

Simcoe Street Initial Business Case Update

December 2024



Simcoe Street Initial Business Case Update | FINAL and CONFIDENTIAL

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Executive Summary

Scope

This document is the Initial Business Case for the Simcoe Street Rapid Transit Project. It evaluates options for rapid transit investment along the Simcoe Street corridor. The corridor is shown in **Figure Exc.1** spanning Highway 407 in the north to Lakeview Park in the south, all within the City of Oshawa and the Region of Durham.

The Simcoe Street corridor is the only north-south transportation spine in the city that directly serves Downtown Oshawa, multiple key commercial and mixed-use areas and educational destinations. As of 2021 it was home to approximately 75,200 people and 27,400 jobs within 1 kilometer of the corridor. These totals represent 42% of Oshawa's population and 51% of jobs and 13% of jobs in the region, showing the strategic and economic importance of the corridor to the City, Region and the Greater Golden Horseshoe (GGH).

Figure Exc.1: Simcoe Street Corridor



What is an Initial Business Case?

As per the Metrolinx Business Case lifecycle, the Initial Business Case (IBC) is the first Business Case of four that evaluates the case for investment.

The IBC is focused on:

- Comparing investment options and selecting a preferred option for further refinement and design.
- The IBC is typically used to secure funding from the province for planning and preliminary design.

The Problem

The corridor is forecasted to experience high rates of growth in the future. It is situated within the Region of Durham which is forecasted to grow in population and employment by 86% and 222%, from 2021 to 2051. At the municipal level, the City of Oshawa is forecasting increases of 64% and 68% for population and jobs respectively from 2021 to 2051. This change will place pressures on the corridor that will threaten to result in:

- Growth exceeding capacity in the transportation network; and
- Significant negative impacts to travellers, neighborhoods, and businesses along the corridor.

Mobility in the corridor today is heavily auto dependent, with 73% of trips made by auto. Public transit mobility is hindered in part by this high private vehicle use. Durham Region Transit (DRT) bus operations in the corridor have longer travel times than auto, are subject to multiple chokepoints with general traffic, are unreliable, and will exceed their capacity in future. There will be limited room to increase bus capacity in the future as well due to right-of-way constraints on Simcoe Street and the adverse impacts of operations in general traffic lanes. Subsidies required to cover the operational costs for a growing fleet of local buses will continue to increase in the future as well.

Heavy auto mode reliance results in congestion that negatively impacts corridor users, residents and the economy. It creates emissions, air pollutants and auto accidents and reduces access to opportunities resulting in reduced productivity and a corridor unable to realize its full potential.

The Opportunity

Addressing the problem results in three positive outcomes:

1. **Efficient and Connected Mobility:** Simcoe Street is currently one of the busiest bus corridors in the DRT network. Despite external forces that result in operational challenges, the corridor sees approximately 11,000 daily trips and transit demand has eclipsed pre-pandemic totals. Future east-west rapid transit corridors are in delivery or in plan to connect to the corridor to support the creation of a high-capacity and frequent rapid transit network that will provide efficient and connected mobility connections to the corridor. A north-south investment in the corridor can capitalize on these traits.
2. **Prosperity and Livability:** The corridor will be home to 35,000 jobs in 2051 and has educational institutions and employment areas primed for growth. Simcoe Street can facilitate economic growth and prosperity for the corridor, city and region. Reducing the negative externalities of the current mobility system in the corridor will lead to a safer and more sustainable corridor that is better to live in.
3. **Housing and Development:** Housing and development growth is planned for the corridor. Density targets exist that can be met by building more homes in a region undergoing acute housing demand pressures.

Two potential solutions are examined in this IBC that address the problem statement and act on the three identified positive outcomes. These solutions are aligned with key provincial, regional and local policies and plans and summarized below.

Options

The two options identified in this IBC to solve the problem and realize the identified positive outcomes are:

Option 1 – Bus Rapid Transit (BRT)

- A Bus Rapid Transit corridor operating largely in dedicated centre median transit lanes with electric-powered vehicles. Running one-way in downtown Oshawa through split segments with curbside bus lanes and providing a direct connection to Ritson Road GO Rail station.

Option 2 – Aerial Cable Car Transit (ACCT)

- An Aerial Cable Car Transit system consisting of an elevated ropeway supported by towers, with cabins attached to a continuously moving cable powered by an electrified stationary source. This option will consist of two branches, being a northern line running from Winchester Road south to Ritson Road GO Rail station, and a southern line operating from Fisher Street south to Lakeview Park. The elevated technology will require passengers to use stairs or elevators to access stations.

This IBC evaluates the performance of both options against a Business As Usual (BAU) scenario where no future improvements in north-south rapid transit along the corridor are made. The BAU assumes that existing DRT bus operations remain in place. The features and assumptions informing options are summarized in **Table Exc.1.1**.

