METROLINX

New Station Updated Initial Business Case, 2020

PARK LAWN

FINAL - April 22, 2020

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1. Introduction

1.1. Context

To maximize the benefits of the GO Expansion program, new stations are proposed to improve access to the GO rail network and generate new ridership. Stations should meet strategic, financial (affordability), economic, and deliverability and operational objectives without compromising the regional service objectives of GO Transit and its base of users.

1.2. Background

Provincial planning and policy initiatives call for significant operational changes in GO rail services in the Greater Golden Horseshoe (GGH). The GO Expansion program will bring more train trips to every GO rail corridor, including increased weekday rush-hour and non-rush hour periods, evenings, and weekends. By 2031, trains will run every 15 minutes or better, all day and in both directions, within the most heavily travelled sections of the network.

In 2016, an initial identification of over 120 potential station sites was narrowed to 56 through a high-level evaluation of transport connectivity, planning and land use, and technical feasibility. The 56 potential locations were then evaluated against 47 criteria, yielding 17 stations or clusters on corridors that would be suitable for major infrastructure investment as part of the GO Expansion program, to be evaluated in more detail using an Initial Business Case (IBC).

A potential station at Park Lawn Road was first examined in this original Initial Business Case process and was one of the 17 stations.

1.3. Previous Examinations

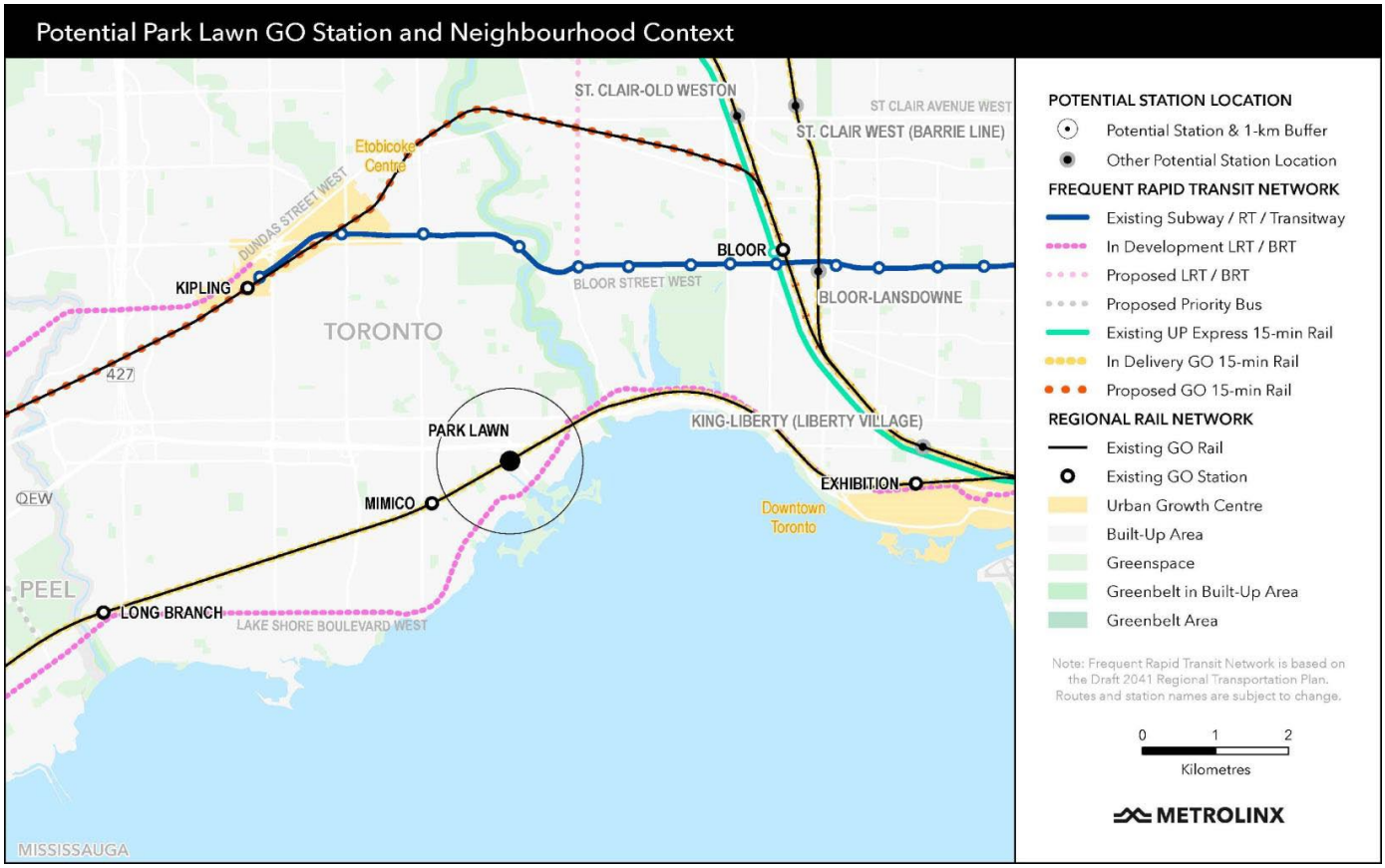
In July of 2016, the *Park Lawn and Mimico Initial Business Case* (*2016 IBC*) was completed. This IBC considered closing the existing Mimico Station if Park Lawn Station was opened due to their proximity (less than 2 km). For Park Lawn the IBC identified that substantial track work and reconstruction of the Gardiner Expressway overpass were required. It was also found that, while the station generated more ridership than Mimico, the negative impacts of closing Mimico and rebuilding the Gardiner Expressway overpass were not outweighed and so, it was determined the station should not advance.

After completing the *2016 IBC*, the *Updated Park Lawn Station IBC* (*Updated IBC, 2018*) was completed in February of 2018 in order to contemplate how the station performed with an alternative service scenario. The *Updated IBC, 2018* considered not replacing Mimico Station and, instead, using an alternating stop service for the stations. This would give the two stations half the local service as the rest of the Lakeshore West line. Additionally, the *Updated IBC, 2018* considered a concept that would not impact the Gardiner Expressway overpass by using two 8-car side platforms instead of two standard 12-car island platforms.

Part of the background work for the *Updated IBC, 2018* also examined a station to the east of the Gardiner Expressway. While this station had adequate spacing (greater than 2 km) from Mimico Station and better connectivity to the Humber Loop TTC local transit services, it performed poorly in several other regards. Notably, the station was difficult to access from the residential areas to the south, may have interfered with the existing Gardiner switching plant, and would not easily connect to the 2150 Lakeshore Boulevard West redevelopment site at the northeast corner of Park Lawn Road and Lakeshore Boulevard West. Station location and context can be found in **Figure 1** from the Updated IBC, 2018.

It was found that Park Lawn Station in the *Updated IBC, 2018* performed better than the *2016 IBC* and the most appropriate location for the station was adjacent to the 2150 Lakeshore Boulevard West development.

Figure 1: Potential Park Lawn GO Station location and context (from Updated IBC, 2018)



2. Problem Statement

The Problem Statement chapter of this Updated IBC provides a robust statement of the opportunity and a framework that supports option scoping and evaluation.

2.1. Problem Statement

Does a station located at Park Lawn Road and delivered through the Transit Oriented Communities (TOC) Program provide benefit to Metrolinx? If so, how many coaches should the station serve?

