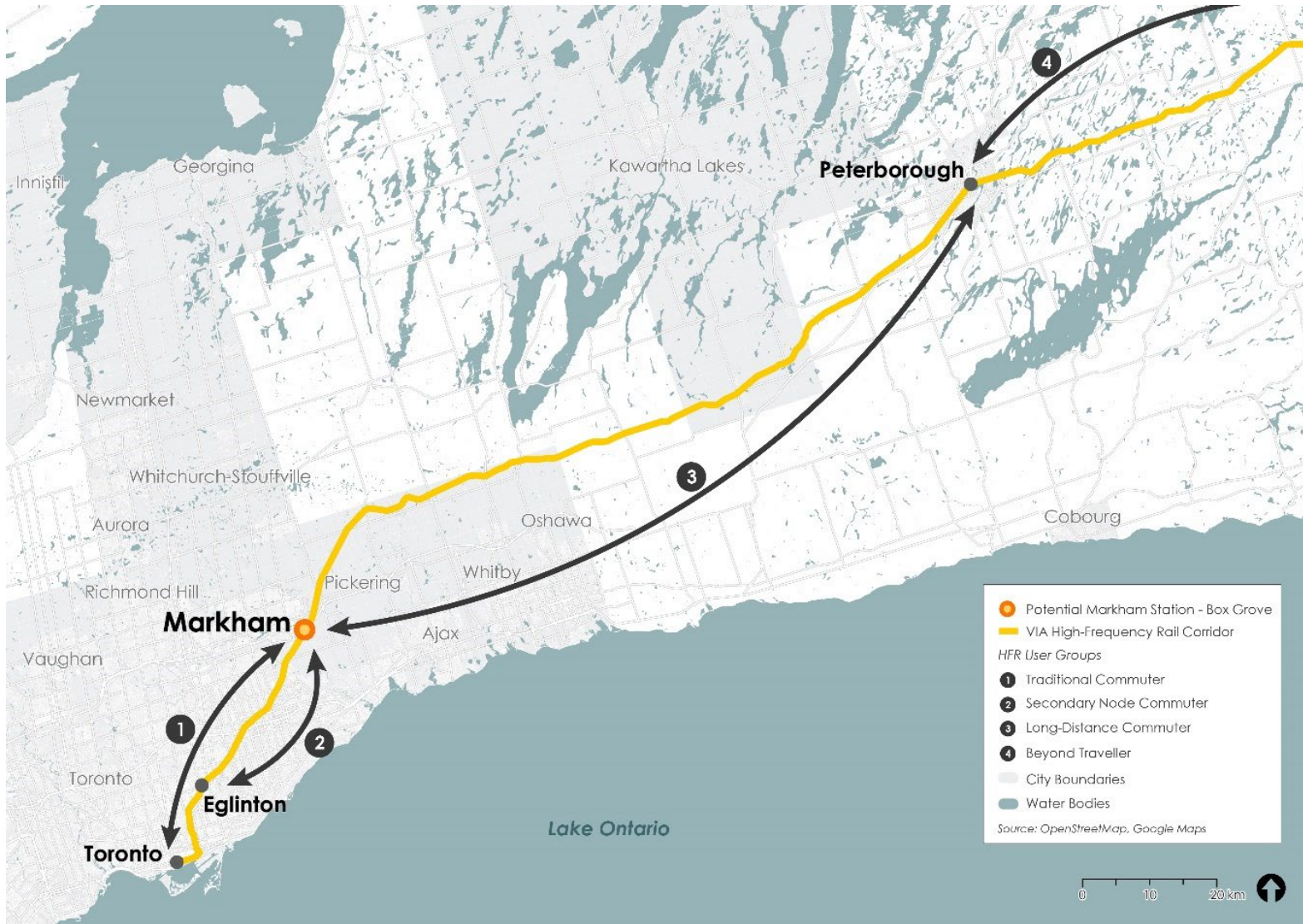
What is the benefit?

This benefit illustrates how the HFR program could see higher ridership with additional stations. The benefit includes new trips that could use the VIA HFR service that do not make use of it in the 'BAU' case without a Markham HFR station. This benefit includes a range of traveller types identified as:

- Recreational trips and commuters who travel between Markham, Eglinton, and Union ("Traditional" and "Secondary Node" commuters) or Markham and Peterborough ("Long Distance" commuters) with predictable travel patterns in the AM and PM (2-5 days per week). Today these travellers have access to automobile and transit for some trips. HFR could provide an additional transit connection.
- "Beyond" travellers performing intercity trips that travel between Markham and the rest of Ontario and Quebec for purposes such as business, leisure, or studies. Beyond auto trips, there are currently no one-seat rides between Markham and Ottawa or Markham and Montreal, with all bus and train modes requiring at least one transfer between services which adds time, cost and user inconvenience to the trip when compared to automobile travel. A Markham HFR station has the potential to remove cars and local road demand within Markham, and across the province and HFR corridor by offering a one-seat connection to some of the nation's largest cities.

These various HFR customer trip types are illustrated in **Figure 4.7**.