Table Exc.1.1: Option features and assumptions

Attribute (AM peak)	Business as Usual	Option 1 – Bus Rapid Transit	Option 2 – Aerial Cable Car	
			North branch	South branch
<i>Structural design elements</i>				
Distance, km	10+3.5	14.1	10	3.5
Number of stops	34	18	13	4
Vehicle capacity – seated/total	34 / 50	50 / 74	20	20
Construction period	n/a	2029-2037 (8 years)	2029-2035 (5.5 years)	2029-2035 (5.5 years)
<i>Operating performance - Peak hour</i>				
Headway, min	5	1.6	0.4	0.4
Total capacity per hour per direction	648	2,925	3,000	3,000
Average speed, km/h	15 - 17	26 – 27	20	21

The performance of both options is evaluated across four cases:

- **Strategic:** benefits grouped under the three identified outcomes in the opportunity statement.
- **Economic:** examines how the options will deliver value to the region through an evaluation of the expected costs and user and societal benefits associated with the proposed options across the entire project lifecycle.
- **Financial:** assesses the financial impact to deliver each option through a review of project costs, including capital, operations and maintenance, and revenues generated across the project lifecycle to determine the net financial impact to the authority responsible for project delivery.
- **Deliverability and Operations:** assesses the requirements for delivering the investment by examining initial governance, delivery, operations and maintenance and commercial matters for the project and the associated risks.

Summary

The performance and resulting conclusions for both options analyzed in this IBC are summarized in **Table Exc.1.2** followed by case summaries.

Table Exc.1.2: Summary of option findings select metrics

	Option 1 – BRT	Option 2 – ACCT	Conclusions
Strategic Case (2051 metrics presented)			
Increased Annual Transit Ridership	4,590,000 new annual transit trips on the service	5,370,000 new annual transit trips on the service	ACCT attracts more transit riders
Improved Reliability and Reduced Travel Times	4.0-minute average transit trip time savings	4.0-minute average transit trip time savings	Options deliver the same travel time savings per average trip
Efficient Mobility	\$6.9 million increase in annual operating costs Annual incremental revenues of \$14.2 million	\$6.7 million annual operating cost savings Annual incremental revenues of \$18.8 million	ACCT is less expensive to operate, results in operating cost savings and has higher revenue generation potential
Job Creation	10,000 full-time job years created	13,000 full-time job years created	ACCT can create more jobs in the economy
Rapid transit access to population and employment	Population: 55,000-68,000 new residents within 800- and 5,000-metre catchment area of a rapid transit station Jobs: 17,000-28,000 new jobs within 800- and 5,000-metre of a rapid transit station	Population: 45,000-65,000 new residents within 800- and 5,000-metre catchment area of a rapid transit station Jobs: 14,000-27,000 new jobs within 800- and 5,000-metre of a rapid transit station	Options provide similar rapid transit connectivity to residents and jobs within 800 and 5,000 metres

	Option 1 – BRT	Option 2 – ACCT	Conclusions
A healthier and more sustainable Durham Region	Reductions in annual car trips resulting in: • 2 fewer auto collisions resulting in injury or fatality • -15,700 tonnes of GHG emissions • Fewer air pollutants, such as fine particulate matter (PM): -18 kg	Reductions in annual car trips resulting in: • 11 fewer auto collisions resulting in injury or fatality • -81,400 tonnes of GHG emissions • Fewer air pollutants, such as fine particulate matter (PM): -94 kg	ACCT results in fewer auto collisions and resulting injuries and removes higher amounts of GHG emissions and air pollutants
Access to housing development opportunities	470-480 total acres of land suitable for housing development within 500m from a rapid transit station	470-480 total acres of land suitable for housing development within 500m from a rapid transit station	Comparable performance
Economic Case (discounted real 2024\$)			
Total Costs	\$780M	\$780M	No difference between options on costs
Total Benefits	\$270M	\$660M	ACCT realizes higher total societal benefits
Benefit Cost Ratio	0.35	0.84	ACCT produces over double the benefit per dollar spent versus BRT
Net Present Value	-\$510M	-\$120M	ACCT has a NPV \$390 million greater in value than BRT

	Option 1 – BRT	Option 2 – ACCT	Conclusions
Financial Case (discounted nominal \$)			
Capital Costs	\$530M	\$770M	BRT has lower capital costs than AACT
Operating Costs	\$80M	-\$90M	ACCT generates net operating cost savings for transit
Total Revenues	\$170M	\$200M	ACCT has a higher revenue generation potential
Operating Cost Recovery Ratio	0.51	1.02	ACCT revenues exceed operating costs
Total Financial Impact (2024\$)	-\$470M	-\$540M	BRT has a reduced financial impact compared to ACCT
Deliverability & Operations Case			
Deliverability	BRT is more space-intensive, will take away general traffic lanes and affect more properties along the corridor. Well-tested technology used on other corridors in the Region.	Compact system that can mostly fit into the existing right of way. Limited application of this technology in North American urban settings. Dependence on a few available technology providers.	BRT is more difficult to deliver due to larger impacts to the local road network and properties, while ACCT poses risks as a less-tested technology
Operations and Maintenance	Higher average speeds but less reliable operations due to conflicts with local traffic at intersections.	ACCT has shorter headways. A fully separated right-of-way will provide strong reliability, however, the	ACCT is more reliable and can provide shorter headways but has slower operating speeds than BRT. However, it requires