2.2. Scope and Purpose

The purpose of this report (*Updated IBC, 2020*) is to refine assumptions and information from the *Updated IBC, 2018*, producing a more thorough analysis of the station. Updates are largely related to cost estimates, service levels, required infrastructure, and modelling tools. Additionally, since the completion of the *Updated IBC, 2018*, Metrolinx has adopted the Transit Oriented Communities Program for the construction of new stations. The impact of this new procurement strategy is considered in this report, in terms of alternative funding and construction arrangements.

Much of the background context for the station still applies and can be found in the *2016 IBC* and the *Updated IBC, 2018*, available online. This Updated IBC has been developed for the sole purpose of analyzing benefits and costs of an investment in Metrolinx infrastructure.

2.3. Analysis Methodology

The Greater Golden Horseshoe Model (GGHM) version 4 regional travel demand model has been applied to support the assessment of the benefits and impacts for this new station site. This model is an improvement from the previously applied version 3 model in the *Updated IBC, 2018* as it has enhanced features and capabilities related to capacity, crowding and reliability for transit, demand management, and parking. Since the completion of the *Updated IBC, 2018* Metrolinx has fully transitioned to the use of GGHM version 4 for all major regional planning and rapid transit business case studies.

The Economic and Financial cases for the proposed new station depend on forecasts of how travelers will respond to the presence of the new station. This business case utilizes the same methodology that was applied for the *Updated IBC, 2018* for quantifying key benefits and impacts. This methodology is detailed in the *2018 GO Expansion RER New Stations Business Case Analysis Technical Report*.

2.4. Fare Integration

Two scenarios related to the 2018 discounted double discounted fare program for trips using both GO and TTC have been considered. The business as usual scenario (BAU Fare) assumes the 2018 double discounted fare ($1.50) for users transferring between GO and TTC while the Integrated Fare scenario assumes a full discount for riders transferring between GO to TTC. The integrated fare scenario assumes a future state where customers move seamlessly between services and do not need to worry about the operator of the bus or train that gets them to where they need to go within the city; consistent with the vision of the Metrolinx *2041 Regional Transportation Plan* (RTP).

2.5. Service Plan

As the *GO Expansion Full Business Case* is the most recent approved business case for service on the Lakeshore West corridor, its service levels are followed in this Updated IBC as per Metrolinx guidance. The *GO Expansion Full Business Case* outlines a potential service concept in 2031.

Compared to the *Updated IBC, 2018*, service at both Park Lawn and Mimico Stations is increased to 12 minutes in both directions, up from 30 minutes. It is expected that all local trains will be able to stop at both stations without incurring upstream rider travel time disbenefits. The net result of this change is a significant improvement in the performance of the station. A sensitivity test of this assumption is examined in **Appendix A**.

Elimination of the alternating-stop service examined in the *Updated IBC, 2018* was found to be possible due to timetable efficiencies related to local and express train operations articulated in detail in **Section 7.1**. This ability to serve both stations without upstream disbenefits is a unique opportunity related to the location of the station on the network; it is unlikely that many or any similar opportunities exist elsewhere.

It is also important to note that through the GO Expansion Program, the train operator will be obligated to provide service levels that should not leave passengers on the platform by 2031. Essentially, all riders who wish to use GO at that time will be able to do so. A sensitivity test has been completed in **Appendix B** that examines how ridership changes with an improved level of service to the station that may be more representative of a 2041 service. Additionally, increased service can serve as a proxy for improvements that may be made between 2031 and 2041 but are currently unfunded.

2.6. Land Use

The forecasted growth in population and employment across the region is a fundamental input to the Greater Golden Horseshoe Model's (GGHM) projections of future trip making and transit ridership. Over 3,000 traffic zones are used by the model to capture both the intensity and distribution of population and employment growth across the Greater Golden Horseshoe.

Population and employment at the traffic zone level have been updated to incorporate forecasts from the development application as an input to the model; this resulted in an increase in people and jobs forecasted for the development site compared to the *Updated IBC, 2018*. This is an important change relative to the *Updated IBC, 2018* as the results of this business case are contingent on the proposed density being approved by the City of Toronto.

The same land use has been assumed to be in place in the Base Case (without station) and both analysis options. This is a conservative assumption that allows for a consistent basis of comparison between scenarios to directly assess the performance of the station without conflating station performance with any development.

3. Investment Options

This chapter describes two investment options for consideration and evaluation in the Strategic, Economic, Financial and Deliverability and Operations Cases.

3.1. Context

Park Lawn Station is located on the Lakeshore West GO corridor in the City of Toronto. South of the rail corridor is the Humber Bay Shores neighbourhood that has experienced population growth in recent years and consists of medium to high-density residential buildings. The lands north of the corridor are a mix of commercial properties, the Ontario Food Terminal, and a low-rise residential neighbourhood north of The Queensway.

As part of the Transit Oriented Communities Program, the developer of the adjacent 2150 Lakeshore Boulevard West development (Developer) has expressed interest in delivering the station. The Official Plan Amendment application for the site was submitted to the City of Toronto on October 21, 2019 requesting conversion from Regeneration Areas to Mixed Use Areas and Parks and Open Spaces. This allows for a new GO Station to be integrated with an intensified mixed-use development of mid-rise and tall buildings.

This Updated IBC follows the Metrolinx *Business Case Guidance* and considers integration of the station within the 2150 Lakeshore Boulevard West development and delivery through the TOC Program. Outside of the TOC Program, Metrolinx has no existing plans to fund or construct the station.

3.2. Concept

A concept plan meeting business case requirements was provided to Metrolinx by the Developer for estimating and feasibility requirements only; as such, it is not included in this document. The concept was costed as per Metrolinx standards for new station construction. Final station designs and development integration will be determined through ongoing work in the TOC process. Additionally, site specific design development, including pedestrian flow modeling, will be required to establish access requirements within the site and to the platforms.

In principle, the station would span Park Lawn Road to allow access from both sides of the street for pedestrians and cyclists. Since the *Updated IBC, 2018*, the station alignment has also been refined to limit impacts to the Gardiner Expressway, existing signalling infrastructure, and the natural environment. Connections with TTC bus and streetcar routes are also contemplated and are subject to discussions between the Developer and the TTC.

3.3. Analysis Options

Two options are examined and compared against a Base Case in this business case. These options consider different length platforms to determine if standard length or shorter platforms are best suited for the station. Options were developed through consultation with Metrolinx subject matter experts.

The Base Case against which options are measured considers a business as usual scenario where no station is constructed. Service levels are derived from the November 2018 *GO Expansion Full Business Case* and are common between options. This service considers five local trains per hour serving the station in the AM Peak; four of which are 8-car electric multiple unit trains and the fifth is a 12-car electric locomotive consist. This service has been approved by the Metrolinx Board and is funded for implementation. While only an approved service plan can be examined in this Updated IBC, it is important to note that future service patterns can differ from the above to be more demand responsive, if necessary.

The *GO Expansion Full Business Case* considers service for the 2031 horizon year whereas this Updated IBC investigates the station in 2041. For the purposes of this Updated IBC, the 2031 service levels are being utilised for the 2041 horizon year since no other improvements have been committed at this time. However, it is likely

that service will evolve in the time between 2031 and 2041, improving headways and train capacity, but since these improvements are unknown they are not considered in this analysis.