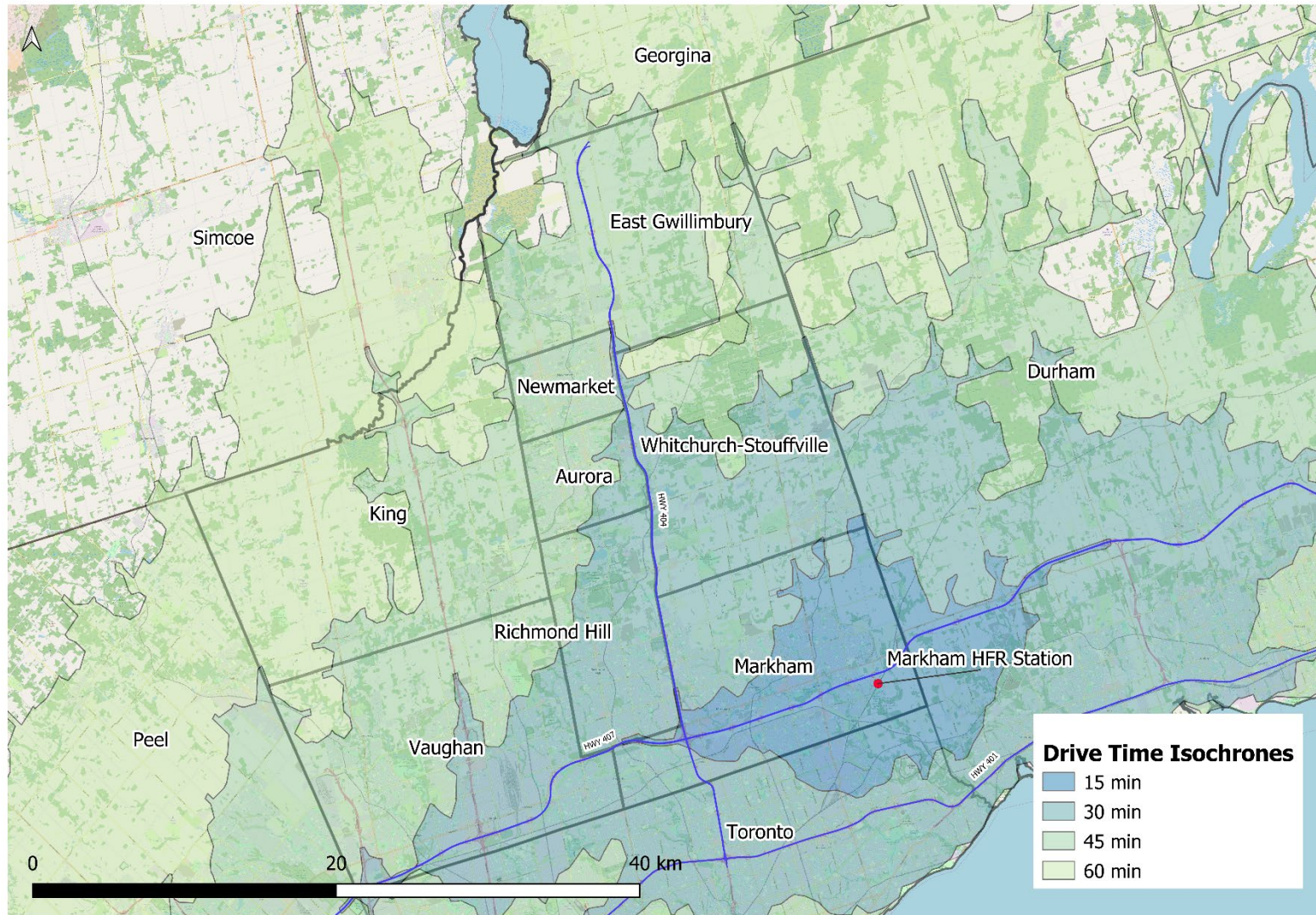
Figure 4.7: Potential HFR Customer Flows



A map showing drive times (based on road speeds) to access the proposed Markham HFR station is shown in **Figure 4.8**.²³ A significant portion of York Region is within a 30-minute drive to the station, and almost the entire Region is within a 60-minute drive. Peel and Simcoe Regions have areas within a 45-to-60-minute drive, while Durham Region has significant coverage within a 30-to-45-minute drive of the proposed HFR station and some areas within a 15-minute drive, which demonstrates the accessibility of a Markham HFR station to not just the City, but large portions of the 905 area code area.

²³ Sourced from [ORS Tools — QGIS Python Plugins Repository](#)

Figure 4.8: Drive Times to Access the Proposed Markham HFR Station (Based on Existing Road Speeds)



How can an HFR station in Markham realize the benefit?

An initial market analysis was conducted using travel data to assess potential market size. This analysis aimed to identify the number of trips that could use HFR if a station was included in Markham. This includes both commuters and travellers who stay within the GTHA as well as travellers who could use Markham to travel beyond the GTHA.

GTHA trips were forecasted using a combination of Transportation Tomorrow Survey Data and 2041 transportation demand model data. It considered:

- Travel time to access Union Station, Eglinton Station, and Markham Station from all origins in the GTHA to identify which trips could be faster using a combination of auto or transit + Markham HFR to access Union Station
- Station catchment analysis to identify how many trips begin and end within a set distance of core stations – it is assumed that commuters will not travel more than 5 km to access the Markham Station (based on GO Rail station access distances) and will not travel more than 3 km beyond Union Station in downtown Toronto
- A set of market capture rates were identified from existing regional rail corridors to illustrate low (1%), medium (8.5%), and high (15%) levels of demand for commuter trips.

Intercity demand was forecasted using the National Household Travel Survey. This data identified the number of daily trips that travel between Markham, Peterborough, Ottawa, and Montreal, and shows the percentage of total trips that could become captive VIA users if a HFR station in Markham were to be built. This analysis is summarized in **Table 4.2**.