	Option 1 – BRT	Option 2 – ACCT	Conclusions
	The system allows for detours when required.	technology will provide slower average operating speeds. System maintenance may result in temporary closures several times a year.	regular system maintenance periods.
Commercial	A variety of procurement models exist with varying degrees of ownership, operations and maintenance responsibility	A variety of procurement models exist with varying degrees of ownership, operations and maintenance responsibility	Identify a suitable model at a later stage in the Business Case lifecycle

Business Case Findings

The following key findings identified through business case analysis:

- **Strategic Case** - ACCT can provide higher levels of benefits across most benefit categories. It achieves higher ridership, reliability and an operating cost surplus, more jobs for the economy during project delivery, higher numbers of cars removed off local roads and access to housing development opportunities while BRT system design will necessitate interactions with general traffic, leading to a less reliable system and therefore less attractive choice for users, meaning lower benefits than ACCT.
- **Economic Case** - ACCT is forecast to generate nearly 2.5 times the benefits of BRT, with \$660 million in user and external societal benefits versus \$270 million for BRT and results in a Benefit Cost Ratio (BCR) of 0.84 versus 0.35 for BRT. This means that for every dollar spent on the project ACCT produces nearly half a dollar more in benefits than BRT.
- **Financial Case** - ACCT requires higher capital delivery costs of \$770 million versus \$530 million for BRT to deliver, but BRT will require an operating subsidy while ACCT will generate significant operating cost savings and net revenues that result in an annual operating surplus.
- **Deliverability and Operations Case** - BRT will carry significant impacts to urban realm, the transportation network, and properties across the whole corridor, while ACCT's impacts will be concentrated in station areas without significant impacts to the road network. ACCT can be delivered in a shorter time frame compared to BRT. A robust governance and procurement model is required for both options with no comparative differenced identified at this stage.

1 Introduction

Chapter Overview

Chapter 1 provides an introduction to the Initial Business Case (IBC), including key background information on the purpose and need of the business case and the structure of the document.

It includes:

- **Introduction**
- **Purpose**
- **Business Case Structure**

1.1 Introduction

This document is the Initial Business Case for the Simcoe Street Rapid Transit Project, which is a proposed new transit line running between Highway 407 and Lakeview Park in the City of Oshawa. The corridor is a central part of Oshawa and Durham Region's economy as it connects residents and businesses and several key destinations. Based on this, the Durham Transportation Master Plan 2017 (TMP) and Metrolinx's 2041 Regional Transportation Plan (RTP) have highlighted the need and opportunity for a Rapid transit corridor along Simcoe Street in Oshawa. Improved mobility on this corridor would connect residents and businesses to key destinations such as Ontario Tech University/Durham College, Lakeridge Health Oshawa, downtown Oshawa, Trent University Durham GTA Advanced Learning Centre, the Windfields growth area, the future Central Oshawa Ritson Road GO station and Lakeview Park.

Durham Region (the Region) completed a Visioning Study for the corridor in 2023 that outlined future plans for the Simcoe Street corridor in response to this opportunity. This vision focused on developing options that can:

- Provide safe, reliable and efficient rapid transit for people of all identities, abilities, and means;
- Support walking and cycling, enhancing the streetscape and accommodating goods movement and private vehicles; and
- Enable sustainable, inclusive, and affordable transportation solutions as a catalyst for development and economic growth in Oshawa and across the Region.

1.2 Initial Business Case Purpose

This Initial Business Case (IBC) is the next step of project development for Simcoe Street Rapid Transit. It was completed by reviewing the options identified in the Visioning Study and conducting subsequent early-stage design, costing, and forecasting. Business Cases are used in Ontario to both optimize projects and enable decision-makers to review them and provide direction. This IBC is modelled after Metrolinx's four-chapter evaluation structure which assesses ways in which a project can contribute to policy goals (strategic case), the wider socio-economic value unlocked by a project (economic case), the funding and financing needs to advance

the project (financial case), and the core requirements and risks related to project construction and operations (deliverability and operations case).

This IBC was developed to support three key decisions:

- Confirming the problem and/or opportunity and a potential set of solutions in the form of investment options that can respond to them.
- Determining if Simcoe Street Rapid Transit should advance to future stages of development.
- Defining a reference project (Defined by service, station locations, integration with transit and other modes, land development opportunities, and transit technologies) for use in subsequent stages of development.

Following direction to proceed, Simcoe Street Rapid Transit will advance to Environmental Approvals and further design.

1.3 Document Structure

This IBC is structured as follows:

- **Case for Change:** identifying the overarching problem and key issues which the future plans for Simcoe Street aim to address, the opportunity to address these issues and identified potential solutions;
- **Investment Options:** within this section we describe two alternatives for the Simcoe Street Corridor, the process by which these were developed and how they have been refined;
- **Strategic Case:** this case compares how the two options perform in respect to three strategic outcomes. These include impacts on efficient and connected mobility, prosperity and livability and housing development potential;
- **Economic Case:** this case appraises the costs and benefits of the scheme to provide an overall economic assessment;
- **Financial Case:** this case considers the capital, operational, maintenance costs and revenue impacts of the options;
- **Deliverability and Operations Case:** this case considers the overall deliverability of the scheme from the perspective of management and governance processes, technical requirements required, risks and procurement processes; and
- **Business Case Summary:** finally a summary of the IBC is presented, highlighting key insights for decision makers and next steps.