Option 1 considers a station with full-length, 12-car platforms as per the *GO Design Requirements Manual* to examine a station built to standard Metrolinx specifications.

Option 2 considers a station with shorter than standard, 8-car platforms. This platform length was chosen as the doors on the existing fleet are operated from car five where the customer service agent (CSA) is located. Since the doors are operated by the CSA, allowable door options are: all 12 cars (1-12), 8 cars (5-12), or 5 cars (1-5). Due to the high ridership at the station and potential for customer impacts, a 5-car platform option is not examined in this study. Further details of the analysis options are presented in **Table 1**.

Table 1: Summary of investment options

	Base Case	Option 1	Option 2
Platform arrangement	N/A	Two side platforms	Two side platforms
Platform width	N/A	4.9 m	4.9 m
Platform length	N/A	315 m	210 m
Number of coaches served	N/A	12	8

3.4. Option 2 Refinement

To determine platform alignment for Option 2, two 8-car concepts were investigated; these are labelled as Option 2 and Option 2B in the following graphic.

Option 2B was excluded from the analysis due to impacts to the Gardiner switching plant and other operational issues. With the platforms aligned at the east end of where the 12-car platforms would be located, the trains need to enter the Gardiner switching plant to align the rear eight cars of the train with the platform. There are several operational implications of doing this:

- Loading and unloading passengers becomes dependant on the signal for the train to proceed. The train could appear "in the station" but not able to open doors, causing customer confusion.
- Operators would need to remember the signal given to them for the several minutes while they load and unload passengers. In situations with longer than normal dwells (i.e. due to an emergency alarm being pressed) the operators may forget the signal, creating a safety concern or further delay.
- With trains in the station, many of the switches in the plant would be locked out from use. This has the potential to interfere with both local and express train operations through the plant.
- Switch upgrades would need to be completed to ensure the proper logic is in place to prevent trains from entering occupied track.

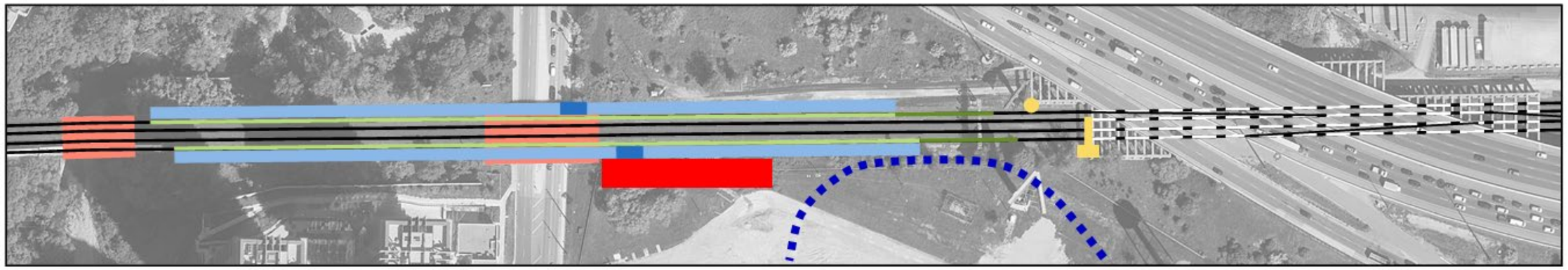
It is operationally not feasible to allow train locomotives to extend past the point where operators can see the signals. Practically, the furthest east the station can be located is where it is shown in Option 1 and Option 2.

A compliant Option 2B could conceivably be realized through relocation of the Gardiner switching plant further east. This was not examined in detail since an operation of this magnitude could take several years to complete with the limited work blocks on the Lakeshore West corridor. It would also require recommissioning of the signalling system; which may add another one or two years to the construction schedule. In all, this change could take upwards of five years to complete, delaying opening of the station into the late 2020's. Additionally, the cost of completing this work would far exceed the additional cost of constructing the full 12-car platform in Option 1.

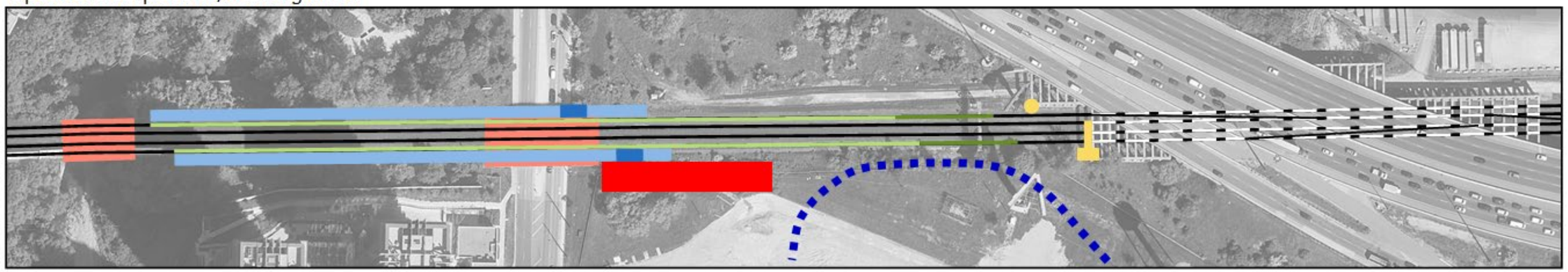
3.5. Option Illustrations

Illustrations of Options 1, 2, and 2B can be found on the following page.

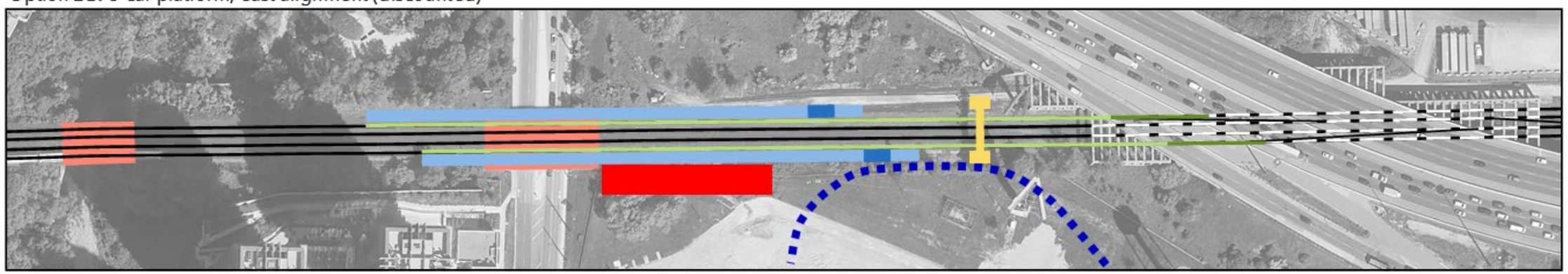
Option 1: 12-car platform



Option 2: 8 car platform, west alignment



Option 2B: 8-car platform, east alignment (discounted)



Legend

Track	Bridge	Station platform	Passenger coaches	Station building
Track under structure	Signal bridge	Mini-platform	Locomotives	Streetcar/bus ROW

4. Strategic Case

The Strategic Case summarizes the performance of each option against the strategic objectives to indicate if the investment supports the opportunity and broader policy and objectives.