Table 4.2: Preliminary Market Analysis – 2041 Potential In scope Travel Demand

	Total Trips	Low Capture Rate (1%)	Medium Capture Rate (8.5%)	High Capture Rate (15%)
Commuter and Recreational Trips (Daily)	25,000	250	2,100	3,800
Commuter and Recreational Trips (annual)	7,500,000	75,000	650,000	1,150,000
Intercity Trips to/from Markham and the rest of the Corridor (daily)	75	1	6	11
Intercity Trips to/from Markham and the rest of the Corridor (annual)	23,300	230	2,000	3,500

A station within Markham should not only be viewed as a benefit to the City of Markham, but also as an opportunity for the HFR project to better realize desired outcomes by attracting commuter and intercity demand. Benefits would be felt not only by Markham residents, but residents of all cities along the corridor through greater access to opportunities.

4.5.4 Benefit 11: Improved regional travel times and sustainability

What is the benefit?

This benefit illustrates how HFR can save time for commuters and intercity travellers by two mechanisms and the resulting environmental benefits of this:

- Reducing access time to railway service – where Markham HFR is easier to access than GO Rail or subway stations, customers may save access time
- Reducing time to Union or Eglinton – where HFR is faster than other modes to these destinations

How can an HFR station in Markham realize the benefit?

Table 4.3 outlines the potential time savings of the Markham HFR station for traveller types by mode and trip purpose.

Table 4.3: Potential Time Savings

Traveller Type	Potential Average Savings	How is the saving realized?
Auto Commuter	30 mins	Travelling by rail instead of by automobile
Transit Commuter	30 mins	Travelling by VIA instead of other transit services
Intercity Traveller	Up to 40 mins	Shorter access time to VIA at Markham than travelling to Union

With user travel time savings of up to 30-to-40-minutes a Markham HFR station could unlock connections to existing job and population nodes in the Greater Toronto Area that today are only accessible by car or a prohibitively lengthy trip by public transportation. These potential travel time savings for travellers in Markham as well as near the planned HFR station could unlock greater accessibility and opportunity for Markham’s growing population and job centres and vice versa.

In addition, these time savings will result in fewer people driving to get to their destinations, or trips with reduced auto access times. This will result in fewer cars on the road and vehicle kilometers travelled, leading to GHG reductions to the benefit of the local environment, and decongestion on the local road network to the benefit of increased productivity, as existing auto users will spend less time stuck in traffic. These benefits can be realized across the province and HFR corridor as the service will offer a one-seat connection to some of the nation’s largest cities, thus replacing auto trips that would have been made from Markham to those destinations.

A Markham HFR station should be viewed as a Union Station alternative for residents of not only York Region, but also adjacent regions (Peel, Toronto, Durham, Simcoe).

4.5.5 **Benefit 12: Provide rail service to a potential Pickering Airport**

What is the benefit?

This benefit is focused on expanding the ability of travellers to use rail to connect to airports as part of broader regional, national, and international mobility. Rail – either as a direct mode or combined with a first/last mile travel options – can provide customers with easy access to airports, while reducing congestion or potential risk of delays due to auto network disruption. An airport in Pickering has been discussed since the 1960s as a potential new airport to serve the Greater Toronto and Hamilton Area and the Greater Golden Horseshoe. This airport would be located in the Pickering Airport Lands, which are near the proposed Box Grove station location.

How can an HFR station in Markham realize the benefit?

Markham HFR station could serve the potential Pickering Airport within a 15-minute drive (by transit, taxi, shared mobility, shuttle, or car). This benefit is contingent on the successful completion of the Pickering Airport and potential direct transit connectivity via the proposed new transitways or shuttles.

4.6 **Strategic Case Summary**

Table 4.4 provides a summary of the strategic benefits of a Markham HFR station.

Table 4.4: Strategic Case Summary

Outcome	Benefit	Summary	Key Metrics
Outcome 1 – Enhancing Markham and York Region Economic Development	Benefit 1 – Providing new fast connections to employment centres	Connection to Markham’s growing employment hubs (technology, business, and manufacturing), could lead to greater economic productivity for the city and region.	<p>Adding new connections to Markham and York Region:</p> <ul style="list-style-type: none"> Markham to downtown Toronto with 15-to-30-minute travel time. Markham to Toronto’s Yonge-Eglinton Centre with 20-to-30-minute travel time. <p>Markham to Peterborough with 40-to-70-minute travel time.</p>
	Benefit 2 – Expanding talent that can easily access Markham and the surrounding York Region	HFR could facilitate reliable rapid connections to Markham as a net job importer for people who work in Markham but live outside its boundaries, and vice versa.	Serving nearly 40,000 jobs within a 5 km catchment of the proposed station (as of 2041).
	Benefit 3 – Growing the Region’s role as a knowledge centre and post-secondary destination	By increasing connectivity between Markham and Toronto, Ottawa, and Montreal, an HFR station in Markham would improve access to the future York University Markham Centre Campus and connections to Ontario and Quebec-based institutions in cities along the corridor.	Better connecting multiple post-secondary institutions between Ontario and Quebec
Outcome 2 – Supporting Urban Development	Benefit 4 – Supporting Markham secondary plans and development areas	HFR could increase connections to high-density development Secondary Plan areas, enabling access through non-auto travel.	Providing a new rail connection for up to 80,000 people who live within 3 km of the proposed station (as of 2041)
	Benefit 5 – Creating development opportunities in Box Grove	Should a HFR station be located at the Box Grove site, the neighbourhood could benefit from increased development potential through MTO’s transit-oriented communities policy.	Potential to deploy an HFR station as part of a new development program where station delivery is funded by a development third party.
	Benefit 6 - Supporting development of the Seaton Community and Northern Pickering	A HFR Station could provide rail access to planned development in Pickering via transit or a short auto trip	These communities are within 15 minutes by car. New transit connections could provide competitive transit connectivity between the station and the community, allowing Seaton residents to access Toronto, Ontario, and Quebec by rail.