2 Case for Change

Chapter overview

The Case for Change sets out the overarching problem and rationale for investing in rapid transit along the Simcoe Street corridor. This chapter describes the issues currently facing the corridor and the opportunity that can be unlocked through investment in rapid transit. This chapter is structured as follows:

- **Problem Statement:** outlining the overarching problem and key issues that this Initial Business Case (IBC) seeks to resolve through investment in the transportation network;
- **Opportunity Statement:** presenting the opportunity available to address the problem statement and key issues; and
- **Solution Development:** where a range of potential options are identified and the evaluation framework to assess them is described.

2.1 Problem Statement

The Simcoe Street Corridor is a key north-south arterial in Oshawa, Durham Region and the Greater Golden Horseshoe (GGH). It is the only north-south transportation spine in the city that directly serves Downtown Oshawa, multiple key commercial and mixed-use areas and educational destinations. This leads to high demands on the transportation network which is currently not served by any form of rapid transit. The corridor is forecasted to undergo significant growth and development in the coming decades which will add further pressures on this busy corridor resulting in significant negative impacts to local travellers, neighborhoods, and businesses.

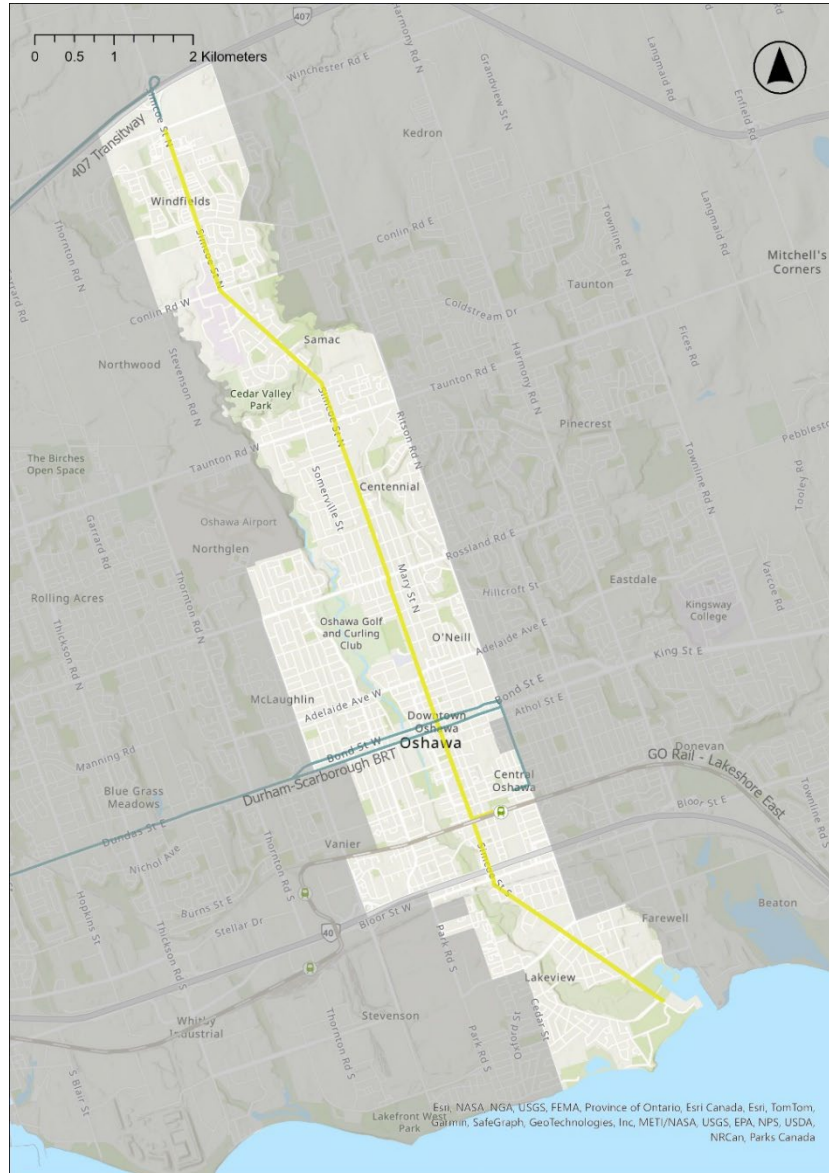
Without improved transportation, livability and economic development in the corridor will be constrained and prevent the corridor from realizing its full potential.

2.1.1 Problem Statement Context

The Simcoe Street corridor, as shown in **Figure 2.1**, connects Highway 407, Ontario Tech University/Durham College and the neighbourhood of Windfields in the north of Oshawa through the central and Downtown areas of the city, connecting to the future Central Oshawa Ritson Road GO station on the Bowmanville GO Extension, ending south of Highway 401 in the Lakeview neighbourhood of the city. Many key destinations in Oshawa are located on, or close, to the corridor, including major education and employment sites such as the Trent University Durham GTA Advanced Learning Centre, Lakeridge Health Oshawa, hotels, retail, commercial and recreational premises.