4.1. Policy Alignment

Previous studies (*2016 IBC* and *Updated IBC, 2018*) have thoroughly examined policy alignment for this station; and are not being repeated in this Updated IBC. These studies found that the station generally supports local, Metrolinx, and provincial policy. The *2041 Regional Transportation Plan* (RTP) published late in 2018 was not examined in prior studies. The station is generally supportive of the RTP and its goals and strategies. The alignment is detailed in **Table 2**.

Even though implementation of the station would lead to overall reductions in greenhouse gas emissions and vehicle kilometres travelled, due to potential impacts to the Mimico Creek, the station may create some issues with the *Metrolinx Sustainability Strategy (2015-2020)* and the 2018 *Metrolinx Climate Adaptation Strategy* that should be examined in more detail during the Transit Project Assessment Process (TPAP) and design development. A summary of these policies is detailed below in **Table 2**.

Table 2: Station alignment with Metrolinx policy not previously examined

Policy Document	Section	Relationship
2041 Regional Transportation Plan	Strategy 2: Connect the Region	Through exceptional connection with local transit routes provided by the TTC this station has the potential to connect significant population centres to the Lakeshore West corridor. Additionally, the Bloor-Danforth Subway is only a short bus ride from the station and the station will be served by the future Waterfront West LRT.
2041 Regional Transportation Plan	Strategy 3: Optimize the System	The station considers integration with TTC bus and streetcar services in a common facility. Customers will experience a seamless transfer and both options were examined with fare integration and the double discounted fare.
2041 Regional Transportation Plan	Strategy 4: Integrate Transportation and Land Use	This station is envisioned to be delivered via the Metrolinx Transit Oriented Communities Program which allows for improved connectivity between nearby development and the station. Development plans submitted to the City of Toronto detail high-quality walk and bike infrastructure to the station and high density immediately adjacent to the station. This relationship enhances first and last-mile connections through shorter walk times and integrated bicycle facilities. No parking is proposed to be associated with the station.
2041 Regional Transportation Plan	Strategy 5: Prepare for an Uncertain Future	The site is adjacent to existing natural hazards associated with Mimico Creek that are projected to be exacerbated by climate change. The degree of current and future risk requires further assessment to support appropriate design and operational mitigation measures.

Policy Document	Section	Relationship
Metrolinx Sustainability Strategy	Goal 2, Action 2.2: Reduce greenhouse gas (GHG) emissions	Due to changes in travel patterns, implementation of the station would lead to an overall reduction in the emission of greenhouse gases through a mode shift towards transit from driving.
Metrolinx Sustainability Strategy	Goal 2, Action 4.1: Minimize the impact of new and existing infrastructure on ecosystems and consider ways to enhance the health of ecosystems (i.e., species, habitat, biodiversity)	The station may create complex impacts on stream geomorphology upstream, at the site, and downstream. Any potential impacts to natural features and required mitigation will be identified.
Metrolinx Sustainability Strategy	Goal 2, Action 4.2: Minimize and manage the use of salt and other chemicals used in operations that are dispersed in the environment	The use of salt on station platforms may introduce salt-runoff into the creek and surrounding ecosystem. Alternative operational methods will be examined.
Metrolinx Climate Adaptation Strategy	Key Action 2.1.3: Demonstrate how climate change is considered in the EA process and TPAP	Difficulties may arise for this station throughout the TPAP process as a result of its proximity to the Mimico Creek and the associated natural hazards.

4.2. Service Level

Both Option 1 and Option 2 assume a service concept where all local trains stop at both Park Lawn and Mimico Stations (technical rationale for this assumption is provided in **Section 7.1**). In previous examinations, this was not deemed feasible due to upstream impacts and operating challenges inherent to diesel locomotives. This change simplifies wayfinding for passengers disembarking at the station as they would not need to take subsets of local trains as was assumed in the *Updated IBC, 2018*. Furthermore, this change is supportive of the goals articulated in the *2018 GO Expansion Full Business Case* to provide 15 minute or better service to the core parts of the Metrolinx network. Having a service level this frequent at both Mimico and Park Lawn Stations means passengers in south Etobicoke no longer need to worry about missing a train and waiting up to 30 minutes for the next one; allowing for more flexible and adaptive lifestyles without personal motor vehicles.

4.3. Transit Oriented Communities Program

In December of 2018, Metrolinx adopted the Transit Oriented Communities Program to implement transit infrastructure that leverages the value of Metrolinx's transit network, service and real estate portfolio. This program involves the partnership between Metrolinx and a third party to deliver new or improved transit infrastructure wherein third parties will fund the design and construction of infrastructure and Metrolinx will operate it.

The Official Plan Amendment application submitted for the 2150 Lake Shore Boulevard West details a mixed-use development with towers up to 71 storeys in height. This type of development can generate a mix of people starting and ending their trips at the station throughout the day. With the proposed development directly integrated with the proposed GO station, TTC bus and streetcar infrastructure, and high-quality pedestrian and cycling links it is expected that both Option 1 and Option 2 will see a high proportion of ridership come from the development. The direct connections between high-density, mixed-use buildings can also help improve the wayfinding to the station, shorten access times, and allow for weather protection for the first and last-miles of customer journeys.

At the time of this Updated IBC, only the Official Plan Amendment for the development has been submitted to the City of Toronto. It is expected that further information will become available through the City-led Park Lawn Lake Shore Transportation Master Plan, secondary plan for the area, and further submissions from the Developer.

4.4. Customer Experience

Option 1 utilises the full-length GO platform and would not lead to any adverse customer impacts.

Option 2 utilises a shorter 8-car length platform which could generate confusion for some customers. Those alighting at Park Lawn would need to make sure they were not in one of the four coaches that would have door restrictions at the station. To avoid this, careful wayfinding and messaging from Metrolinx would be necessary. Contingency plans would also need to be in place to minimize the impact of customers who would mostly be alighting at Mimico or Exhibition Stations if they missed their stop.

4.5. Natural Environment

Mimico Creek is a dynamic system with both physical and ecological processes, including water moving through the stream corridor. The natural processes associated with flooding, valley slope instability, and stream erosion pose potential hazards to adjacent tablelands and infrastructure that could be exacerbated through construction, including retaining walls. As the frequency and severity of these hazards is also a product of current and future climate variations, they also represent climate vulnerabilities.

In both options, the location of the northern platform creates the potential that the Mimico Creek embankments, vegetation, and waterway will be disturbed during construction and operation of the station. During the Transit Project Assessment Process (TPAP) this should be investigated in more detail to explore platform design and construction techniques that minimize impacts on the natural environment and mitigate climate vulnerabilities.

All of these factors would have to be identified and mitigated through design and consultation with regulatory agencies. Studies and permitting required for different options may affect timelines and approval. Guidelines such as the *Crossings Guideline for Valley and Stream Corridors*, 2015 provided by the Toronto and Region Conservation Authority (TRCA) would be informative to assist with design development. A geomorphic study may also need to be completed to determine risks in the creek and to propose design solutions.

There is also a large tree located south of the rail corridor and east of Park Lawn Road that could be impacted by the station building under both options. Additionally, there are trees and vegetated areas that will likely be impacted by station construction on both sides of the corridor that should be investigated in the TPAP.

4.6. Multi-Modal Integration

Plans provided for the broader development at 2150 Lakeshore Boulevard West show changes to local TTC bus and streetcar services and close integration between the GO station and high density development. These plans were submitted as part of supporting documentation for the Developer's Official Plan Amendment.