Outcome	Benefit	Summary	Key Metric
Outcome 3 – Expanding Tourism	Benefit 7 – Supporting Destination Markham and Experience York Region	Markham’s allure as a destination for services, parks, trails, and cultural facilities could be enhanced with an HFR station increasing the catchment area for these attractions.	Expanding tourism opportunities for current 1.7 million tourists to Markham, while potentially attracting more tourists.
	Benefit 8 – Increasing access to and usage of Rouge National Urban Park and Other Major Destinations	The proposed Markham HFR station would neighbour Rouge National Urban Park and could enable increased park usage, supporting the significant investments made to the park as a natural attraction. It will also improve rail access to the Toronto Zoo and Toronto Pan Am Sports Centre.	Augmenting over \$140+ million investment in Rouge National Urban Park with expanded access.
Outcome 4 – Supporting the Success of High Frequency Rail and the Regional Transportation Network	Benefit 9 – Developing a ‘Union Station Alternative’ for easier access to VIA	A Markham HFR station would provide an alternative stop to Union station for customers outside of downtown Toronto, which could save travel time for VIA customers, reduce local traffic, auto emissions, and improve road safety by decreasing congestion on the road network.	Providing a station that is up to 30 minutes faster to access for 5 million residents than Union Station once open (assuming 2041 network)
	Benefit 10 – Growing the ridership of the HFR program	Expand the VIA HFR customer base across various customer types and markets along the corridor that otherwise would not be served by HFR or have difficulty accessing the system.	Opportunity for 250-3,800 new daily HFR trips by 2041.
	Benefit 11 – Improved regional travel times and sustainability	Significant travel time savings for commuters and inter-city travellers can be realised by the service, especially with an access point in Markham, leading to GHG emission reductions and road decongestion.	30-to-40-minutes time savings for travellers using the Markham HFR station
	Benefit 12 - Provide rail service to a potential Pickering Airport	An HFR station in Markham is well positioned to serve the proposed Pickering Airport by car as well as by potential transit expansions	The planned Pickering Airport would be located 15 minutes by car from the Markham Rail station.

5 Economic Case

5.1 Introduction

This chapter provides potential costs and benefits that could be generated by implementing a Markham HFR station and demonstrates the value that could be generated for travellers and the broader region. Economic performance assesses the value of resources required to deliver the Investment (costs) and the monetized value of the benefits the Investment can realize.

This chapter summarizes the economic benefit forecasting process, which assesses:

- The real value required to deliver HFR in terms of resource costs
- The level of benefits that can be realized by HFR across the project lifecycle (based on low, medium, high forecasted ridership levels)

5.2 Assumptions

Table 5.1 sets out the assumptions used to conduct economic analysis in this section. The focus of this analysis is calculating potential project costs and economic benefits, including Benefit Cost Ratio (BCR, benefits/costs) and Net Present Value (NPV, total benefits – costs) metrics for the Markham HFR station system over the life of the asset.

Table 5.1: Economic Case Assumptions

Factor	Assumption	Note/Source
Terms of analysis	Real Terms	All benefits/costs are expressed in real terms in 2022\$ and Appraisal begins in 2022
Discount Rate	3.5%/year	Capturing the time preference for value or money, as per the Metrolinx Business Case Guidance ²⁴
Road Safety Benefits (\$/km)	\$0.09	The benefit to society of mitigated collisions resulting in injury or death per reduction in automobile vehicle kilometres travelled, as per the Metrolinx Business Case Guidance
Environmental Value (\$/km)	\$0.01	The benefit to society of mitigated automobile emissions – including those that impact human health and those that contribute to climate change – per reduction in vehicle kilometres travelled, as per the Metrolinx Business Case Guidance
Decongestion Value Peak	0.01 hours/km	The benefit to society of reducing time spent in traffic for travellers who continue to use automobiles, as per the Metrolinx Business Case Guidance
Decongestion Value Off-Peak	0.00125 hours/km	
Vehicle Occupancy	1.2	The number of travellers per vehicle, as per Metrolinx best practice
Value of Time (2022)	\$19.86/hour	The value of each hour of travel time saved, as per Metrolinx Business Case Guidance
Auto Operating Cost Saving (\$/km)	\$0.04	The resource costs to operate a car for one kilometre, as per the Metrolinx Business Case Guidance
Analysis timeline	Construction + 30 years of service	Based on international best practice for assessing large-scale public transportation projects.
Cost Escalation	1% per year until 2062	Based on best practice, all capital and operating costs have real price escalation until 2062, thereafter no real increases

²⁴ Metrolinx Business Case Guidance (2021), <https://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/Metrolinx-Business-Case-Guidance-Volume-2.pdf>

5.3 Costs

Project costs for this analysis include capital costs to build the station and supporting infrastructure and operating and maintenance costs to stop at and maintain the proposed station.