As of 2021, the population of Oshawa located within 1km of the Simcoe Street corridor was approximately 75,200. Within this same area there were just over 27,400 jobs, representing 51% of jobs in Oshawa and 13% of jobs in the region, emphasising the corridors existing economic importance in the GGH.¹

Figure 2.1: Simcoe Street Corridor



The Simcoe Street corridor is currently served by Durham Region Transit (DRT) bus and GO Bus services. The high frequency DRT Pulse 901 service runs the street's length from Lakeview Park in the south to Windfields Farms Drive via Ontario Tech North Campus in the north at approximately 10-minute weekday frequencies. Despite this service frequency, existing modal share on Simcoe Street is calculated to be up to 73% auto-based and only 6% transit-based trips. All services utilising Simcoe Street are summarized in **Table 2.1**.

¹ Simcoe Street Rapid Transit Visioning Study

Table 2.1: Overview of Simcoe Street transit services²

Route #	Limits	Weekday			Weekend	
		AM/PM Peak	Midday	Evening (after 19:00)	Daytime (until 19:00)	Evening (After 19:00)
901 Pulse	Lake View Park or Oshawa Centre and Windfields Farm Drive via Ontario Tech/Durham College	10 min	10 min	15 – 30 min	15 min	15 – 30 min
905	Winfields Farm Drive and Taunton Road	15 min	15 min	30 min	30 min	30 min
920	Conlin Road and Taunton Road	15 min	15 min	30 min	-	-
302B	Britannia Avenue and Ontario Tech/Durham College	15 min	30 min	30 min	30 min	30 min
52	Highway 407 and 401 via Ontario Tech /Durham College	30 min	30 min	60 min	60 min	60 min
92	Bond Street East and Bloor Street East	60 min	60 min	60 min	60 min	60 min
N2	Wentworth and Windfields Farm Drive (Overnight – 7 days a week)	30 min	30 min	30 min	30 min	30 min

2.1.2 Root Cause of the Problem: Growth will exceed capacity on the transportation network

The GGH is forecasted to grow to 11.2 million people and 5.4 million jobs by 2051. The Region of Durham is one of the fastest growing regions in the GTHA, as it is forecasted to have a population of 1.3 million and employment of 460,000³, representing increases of 86% and 222%, from 2021 to 2051. Within this is the City of Oshawa, which is one of Canada's fastest growing cities, seeing population growth of 10% between 2016 and 2021. By 2051, Oshawa's population is expected to reach almost 300,000, with employment over 107,000 jobs, increases of 64% and 68% respectively compared to a 2021 baseline. Much of the City's future growth is expected within Downtown Oshawa and along or close to the Simcoe Street corridor.

² Adapted from Simcoe Street Rapid Transit Visioning Study

³ A Place to Grow: Growth Plan for the Greater Horseshoe, 2019

Population and employment growth will create additional pressure on the transportation network, particularly if existing high auto mode shares and low transit mode shares remain unchanged.

Transit ridership along the corridor is increasing, but capacity is struggling to keep up with demand. In 2024, DRT is expected to experience a projected ridership growth to 13.4 million passengers, exceeding peak-pre-pandemic ridership by 30%.⁴ Simcoe Street is currently one of the busiest bus corridors in the entire DRT network and the Pulse 901 service is one of the busiest routes in the Region. Demand will likely continue to increase, especially as rapid transit corridors in Durham Region and Oshawa come online. Projects that are either 'in delivery' or 'in plan' include:

- GO Rail Bowmanville Extension (with half hourly peak period service)⁵
- Durham-Scarborough BRT (a bus every 4 minutes or less)⁶
- Further potential transit investments along the corridors of Taunton Road East as well as Highway 407

Current DRT operations on the corridor are near capacity – without investment, they will be unable to absorb additional travel demand. Buses already run above total capacity for 82% of the length of the corridor (southbound) during the AM peak, leading to crowding issues. Route 901 operates 40-foot conventional buses with a total capacity of 54 passengers and a limited number of articulated buses with a total capacity of 78 passengers. DRT cannot run more articulated buses on this corridor since it has a limited number of articulated buses in its fleet. This lack of additional transit capacity is preventing efforts to increase transit mode share on Simcoe Street.

2.1.3 Impact of not addressing the problem: slow travel, congestion, and reduced prosperity and quality of life and environment

Without action, increasing population growth will mean that the transportation network can no longer meet travel demand. This will lead to greater congestion on Simcoe Street and across Oshawa, leading to slower travel, reduced prosperity, and limited development potential.