Due to the platforms in Option 1 extending further east, transfers from the local transit routes become more convenient for customers. A weather protected transfer can be achieved in this option with a well-designed station site, further improving the customer experience. The platforms in Option 1 are also more accessible for the new residents and employees at the 2150 Lakeshore Boulevard West development as the eastern end of the platform runs along the northern edge of the site. It would be expected that customers who walk or cycle to the station would have shorter, more direct access trips leading to a more seamless journey.

In the case of Option 2, the platforms don't extend far enough east to connect with planned local transit facilities and the majority of the 2150 Lakeshore Boulevard West development. An additional walking distance in excess of 100 m would be required for these customers, creating a more disjointed journey and increasing overall trip times. For customers walking or biking to the station, there is a similar additional travel distance. Once the passengers are at the station, the only platform access is from the east end which can lead to crowding and a poor customer experience.

4.7. Strategic Case Summary

The station itself is supportive of local, regional, land-use, and transportation policies in the Humber Bay Shores areas as noted in the *Updated IBC, 2018*. Some issues related to the natural environment and the Mimico Creek should be further examined through the TPAP. As such, Option 1 and Option 2 both perform positively. Overall, Option 1 performs better than Option 2 given the better connectivity to the planned bus and streetcar infrastructure as well as reduced walk distances to reach the platforms. The case is summarized in **Table 3**.

Table 3: Summary of Strategic Case results

Strategic Case Parameter	Option 1 (12-car)	Option 2 (8-car)
Policy Alignment		
Service Level		
Transit Oriented Communities Program		
Customer Experience		
Natural Environment		
Multi-Modal Integration		
Overall Strategic Alignment		

Note: graphical summary is representative of the detailed analysis above

5. Economic Case

The following sections summarize the key economic benefits and impacts that are quantified in the analysis. Changes in this analysis from the *Updated IBC, 2018* include refined capital and operating cost estimates; a revised service plan; more detailed analysis of station requirements; updated land use near the station; updated modelling tools; and updates to the business case framework.

5.1. Assumptions

A 60-year project lifecycle was assumed for all Options with an operational year of 2024 for analysis purposes. Figures in this chapter are incremental to the Base Case and presented in real terms; totals are presented as Net Present Values (NPV) in 2019$.

5.2. Updated Cost Estimate

Previously completed capital cost estimates were completed at a high level and noted a degree of uncertainty surrounding the Park Lawn Road overpass and Mimico Creek bridge reconstruction work. Since the capital cost estimate can significantly impact the performance of the station, a more detailed examination was undertaken.

Since the *Updated IBC, 2018*, cost estimates for the station have decreased appreciably. This can be attributed to refinements in the platform alignment that eliminate impacts on the Mimico Creek Bridge and more detailed cost estimates with higher accuracy and thus a reduction in total contingency. Both Option 1 and Option 2 have benefitted from these revised estimates.

5.3. Economic Case Results

Categorizing ridership into new and existing users is required to calculate travel time in the Economic Case. The complexity of this categorization increases when considering assumptions used for stations impacted by fare integration. Metrolinx's updated *Business Case Guidance* (April 2019) suggests re-defining new versus existing riders to more accurately capture benefits.

Economic benefits are split into two categories: user impacts and external impacts. User impacts are benefits to the user of the investment while external benefits are benefits to society as a whole from an investment. User impacts include travel time savings when switching to GO from driving, auto operating cost savings, decongestion on the local road network, and fare revenues to Metrolinx. External impacts to society capture the health benefits of people taking transit, less driving leading to reduced auto emissions, and reduced accident rates on roads.

Ridership expected to be generated from the station is presented in **Table 4**; ridership is equivalent for both Option 1 and Option 2 as the additional four train cars in Option 1 are at or near capacity, so no theoretical increased passenger loading is realized. A sensitivity test was also completed that examines increased service on the Lakeshore West line; results for the test can be found in **Appendix B**.

A summary of the Economic Case is presented in **Table 5**.

Table 4: Ridership results summary

Ridership Period	Fare Scenario	
	BAU Fare	Integrated Fare
AM Peak Period (3 hr) Ridership (2041 Boardings + Alightings)	1,700	2,100
Daily Ridership* (2041 Boardings + Alightings)	4,800	5,900

*Daily Ridership determined from factoring of AM-Peak Period ridership

Table 5: Economic Case results summary (60-year lifecycle)

Economic Case Parameter	Option 1 (12-Car)		Option 2 (8-Car)	
	BAU Fare	Integrated Fare	BAU Fare	Integrated Fare
Benefit Cost Ratio (BCR)	**1.50**	**1.76**	**1.65**	**1.93**
Total Benefits (60yr lifecycle)	**$163 M**	**$191 M**	**$163 M**	**$191 M**
Travel Time Savings (Transit)	$118 M	$150 M	$118 M	$150 M
Travel Time Savings (Auto)	$9 M	$9 M	$9 M	$9 M
Vehicle Operating Cost Savings	$6 M	$6 M	$6 M	$6 M
Accident Reduction Benefits	$2 M	$2 M	$2 M	$2 M
Environmental Benefits	$0.6 M	$0.6 M	$0.6 M	$0.6 M
Incremental Fare Revenue	$28 M	$24 M	$28 M	$24 M
Total Costs	**$108 M**	**$108 M**	**$99 M**	**$99 M**
Capital Costs	$96 M	$96 M	$86 M	$86 M
Operating Costs	$13 M	$13 M	$13 M	$13 M

5.4. Economic Case Summary

From an economic perspective, the station performs well under both options, producing benefits that significantly outweigh the costs. Option 2 also performs marginally better than Option 1 due to the lower capital cost outlay required for the shorter platforms. Fare integration also further improves the case for the station due to higher ridership, but also yields a net reduction in the incremental fare revenue due to the subsidization of transfers to the TTC.

6. Financial Case

The Financial Case assesses the overall financial impact of proposed investment options. While the Strategic Case and Economic Case outline how an investment achieves organizational goals and social value, the Financial Case is one of two cases (the other being the Deliverability and Operations Case) that focuses on the requirements to successfully deliver an investment. Typically, this includes a review of the total changes and year over year change in revenue and expenditure over the lifecycle of the investment.

The Financial Case is different from the Economic Case in that it does not consider society-wide benefits of an investment. Instead, the Financial Case focuses on the financial resources required to implement the investment and the cash flow impact for Metrolinx or the party responsible for the investment.

6.1. Assumptions

Dollar figures for the 60-year evaluation period are in nominal dollars (i.e. the dollar figure expected to be paid or received expressed in the year of the payment). Nominal dollars are calculated assuming an annual inflation rate of 2%. The annual costs and revenues are discounted back to a single value using a nominal discount rate of 5.5%. Once discounted, total costs are compared against incremental revenues to derive the net present value in 2019$.

6.2. Exclusion of Capital Cost

Since the Financial Case only considers costs to Metrolinx, the capital cost for constructing the station has been excluded from consideration. This is due to the station being constructed by, and at the cost of third parties through the TOC Program. This cost is included in the Economic Case since it is still a cost borne by society as a whole to implement the station.

Similarly, risks related to the environmental features of the Mimico Creek have not been quantified as a cost for the station. A more exhaustive review of these risks and the costs associated with them needs to be undertaken as the design progresses.