5.3.1 Capital Costs

Capital costs are fixed, one-time expenses incurred during the construction of the station project. These costs include the labour and materials required for the site preparation and construction of the station including, but not limited to the station platform and building, landscaped areas, station access amenities such as pedestrian, bus and cycling infrastructure, parking lots, track work, as well as mechanical and electrical site services. Given the preliminary nature of this analysis and that the full scope of the station footprint and amenities are not known at this time, a range of capital costs were estimated to capture both a low-end cost (assuming a minimal build station), and high-end cost (to represent a station with full amenities and station access infrastructure). Based on regional station building practice, the range of estimated capital costs are \$25 – 83 million in present value terms over the 30-year evaluation period. A middle point of this estimated cost range is also assumed for a scenario within the analysis as well, with a capital cost value of \$54 million.

5.3.2 Operating and Maintenance Costs

This cost category consists of the costs required to maintain the station building and amenities and to operate the service at the new station stop. Given the preliminary nature of this analysis a range of costs were assumed for this category to capture a low, medium and high-end cost scenario. Based on regional station operating practice, Operating and Maintenance costs were estimated to total between \$7 – 9 million in present value terms over the 30-year evaluation period.

5.4 Benefits

5.4.1 Benefits Methodology

To forecast a range of potential outcomes, three ridership capture rate scenarios were assumed in the analysis. Referenced in section 4.5.3 of the Strategic Case chapter, the capture rates were identified from existing regional rail corridors to represent low, (1%) medium (8.5%), and high (15%) levels of demand for commuter trips and then were applied to forecasted VIA HFR service across the project lifecycle. These capture rates were then used to assess potential HFR benefits across the following categories:

- **Transit users** – existing transit users who can make use of VIA HFR services at Markham who would receive a benefit equal to the difference in their total travel time in the BAU compared to faster travel times using HFR from Markham (including changes in access time to the station and time on train)
- **Auto users who switch to rail** – travellers who drive in the BAU and switch to transit receive a benefit equal to the difference in travel time between the transit mode(s) they did not choose

in the BAU and improved travel times with VIA HFR at Markham (including changes in access times to the station and time on train) multiplied by $\frac{1}{2}$ (as per the rule of a half²⁵)

- **Automobile vehicle kilometres travelled benefits** – these benefits are based on the reduction in automobile vehicle kilometers travelled (vkt) for travellers in the GTHA (based on an average 25 kms per trip between Markham and Toronto in the 2016 TTS dataset) and is comprised of:
 - **Auto users who do not switch to VIA** – receive a decongestion benefit proportionate to the decrease in auto vkt. This benefit falls under the ‘Auto User Impacts’ benefit category
 - **Improved safety** – fewer road accidents due to mode shift from auto to transit (VIA). This benefit falls under the ‘External Impacts’ benefit category
 - **Reduced emissions** – fewer GHG emissions due to a shift of some motorists from auto to transit (VIA). This benefit falls under the ‘External Impacts’ benefit category

As the capture rate increases, more travellers take VIA HFR at Markham and benefit from reduced travel times, which increases user benefits. Increased capture rates also increase the auto vkt reduction along with all benefits associated with auto vkt.