Impact on travelers

Travel times along Simcoe Street are already unreliable, for both auto and transit users. This is particularly the case during the PM peak, when congestion increases travel times at pinch points around Adelaide Avenue, King Street, Bond Street, and Gibb Street, as well as between Olive Avenue and Bagot Street.⁷ Population growth will worsen traffic, making journeys take longer and making it harder for people to plan trips. Slow and unreliable trips due to congestion are estimated to create \$50

⁷ Simcoe Street Transit Priority Pilot Study (2020)

million annually in disbenefits for Oshawa and modelling suggests this will increase to \$245 million by 2031 if nothing is done.⁸

Impact on residents and businesses

Worsening traffic would cost Oshawa's residents and businesses by limiting access to economic, cultural, and social opportunities along Simcoe Street and surrounding areas. Slower travel times may lead some people to avoid traveling to or through downtown Oshawa, depriving businesses of customers. Some people may also limit how far they are willing to commute due to traffic or poor transit options, limiting the number of jobs that they can apply to, and reducing the labour pool that employers have access to. The Region estimates that between 2016 to 2051 employment along the corridor could increase by up to 46% – equalling 35,000 jobs – but this forecast could be imperiled by worsening congestion. Each of these consequences would hinder Oshawa and the broader Durham Region's productivity and economic growth, impacting prosperity.

Increased congestion will increase greenhouse gas (GGH) emissions and pollution. In Durham Region, transportation represented the largest source of energy consumption and GGH emissions in 2015, accounting for just under a half (47%) of all greenhouse gas emissions produced. Longer travel times from traffic will lead to greater idling or lead to travelers taking long detours that increase vehicle kilometres traveled, impeding the Region's sustainability goals.

Impact on housing and development

Significant population growth is expected along the Simcoe Street corridor – planned development in Downtown Oshawa includes 13,500 proposed residential units for 27,000 new residents and 140,000 square metres of new commercial space and 4,600 new jobs. In the Region's Envision Durham Municipal Comprehensive Review, Simcoe Street is designated as a rapid transit corridor and has a minimum density target of 150 jobs and people per gross hectare. If the area becomes too congested, its attractiveness for development will diminish, preventing planned development from occurring. This will prevent Oshawa and the Durham region from achieving their housing targets, exacerbating the existing housing challenges.

⁸ Integrated Transportation Masterplan, 2015 https://www.oshawa.ca/en/transportation-parking/resources/Documents/ES_-ITMP-March-3-2015.pdf

2.2 The Opportunity: Leverage Transit to Support Growth and Unlock Corridor Potential

Limited road space on Simcoe Street means that improvements to the transit network are the most effective way to tackle this problem. **Table 2.2** highlights how transit can act as a solution.

Table 2.2: How transit can help improve the situation

Theme	How is transit a potential solution?	Benefit of Acting
Providing Transportation Capacity to Support Growth	Transit ridership on the corridor is among the highest in Durham Region	• Providing enough transportation capacity to reliably serve 11,000 people per day, as well as new demand that stems from greater population and jobs growth. • Reducing congestion by offering travelers an efficient alternative to driving. • Serving higher demand more cheaply, since rapid transit has lower operating costs at sufficiently high ridership levels.
Unlocking Corridor Potential	Significant job growth is expected on the Simcoe Street corridor, but this will only be realized if people are able to travel to, from, and along Simcoe Street quickly, flexibly, and reliably.	• Providing access to more opportunities and creating new jobs for residents of the corridor, city, Region and beyond. • Supporting the expansion of post-secondary institutions along the corridor like Ontario Tech and Trent University by providing access to these institutions for students and staff • Creating jobs in skilled trades, project delivery, and operations during project delivery, resulting in greater spending and activity in the corridor during and after project delivery. • Taking cars off the road, reducing pollution, accidents, and negative environmental externalities.
Housing and Development	Future housing development can be supported by offering access to transit and mitigating congestion	• Enabling Simcoe Street's attractiveness for housing development by keeping congestion in check. • Offering future residents' multiple ways to get around efficiently and flexibly.

2.2.1 Benefits of Addressing the Problem

Addressing the problem statement offers three positive outcomes for the corridor, the city, and the region:

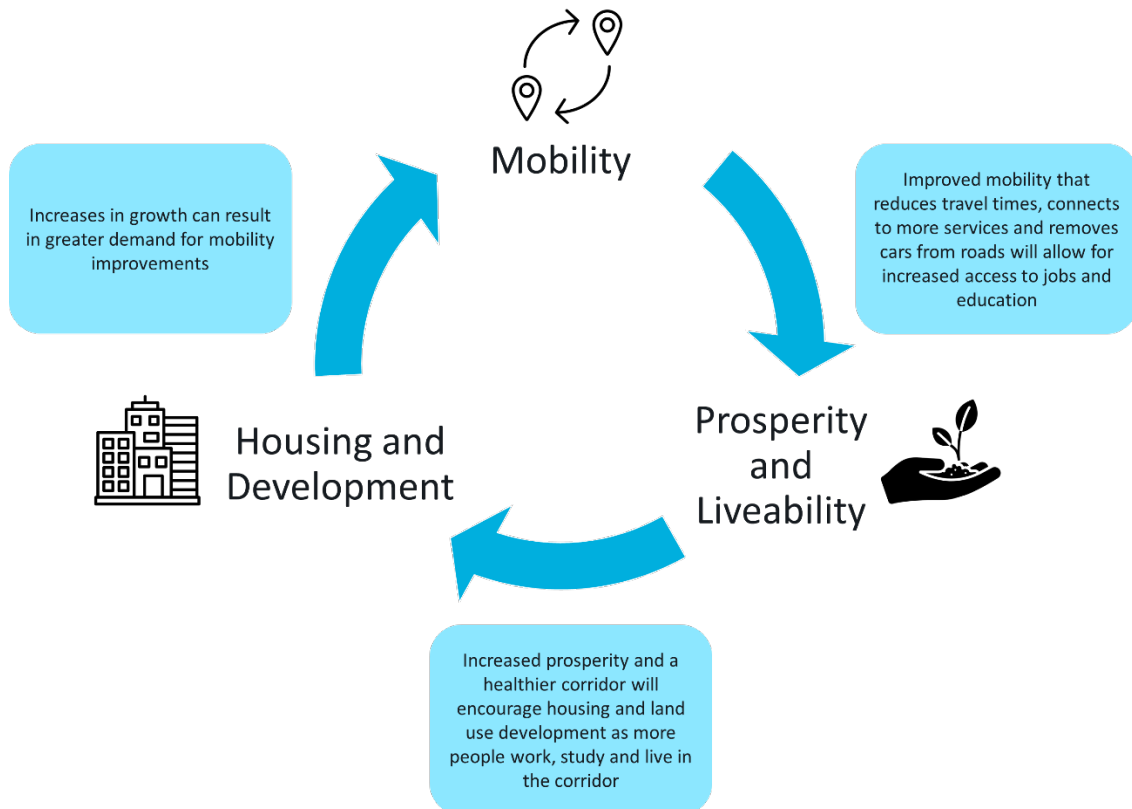
1. Efficient and Connected Mobility
2. Prosperity and Livability
3. Housing and Development

A vision for the corridor

The Region of Durham completed a Visioning Study for the corridor in 2023, which articulates a vision for Oshawa and a Simcoe Street corridor that provides safe, reliable and efficient rapid transit for people of all identities, abilities, and means. It will support active travel to enhance the streetscape while accommodating goods movement and private vehicles, and will provide sustainable, inclusive, and affordable transportation solutions as a catalyst for development and economic growth in both Oshawa and across the Region.

An investment that can realize these outcomes and benefits is a rapid and connected transit service. This type of investment can provide efficient and connected mobility, improve the prosperity of and livability in the corridor and incentivize ongoing and planned housing and development. These outcomes can facilitate one another in a cycle of benefit generation driven by the investment in rapid public transportation. This cycle is illustrated in **Figure 2.2**.

Figure 2.2: Outcome realization cycle



2.3 Problem and Opportunity Alignment with Key Policies and Plans

Addressing the problem statement and acting on the opportunities in the corridor is aligned with key provincial, regional and local policies and plans as summarized in **Table 2.3**.

Table 2.3: Project contribution to Provincial, Regional and Municipal plans

Policy Document	How does the problem statement align with the Policy or Plan?
Government of Ontario – Provincial Policy Statement (PPS)	• Supports creating strong and complete communities, sustained economic prosperity, a clean and healthy environment and major transit station areas on higher order transit corridors. • Contains the PPS framework, guiding the Project as it relates to efficient land use patterns, integrated infrastructure and transportation systems, long-term economic prosperity, and natural heritage.
Government of Ontario – A Place to Grow: Growth Plan for the Greater Golden Horseshoe (Growth Plan)	• The long-term growth management framework for the region to ensure a strategic, comprehensive, and integrated approach to guide population and employment growth to 2041. • Primary objective of supporting future growth is to provide access to a range of transportation options to support the realization of complete communities. • Supports climate change mitigation by increasing mode share for transit (and active transportation) by minimizing land consumption through compact built form. • Includes principles to prioritize intensification and higher densities in strategic growth areas to make efficient use of land and infrastructure and support transit viability. • Provides a policy context which supports rapid transit, prioritizing growth at higher densities along rapid transit spines to improve ridership potential.
Metrolinx – 2041 Regional Transportation Plan (RTP)	• Defines a blueprint for creating an integrated, multimodal regional transportation system following the goals of strong connections, complete travel experiences and sustainable and healthy communities • Calls to create a ‘people-centered’ transportation system which improves lives by providing attractive choices • Identifies Simcoe Street as a rapid transit project in plan, complementing the existing network and future expansion program. • To supplement the RTP, a Frequent Rapid Transit Network Prioritization Framework guides the sequence of business case development and investment in transit projects with a Simcoe Bus Rapid Transit concept assessed and placed in the “Refine & Monitor” group