6.3. Financial Case Summary

In the Financial Case, Option 1 and Option 2 perform identically since the only differentiator, the station capital cost, is excluded. Both options perform strongly with high ratios of revenue to cost and operating cost recovery (both are equivalent due to the zero capital cost). These metrics are 2.18 for the BAU Fare scenario and 1.85 for the Integrated Fare scenario for both Option 1 and Option 2; representing a net reduction in Metrolinx operating expenditures. The net present value of the station also suggests that this is a strong investment from the perspective of Metrolinx; $15 M for the BAU Fare scenario and $11 M for the Integrated Fare scenario for both Option 1 and Option 2.

The BAU Fare scenario does have a slightly better performance than the Integrated Fare scenario even though the Integrated Fare Scenario generates higher ridership. This is due to the increased ridership not being enough to offset the subsidy for transfers from the TTC.

A summary of the Financial Case can be found in **Table 6**.

Table 6: Financial Case results summary (60-year lifecycle)

Financial Case Parameter	Option 1 (12-Car)		Option 2 (8-Car)	
	BAU Fare	**Integrated Fare**	**BAU Fare**	**Integrated Fare**
Incremental Fare Revenue	$28 M	$24 M	$28 M	$24 M
Capital Costs*	$0	$0	$0	$0
Operating Costs	$13 M	$13 M	$13 M	$13 M
Net Present Value	$15 M	$11 M	$15 M	$11 M
Revenue to Cost Ratio	2.18	1.85	2.18	1.85
Operating Cost Recovery Ratio	2.18	1.85	2.18	1.85

*Capital costs for the station in the Financial Case are $0 as it is being delivered by a third party developer at their own cost.

7. Deliverability and Operations Case

The Deliverability and Operations Case provides evidence of the ease of constructing the station, operating service through the station, and the further steps required before a station can be implemented. This case also outlines the project risks known at this stage, such as disruption during construction and potential operating changes that affect the performance of the station. For the purposes of this report, the station was assumed to be under construction from 2021 to 2024 with operations beginning in 2024.

7.1. Stopping Pattern

Previous studies have considered service to Park Lawn at the expense of Mimico GO being decommissioned or having reduced service. In these instances, upstream impacts to riders were not realized since the stop did not add extra journey time. It is now assumed that a service pattern can be achieved with electrified trains where both Mimico and Park Lawn Stations can be served with full local service and no or limited impacts to upstream riders.

To meet future service requirements on the Lakeshore West corridor, express trains (eastbound in the AM and westbound in the PM) need to overtake local trains before the track reduction at Canpa, west of Mimico Station and Willowbrook Yard. Practically, this means that the overtaking will need to occur between Exhibition and Mimico Stations to not impact Willowbrook operations.

If Park Lawn Station did not exist, it is expected that a number of services, especially counter/off-peak, would require additional scheduled buffer time of 1-2 minutes to mitigate against conflict and make the schedules robust, particularly in the westbound direction. Dwell times at Exhibition and Mimico Stations plus the additional 1-2 minutes of buffer would provide the minimum required reliable time for this to occur. In the case without Park Lawn Station, trains would dwell for longer at the two existing stations or wait mid-line for a signal to proceed.

If Park Lawn Station was opened, the buffer in the schedule would be satisfied by the additional time required to stop. Meaning that, the travel time between the Union Station Rail Corridor (USRC) and Canpa would be unchanged in either scenario. Due to this, it is not necessary to assign upstream travel time penalties to Park Lawn Station since the overall trip time for upstream passengers would be unchanged with or without the station.

This assumption is unique to the station being located between the USRC and Canpa where the Lakeshore West tracks are reduced to three from four. It is unlikely this assumption will hold in any other areas of the Metrolinx network.

This benefit is not realised by diesel locomotives due to their slower acceleration not requiring additional dwell times from local trains. A sensitivity test has been conducted in **Appendix A** to examine how the station performs with a full penalty assigned, as would be the case with diesel-only service.

7.2. Signal Infrastructure

Both options require modifications to the signal bridge on the west end of the Gardiner switching plant to allow the platforms to be constructed without impacting the Mimico Creek Bridge. Constraints for this include:

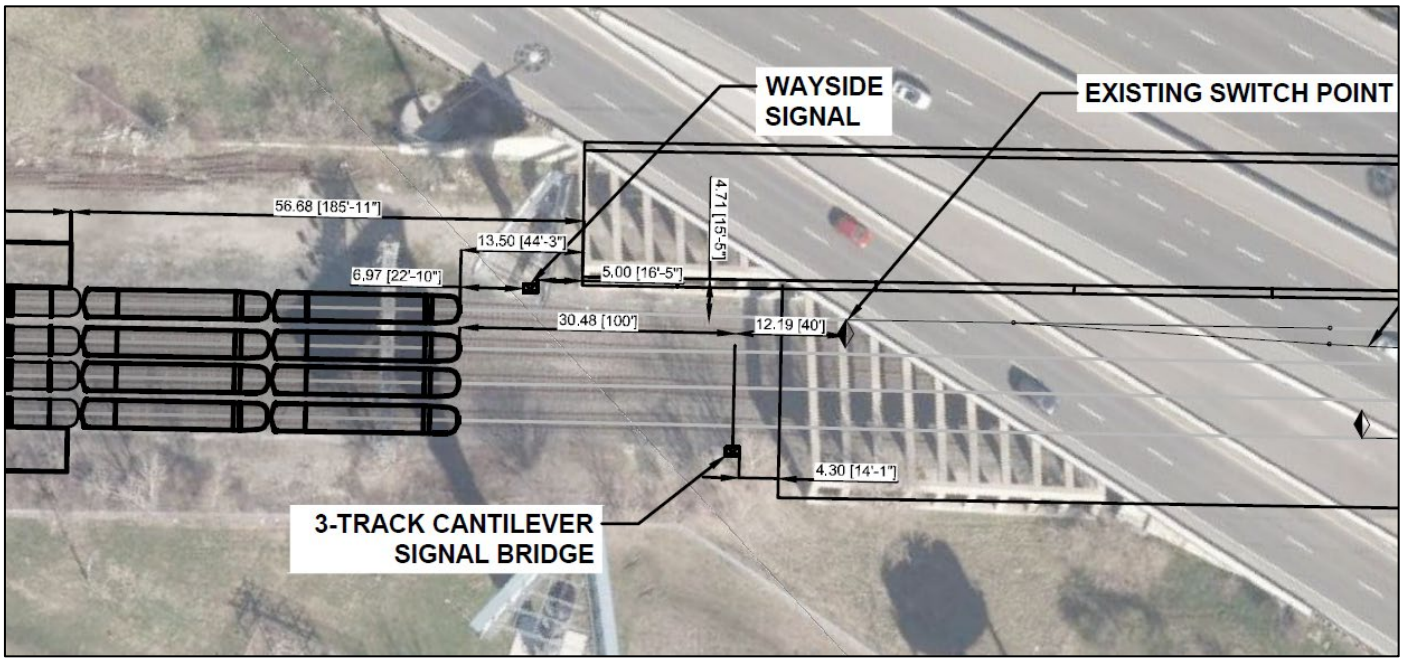
- The signal needs to accommodate two locomotives on the east end of the train as per normal Lakeshore West operations during locomotive commissioning;
- Distances as per *GO Transit Signals and Communications Standards Costs of Practice*, October 2019 (RC-0506-03SIG-02);
- Signal foundations and structure should not impact the existing Gardiner Expressway Structure; and
- Modifications of the Gardiner switching plant should be avoided.