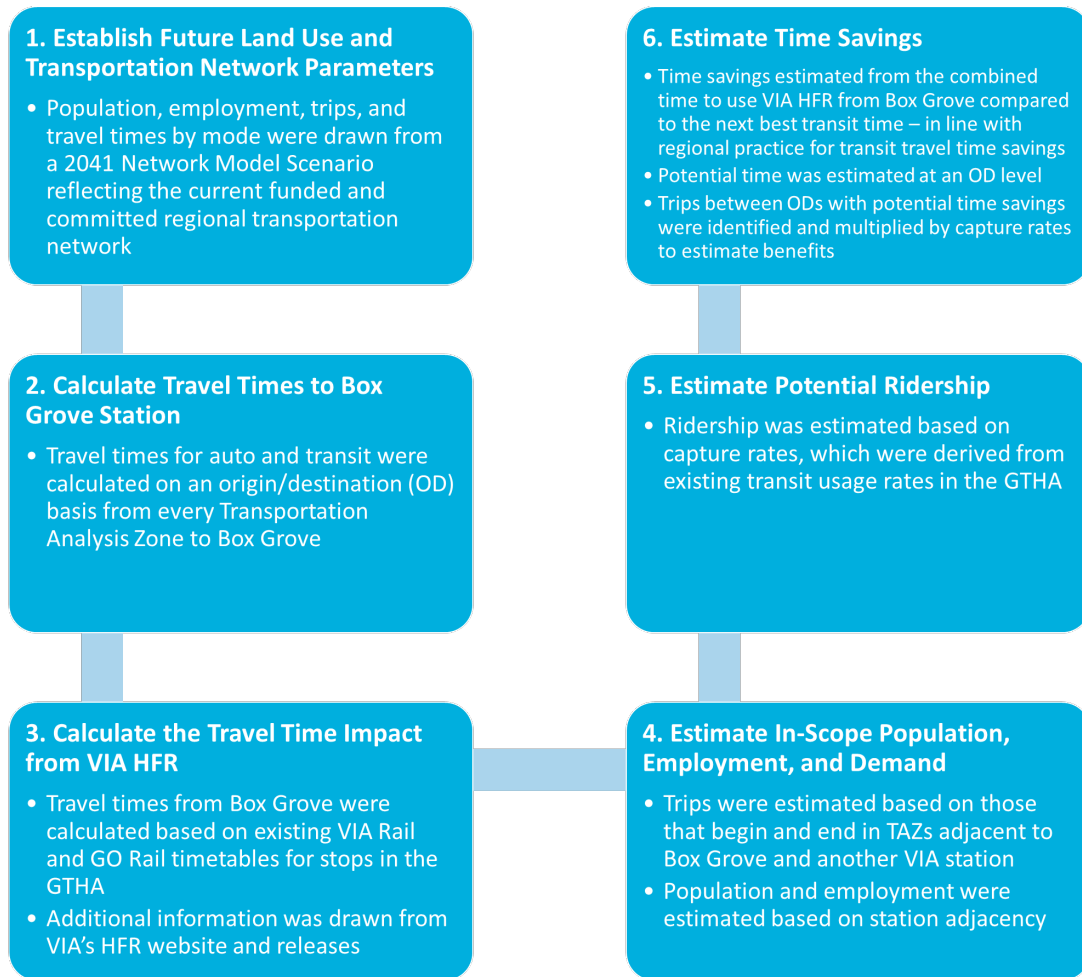
5.4.2 Benefit Calculation

A six-step process was used to assess the Box Grove Station’s potential benefits (see **Figure 5.1**). This process made use of Transportation Tomorrow Survey, 2041 Network Model Land Use/Travel/Network forecasts, and timetable data.

This analysis conducted is illustrative and is not based on forecasts from an investment grade model. The findings from this process are considered appropriate for an illustrative business case but should be supplemented with refined forecasting analysis if the project advances to further stages of development or business case analysis.

²⁵ Metrolinx Business Case Guidance (2021), <https://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/Metrolinx-Business-Case-Guidance-Volume-2.pdf>

Figure 5.1: Benefits Calculation Process



5.4.3 Benefits Potential

Total benefits are shown in **Table 5.2** for the three capture scenarios. Results show that across all capture rate scenarios the benefits to transit users and auto users are comparable. The time savings generated in both categories outweigh the value of improved road safety and environmental benefits in the External Impacts category.

Table 5.2: Economic Benefits Based on Capture Rate (2022 \$ Millions, Present Value)

Impact Type	Scenario 1 - Low Capture/Cost	Scenario 2 - Medium Capture/Cost	Scenario 3 - High Capture/Cost
Total Benefits	\$15	\$128	\$226
Transit User Impacts	\$6	\$51	\$90
Auto User Impacts	\$6	\$52	\$9
External Impacts	\$3	\$25	\$44

Note – all project benefits are illustrative and should not be used in the place of robust project specific forecasts.

5.5 Economic Case Summary

Once monetized and discounted, potential project benefits range from \$15 million in the low capture rate scenario to \$226 million in the high capture rate scenario. These potential benefits outweigh the capital and operating and maintenance costs to deliver the Markham HFR station under a medium and high capture rate scenario, but do not outweigh project costs in a low capture rate scenario. The analysis shows a BCR potential in the range of 0.5 – 2.5, meaning that for every dollar spent on the project the benefits to society could equal between \$0.50 and \$2.50 dollars. In order to deliver greater certainty on a BCR value above 1.0 future project analysis should refine the anticipated Markham HFR station capture rate (enabled by strong transit and auto connections, local mixed-use development and density and parking availability alongside a commuter friendly pricing structure) as well as certainty on project costs to deliver and operate the station (lower costs through a simple station design alongside strong cost overrun risk control measures being in place).

The NPV of the three scenarios range from $-\$17$ million to \$134 million showing that station costs would be recovered by benefits generated in a medium and high capture rate scenario. Excluded from this analysis are the potential fare revenues that could be generated from a Markham HFR station. Once project details, including potential pricing structure are better known, this information should be included in further refined benefit calculations thus leading to higher potential benefits relative to costs. **Table 5.3** summarizes the results of the Economic Case.

Table 5.3: Summarizing the Economic Case (2022 \$ Millions, Present Value)

Impact Type	Scenario 1 - Low Capture/Cost	Scenario 2 - Medium Capture/Cost	Scenario 3 - High Capture/Cost
Total Costs	\$32	\$62	\$92
Capital Costs	\$25	\$ 54	\$83
Operating and Maintenance Costs	\$7	\$8	\$9
Total Benefits	\$15	\$128	\$226
Transit User Impacts	\$6	\$51	\$90
Auto User Impacts	\$6	\$52	\$92
External Impacts	\$3	\$25	\$44
BCR	0.5	2.1	2.5
NPV	$-\\$17$	\$66	\$134

6 Deliverability and Operations Case

6.1 Introduction

The Deliverability and Operations Case provides an initial consideration of factors in the design and constructions of the station, the potential operating service through the station, and the further steps required before a station can be implemented.

This SBC assumes that the proposed station at Markham would be delivered as part of the overall HFR Project and that the alignment of the future HFR dedicated corridor between Toronto and Ottawa is similar to the existing single-track alignment between Toronto and Peterborough. Given the stage of project development, current project assumptions are high level and more detailed assumptions regarding operations and project scope will be required to support any future further business case work.

6.2 Project Delivery

6.2.1 Project Sponsors and Governance

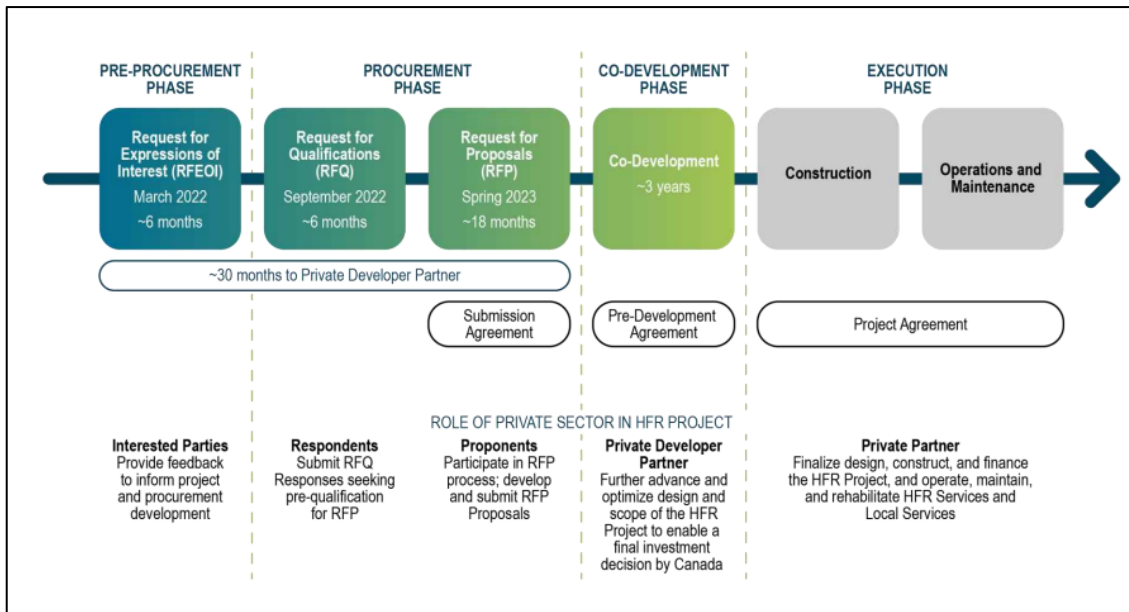
The proposed station at Markham would be on the proposed new dedicated HFR corridor between Toronto and Ottawa via Peterborough and would need to be delivered as part of the HFR Project.

As outlined in the Government of Canada's Request for Expressions of Interest (RFEOI), the HFR Project is planned to be delivered through an integrated delivery model between the Government of Canada and a Private Developer Partner. It is planned that the preferred Private Developer Partner would work with the Government of Canada during a Co-Development Phase to optimize design and scope of the HFR Project to enable a final investment decision by the Government of Canada.

Once the final design concept is approved, the HFR Project would move to the Execution Phase whereby the Private Partner would finalize the design, construct, and finance the HFR Project and operate, maintain, and rehabilitate HFR Services and Local Services.

Figure 6.1, "Overview of the HFR Project phases" is from the RFEOI and provides additional details on the four phases and the role of private sector in the HFR project.

Figure 6.1: Overview of the HFR Project phases

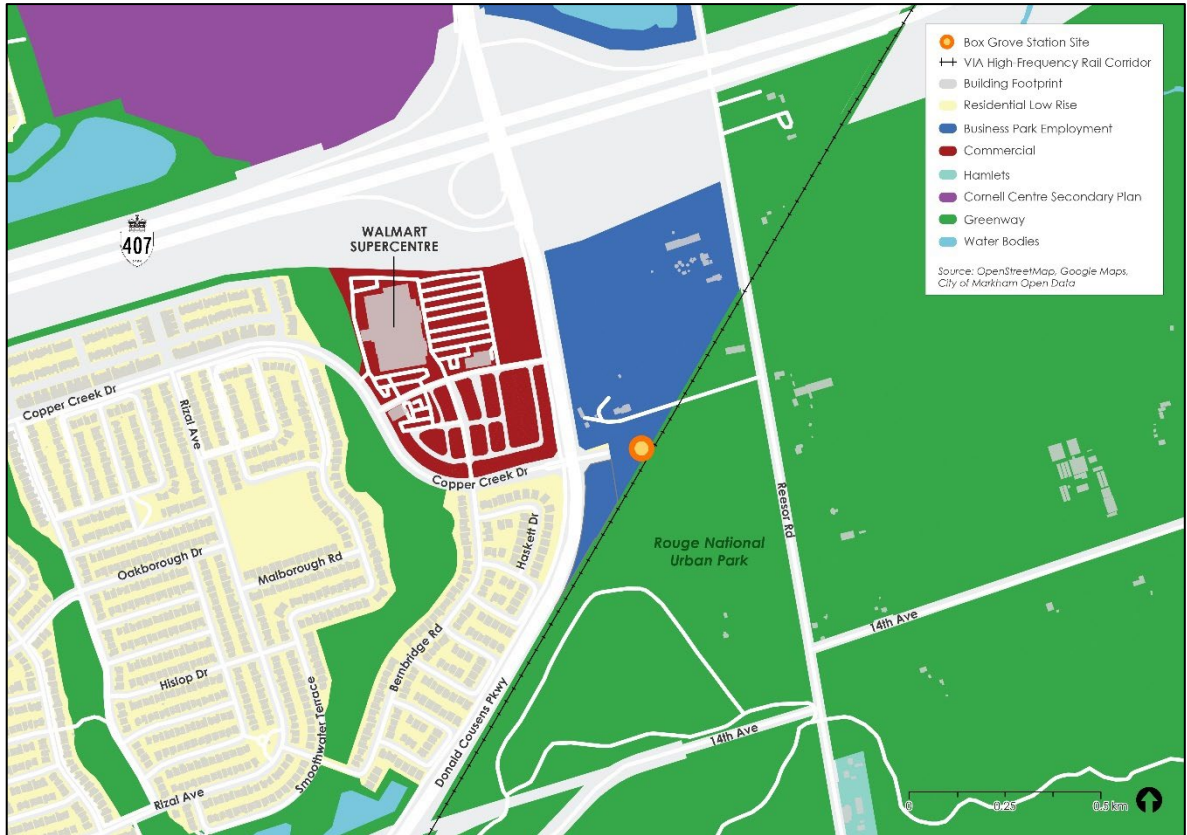


6.2.2 Constructability

Station Site

The proposed station location is on an undeveloped site that has the potential to provide ample space to accommodate construction as well as the required surface parking and station amenities. Station road access from Donald Cousens Parkway would need to be confirmed, but at this stage presents no significant risk. **Figure 6.2** details the potential footprint of the station relative to its immediate surroundings and existing land use.