A potential design has been produced that meets the above criteria without impacting the Mimico Creek Bridge. This design utilizes a cantilevered overhead signal that controls the southern three tracks and a wayside signal post that controls the northern track. With this arrangement, a separation of between 7 and 9 metres between the west end of the platforms and the Mimico Creek Bridge can be achieved.

Further study should be completed to determine how installation and commissioning would proceed. From a preliminary examination, it appears as though this arrangement is feasible to construct and commission and could be completed in a weekend if the work was undertaken when the corridor was closed for other maintenance or construction. This can also proceed in advance of the rest of the station if there is a suitable weekend closure sooner.

A detail of the signal arrangement is shown in **Figure 2**.

Figure 2: Proposed signal arrangement at Park Lawn Station



*Platforms shown are for Option 1. However, the trains stop in the same location for both options so the signal alterations are identical.

7.3. Bridge Impacts

Both Option 1 and Option 2 are anticipated to require modifications to the Park Lawn Road overpass to accommodate one or both platforms; this is largely attributable to widening required but also includes some conduit relocation and other structural changes.

The existing rail overpass at Park Lawn Road is of a concrete ballasted type constructed in 1973. There is a conduit duct running on the outside of the south wall. Since the platforms span Park Lawn Road, there will need to be extensions or separate stand-alone bridges immediately adjacent to the existing structure constructed. Widening the bridge or adding new structures immediately adjacent to the existing span represents a significant proportion of the overall cost for the station. Impacts to conduit should be examined further to ensure they can be accommodated or rerouted in the final design. On the south side of the tracks there appears to be several meters of space on the bridge deck where the platform may be able to be accommodated; this should be examined in more detail through detailed design as using this space could generate significant cost savings.

The last bridge condition assessment was completed over May and June of 2015. At this time, there were no repair concerns noted for the bridge. It is probable the bridge would still be considered to be in good condition today; a full replacement of the bridge is likely unnecessary.

7.4. Rail Operations

Option 1 utilizes two 12-car side platforms in conformance with existing train operations. This allows for a more consistent customer experience and does not require door restrictions from the train.

Due to the reduced platform length in Option 2, permanent door restrictions would be required at the station so long as 12-car trains were being operated; similar to the current case when a platform has ongoing construction. At a minimum, the CSA on the train would need to announce on every local Lakeshore West train that doors on cars 1-4 will not open at the station. While this is tolerable for temporary conditions today, given that this would be a permanent condition, there may need to be a more permanent solution. This could take the form of painting or signing platforms at Union Station to note where the loading area for Park Lawn GO would be. Since the station is expected to generate a significant amount of alightings as well, this may need to be extended to other stations on Lakeshore East and West if it becomes an issue. The shorter platforms would also likely require longer dwell times at the station to allow for people to walk through the train and alight. While this time has not been considered in this assessment, it would negate much of the benefits described in **Section 7.1** and would result in significant upstream delays to passengers with similar consequences to station performance as is found in the sensitivity test in **Appendix A**.

7.5. Train Capacity

With the service plan outlined in the November 2018 *GO Expansion Full Business Case* and projected ridership growth, it is expected that the trains arriving at Park Lawn Station may have limited passenger capacity in 2041 to serve all potential customers; this is the same for both Option 1 and Option 2.

Modelling outputs suggest this is a line-level issue and not related directly to the station since the local trains reach capacity in the eastbound direction during the AM peak at Clarkson GO Station. Displaced riders at the station were found to predominantly use the TTC as their alternative access mode.

As previously noted, through the GO Expansion Program, the train operator will be obligated to provide additional service that does not leave passengers on the platform, if required. Therefore, during actual operations, this constraint should be minimized or eliminated. As such, a sensitivity test has been completed in **Appendix B** that examines how the economic and financial cases change with an improved level of service to the station that may be more representative of a 2041 service.

7.6. Delivery Mechanism

Both Option 1 and Option 2 are expected to be delivered and funded by a third party through Metrolinx's Transit Oriented Communities Program. The upside of this approach is an overall reduction in risk and capital cost for Metrolinx. However some control is given to the third party with respect to station design and integration as well as timing for opening. While risk for these can be minimized through the Metrolinx Asset Protection Package that is internally developed, there is still some inherent risk. Additionally, if the overall development is cancelled or delayed it could jeopardize implementation of the station.

Since the station is not being constructed by Metrolinx or another crown agency, permits that Metrolinx would normally not obtain will likely be required. Notably for this station, approvals from the TRCA may require

extensive due diligence, hydrogeotechnical, species at risk, and watercourse studies to be completed, among others. Protection for impacts related to climate change such as bank erosion, flooding, and habitat change should also be examined.

The consequence of these risks is a return to business as usual in the absence in other funding streams.

7.7. Deliverability and Operations Case Summary

Due to the station's unique location, all local trains are able to service the station without incurring an upstream travel time penalty for passengers. This operational benefit supports the implementation of both Options 1 and 2. However, both options require alterations to the Park Lawn overpass as well as the western signal bridge of the Gardiner switching plant. The options are further differentiated by the passenger capacity since Option 1 can load to 50% more coaches assuming there is capacity available on the train. Due to the high ridership expected at the station and conformance to standard operating procedures, Option 1 performs better than Option 2 in the Deliverability and Operations Case. A summary of the case can be found in **Table 7**.

Table 7: Summary of the Deliverability and Operations Case

Deliverability and Operations Case Parameter	Option 1 (12-car)	Option 2 (8-car)
Stopping Pattern		
Signal Infrastructure		
Bridge Impacts		
Rail Operations		
Train Capacity		
Delivery Mechanism		
Overall Deliverability and Operations Alignment		

Note: graphical summary is representative of the detailed analysis above

Appendix A: Dwell Time Sensitivity Test

This sensitivity test was completed to determine the impact if the assumption outlined in **Section 7.1** (stopping all local trains at both Mimico and Park Lawn Stations without assigning an upstream penalty) does not hold true. To do so, a 1.5 minute delay was assigned for all local trains stopping at the station. Ridership results are unchanged at Park Lawn GO as only upstream riders would be impacted by this change; these are presented again in **Table A1**; the Strategic and Deliverability and Operations cases are also not impacted from this change. Economic and Financial results for this analysis are presented below in **Table A2** and **Table A3**.

As can be seen below, the inclusion of a dwell time penalty significantly impacts the performance of the station.

Table A1: Dwell time sensitivity ridership results summary

Ridership Period	Fare Scenario	
	BAU Fare	Integrated Fare
AM Peak Period (3 hr) Ridership (2041 Boardings + Alightings)	1,700	2,100
Daily Ridership (2041 Boardings + Alightings)	4,800	5,900

*Daily Ridership determined from factor of AM-Peak ridership

Table A2: Dwell time sensitivity economic results summary (60-year lifecycle)

Economic Case Parameter	Option 1 (12-Car)		Option 2 (8-Car)	
	BAU Fare	Integrated Fare	BAU Fare	Integrated Fare
Benefit Cost Ratio (BCR)	**All Loss**	**All Loss**	**All Loss**	**All Loss**
Total Benefits (60yr lifecycle)	**-$9 M**	**-$24 M**	**-$9 M**	**-$24 M**
Travel Time Savings (Transit)	-$31 M	$1 M	-$31 M	$1 M
Travel Time Savings (Auto)	$8 M	$8 M	$8 M	$8 M
Vehicle Operating Cost Savings	$5 M	$5 M	$5 M	$5 M
Accident Reduction Benefits	$2 M	$2 M	$2 M	$2 M
Environmental Benefits	$0.5 M	$0.5 M	$0.5 M	$0.5 M
Incremental Fare Revenue	$7 M	-$40 M	$7 M	-$40 M
Total Costs	**$133 M**	**$133 M**	**$123 M**	**$123 M**
Capital Costs	$96 M	$96 M	$86 M	$86 M
Operating Costs	$37 M	$37 M	$37 M	$37 M

Table A3: Dwell time sensitivity financial results summary (60-year lifecycle)

Financial Case Parameter	Option 1 (12-Car)		Option 2 (8-Car)	
	BAU Fare	Integrated Fare	BAU Fare	Integrated Fare
Incremental Fare Revenue	$7 M	-$40 M	$7 M	-$40 M
Capital Costs*	$0	$0	$0	$0
Operating Costs	$37 M	$37 M	$37 M	$37 M
Net Present Value	-$30 M	-$77 M	-$30 M	-$77 M
Revenue to Cost Ratio	0.18	< 0	0.18	< 0
Operating Cost Recovery Ratio	0.18	< 0	0.18	< 0

*Capital costs for the station in the Financial Case are $0 since it is being delivered by a third party developer at their own cost

Appendix B: Increased Service Sensitivity Test

This sensitivity test was completed to determine the effect additional train service would have on station ridership given service levels as per the *GO Expansion Full Business Case* showed some capacity constraints on Lakeshore West trains. Details of the service plan used in this sensitivity test are not presented as this is a representative exercise that does not correlate to any planned or funded commitment on the corridor. However, the service is technically feasible to implement on the corridor and is not outside of the realm of possibilities for what could be implemented by 2041.

Rationale for this sensitivity test stems from two main considerations:

- Firstly, the *GO Expansion Full Business Case* service plan was developed for a 2031 horizon year while modelling for Park Lawn GO considers a 2041 horizon year. Having an increased service sensitivity can serve as a proxy for improvements that may be made between 2031 and 2041 but are currently unfunded.
- Secondly, due to the nature of the GO Rail Expansion On-Corridor procurement, it is unknown what the actual service plan for the Lakeshore West corridor will be until the contract is awarded. What is known is that the operator will need to provide enough train capacity for any customers who would like to use GO. Therefore, a service plan that reduces the capacity constraints discussed in **Section 7.5** may help illustrate the broader potential for ridership at the station.

Results of the sensitivity test show that with increased service to the station ridership significantly increases. This increase is largely attributable to the increased train capacity and only partially from induced demand due to increased attractiveness to customers. **Table B1** below summarizes the potential for ridership at the station in 2041 with the representative increased service.

Table B1: Increased service sensitivity test (incremental ridership shown in brackets)

Ridership Period	Fare Scenario	
	BAU Fare	**Integrated Fare**
AM Peak Period (3hr) Ridership (2041 Boardings + Alightings)	2,600 (+900)	3,200 (+1,100)
Daily Ridership* (2041 Boardings + Alightings)	7,200 (+2,400)	8,800 (+2,900)

*Daily Ridership determined from factoring of AM-Peak Period ridership

Appendix C: Financial and Economic Analysis Assumptions

The following assumptions are in accordance with Metrolinx's Business Case Guidance (2019).

Table C1: Model Input Assumptions

Model Input Assumptions	Metric	Notes
Project Evaluation Period (Years)	60	Analysis period ends in 2083
Year of Cost Estimates	2019	Per cost estimate
Annual inflation rate – General Price Level	2%	Metrolinx Business Case Guidance
Annual Inflation Rate – Construction Spending	3%	Per cost estimate
Ridership Daily Factor (from Peak Period)	2.8 – 3.85	Varies by station service level and context
Ridership Annualization Factor (days/year)	280	Annualizes weekday forecasts
Discount Rate, Nominal (%)	5.5%	Metrolinx Business Case Guidance
Construction Period (start and end dates)	2021-2024	Construction timeline
Discount Rate, Real (%)	3.5%	Metrolinx Business Case Guidance
Value of Time ($/hr) (2019$)	$18.06	/w 0% Value of Time Growth Rate. Metrolinx Business Case Guidance
Value of Time Annual Growth Rate, Real (%/year)	0%	Metrolinx Business Case Guidance
Auto Operating Cost ($/VKT) (2019$)	$0.09	Metrolinx Business Case Guidance
Auto Operating Cost Growth Rate, Real (%/year)	0%	See Metrolinx Business Case Guidance
Decongestion on Road Network (Hours per VKT)	0.01	/w 0% Value of Time Growth Rate. Metrolinx Business Case Guidance
Decongestion on Road Network Growth Rate, Real (%)	0%	0.75% used as sensitivity test. Metrolinx Business Case Guidance
Accident Reduction Benefit ($/VKT) (2019$)	$0.1	Metrolinx Business Case Guidance
Accident Reduction Growth Rate (%/year)	-5.3%	Metrolinx Business Case Guidance
Greenhouse Gas Emission (GHG) Costs in CO2e ($/VKT) (2019$)	$0.01	Metrolinx Business Case Guidance
Greater Golden Horseshoe Model (GGHM) Forecast Year	2041	GGHM forecasts for 2041 AM peak period
Ridership annual growth rate – Lakeshore West (%)	1.9%	GGHM background growth rate

Appendix D: Ridership Inputs and Results Summary

Table D1: Modelled Service Levels: AM Peak Trains Serving the Station (Inbound to Union)

Description	Value	Unit
Frequency	5	Number of trains per hour
Headway	12	Minutes between trains
*Note: **This is not a service plan**. These service levels have been assumed for modelling purposes only. The full service plan for GO Expansion will be defined by bidders as part of the GO Rail Expansion On-Corridor procurement process.*		

Table D2: Travel Time Impact of Station

Description	Value	Unit
Travel Time Impact	0	Minutes
Note: Effectively no net impact since travel times on Lakeshore West are unchanged with and without a station at this location due to track constraints west of Mimico and assuming electrified service.		

Table D3: Ridership Breakdown – 2041 Daily Trips by New GO Riders

Description	Fare BAU	Fare Int.	Unit
Daily Trips by New GO Riders	900	900	Trips (ons + offs)
Daily Trips Lost Due to Upstream Delay	0	0	Trips (ons + offs)
Total Daily Trips	900	900	Trips (ons + offs)
Note: New GO Riders are defined as new station users that choose to switch to use GO when Park Lawn Station is in place. The remaining trips at the station are made by riders that would have otherwise used Mimico GO or another GO station. In addition to the new GO riders that are attracted to each new station, Net New GO Riders also considers the riders that choose to no longer use the GO system.			

Table D4: Ridership Breakdown – Boardings and Alightings

Description	Fare BAU	Fare Int.	Unit
2041 AM Peak 3 hr Boardings	1,000	1,300	Trips (ons)
2041 AM Peak 3 hr Alightings	700	800	Trips (offs)
2041 Daily Trips	4,800	5,900	Trips (ons + offs)