Figure 6.2: Reference Station Potential Location



Track Infrastructure

The precise layout of the future station will be highly dependent on the future alignment of the dedicated HFR corridor between Toronto and Ottawa through Markham. The alignment of the dedicated HFR corridor is planned to be developed further during the Co-Development phase where design decisions on the alignment choices (double-tracking, curves and gradients). As such detailed station design would occur during this phase and should consider elements such as number of platforms, type of platforms (side v island platform), length of platforms, and signalling/track layouts.

6.2.3 Construction Impacts

The proposed site is located on the boundary of an urbanized area and Rouge National Urban Park, with the immediate area nearby the proposed site largely consisting of single-family homes. Further studies will need to be conducted to understand the impact of the station on existing property access, whether land acquisition is required and requirements for access to utilities.

There is potential for major impacts on the natural environment, however, these impacts would be no more or less than the local environment impacts that would be experienced as part of the overall HFR Project.

Environmental impacts associated with the new station should be further evaluated through more detailed study and consultation as part of the Co-Development and Execution phases of the HFR Project. There are existing regulatory processes in place to ensure these impacts are addressed. There are numerous mitigation measures available for addressing impacts; including noise walls, silt fences, dust suppression, and environmental monitoring.

Operating and Maintenance Plan

The detailed operating concept for the HFR Project is still to be developed. It is the expectation that the Private Partner will work with the Government of Canada during the Co-Development Phase to further develop key operational specifications such as journey times (operating speeds, track alignments), routes (express v stopping services), service offering (service frequency) and interface with existing corridor freight operations (if any). During the Execution Phase, it is the expectation that the Private Partner will have the ability, within the parameters of the HFR Project requirements, to set train schedules, rolling stock choice, fare strategies and service standards for new HFR Services and existing Local Services, operating the Corridor as an integrated network. However, it is expected that there will be certain minimum service requirements for operations in the Corridor that will be set by the Public Authority.

During the Co-Development Phase, decisions regarding minimum service levels at Markham and the impact of stopping on headline journey times need to be considered in detail. Further work is required to understand the potential demand at the proposed Markham station to determine future service levels, but at a minimum four trains per hour should connect Markham with Toronto and Ottawa with further daily direct services to Montreal and Quebec City to also be considered in the design of the operating concept for the Markham station and the overall HFR Project.

It is expected that the Private Partner would have responsibility for station maintenance once the station is operational.

6.3 Deliverability and Operations Case Summary

Overall, the proposed station is anticipated to have a feasible delivery if delivered as part of the overall HFR Project. The risks associated with construction impacts are anticipated to be no more or less on the local environment than the overall HFR Project.

7 Business Case Summary

7.1 Performance Summary

The addition of a passenger rail station in Markham on the Havelock Subdivision has been subject to past study and renewed municipal and regional interest, culminating in this Strategic Business Case. Identified in the analysis are the strategic benefit areas a HFR station in Markham could achieve, including:

- Providing new fast connections to employment centres;
- Expanding talent that can easily access Markham and the surrounding York Region;
- Growing the Region's role as a knowledge centre and post-secondary destination;
- Supporting Markham secondary plans and development areas;
- Creating development opportunities in Box Grove and Cornell;
- Supporting Destination Markham and Experience York Region;
- Increasing access to and usage of Rouge National Urban Park;
- Developing a 'Union Station Alternative' for easier access to VIA;
- Growing the ridership of the HFR program; and
- Improved regional travel times and sustainability.

The proposed station in the Box Grove neighbourhood would enhance connectivity to the regional rapid transportation network and enable fast and sustainable travel choices to major Canadian cities outside of the GTA while saving travel time for both transit and auto users in the regional transportation network.

The sum of forecasted economic benefits range from \$15 – 226 million, whereas potential project costs range from \$32 – 92 million, meaning that potential benefits outweigh costs under certain ridership capture rate scenarios, resulting in a BCR between 0.5 – 2.5 and a NPV of \$(17) – 134 million.

This analysis did not conduct a Financial Case analysis. As the HFR project scope is better understood in the coming years, a Financial Case analysis should be conducted in more detailed business case analysis.

Lastly, based on an initial scan of deliverability considerations it was determined that the proposed station location is less likely to present major construction or operational risks so long as the station facility remains on lands to the west of the rail corridor. Further study with an eye to deliverability and operational considerations will need to occur to confirm the initial findings of the SBC.

7.2 Next Steps

Based on this Strategic Business Case, Markham and York Region may continue to develop the station concept, including:

- More detailed preliminary planning to build upon the ‘pre-feasibility analysis’ conducted in this business case. This analysis would include more detailed site analysis and initial development of a station concept and operational plan;
- Developing integrated transit service and infrastructure plans to explore feasible improved connections to the station site; and
- Exploring co-development opportunities for mixed-use transit-supported communities adjacent or on top of the station site.

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