Policy Document	How does the problem statement align with the Policy or Plan?
Durham Region – Official Plan (ROP) Envision Durham	• Encourages the province to invest in rapid transit infrastructure to support regional and economic growth and employment opportunities • Supports implementation of a rapid transit spine on Simcoe Street, a designated Rapid Transit Corridor. • Outlines Strategic Growth Areas in Durham (optimal locations for prioritizing intensification and higher density mixed-use development) include Rapid Transit Corridors. • Identifies Simcoe Street as a Rapid Transit Corridor and Strategic Growth Area providing a supporting regional policy context for the introduction of rapid transit on Simcoe Street.
Durham Region – Transportation Master Plan (TMP)	• Provides strategic planning policy direction to guide the development of programs and infrastructure required to manage expected long-term transportation demands in the Region • Aims to ensure that the transportation network supports compact, mixed-use land patterns and strengthen the role of public transit in meeting travel demand while improving goods movement and making strategic investments in the transportation system.
City of Oshawa – Strategic Plan (OSP)	• The City's highest policy document that identifies a long-term vision • Identifies four priority areas and associated outcomes, with priorities of: Vibrant Culture and Economy, Safe and Sustainable Environment, Inclusive and Healthy Community and Governance and Service Excellence • Outcomes with associated goals and actions, relevant when considering the strategic fit for rapid transit in Oshawa particularly the goal to support sustainable and safe modes of transportation
City of Oshawa – Official Plan	• Proposes an overall development pattern for the City, and provides guidelines for the preparation of Part II Plans, plans of subdivision, zoning bylaws, site plans and other measures which implement the Official Plan. • The Downtown Oshawa Central Area is envisioned to serve as a major employment centre and is a primary focus area for major office uses and will accommodate a built form that is compact and affords residents the ability to access commercial, retail, institutional, recreational, cultural uses, and entertainment. • Higher density residential uses, public services and the Central Oshawa Transportation Hub intended for the Downtown Oshawa Central Area.

Policy Document	How does the problem statement align with the Policy or Plan?
City of Oshawa – Integrated Transportation Master Plan (ITMP)	• Aims to achieve a balanced, sustainable, multi-modal transportation system over a 20-year horizon • Goals for a future system that: improves mobility, alleviates congestion and encourages sustainability. • Encourage DRT and the Region on plans such as bus queue jump lanes, traffic signal priority, roadway Improvements (widen Simcoe Street), and transit-oriented development at the proposed Ritson GO. • Supports conducting study to analyze the impacts of converting one-way streets to two-way in downtown.

2.4 Evaluation Framework

This IBC uses a standard four-case approach to evaluate the performance of rapid transit options. This framework follows regional practice as per Metrolinx's Business Case Guidance. The cases, their focus and key metrics are shown in **Table 2.4**.

Table 2.4: IBC Evaluation Framework

Case	What is Evaluated?	Key Metrics
Strategic (Chapter 4)	The extent to which options can achieve the three outcomes of mobility, prosperity and liveability and housing and development and realize benefit categories within each	Seven strategic benefits are evaluated, grouped by the three outcome areas of the opportunity that the project is trying to realize. Within each benefit are a single or multiple strategic metrics, being: Efficient and connected mobility: • Change in annual boardings including tourism uplift • Change in average transit travel time per trip • Change in annual operating costs • Change in annual revenue Prosperity and liveability: • Number of full-time job years created by the project during construction and delivery • Change in residents within an 800 m and 5 km catchment of a rapid transit station • Change in jobs within an 800 m and 5 km catchment of a rapid transit station • Change in annual auto collisions resulting in injury or fatality • Change in annual tonnes of GHG emissions • Change in annual air pollution Housing and development: • Area suitable for housing development within 500m from a rapid transit station
Economic (Chapter 5)	Assesses the costs and benefits to society of each option to provide an overall economic assessment	A 60-year assessment of: • Total benefits including user and external benefits • Total costs including capital, operating and maintenance and renewals • Benefit Cost Ratio (BCR): benefits/costs • Net Present Value (NPV): benefits – costs

Case	What is Evaluated?	Key Metrics
Financial (Chapter 6)	Assesses the financial cost to the Region of Durham to deliver the options	A 60-year assessment of the following: • Capital costs • Operating and maintenance costs • Revenue impacts
Deliverability and Operations (Chapter 7)	Considers the impacts and risks of delivering, operating and maintain the options and commercial considerations for each	• Delivery timelines • Operations and Maintenance Facility Requirements

3 Investment Options

Chapter overview

This Chapter describes a set of two rapid transit alternatives for the Simcoe Street Corridor, which will be analyzed in the four evaluation chapters of this Initial Business Case.

This section includes:

- **Options Development Process:** details how the two options assessed in this Initial Business Case were identified from an initial long list, and
- **Options for Analysis:** Description of the Business as Usual (BAU) case that the options will be assessed against and the two options assessed, including a summary of their key attributes and assumptions.

3.1 Options Development Process

The desire for enhanced rapid transit on the Simcoe Street corridor was most recently identified as per the Region’s 2023 Visioning Study. The preliminary focus of this study was identifying a transit technology. A principles first approach was applied to identify and scope potential transit technologies. The process involved:

- Review of previous studies, plans, and proposals for the corridor;
- Identifying rapid transit technologies that can meet the needs and vision of the corridor;
- Obtaining agency, public and interested party feedback; and
- Creating a long list of technology options by transit type for further consideration, summarized in **Table 3.1**.

Table 3.1: Potential options long list

Transit Type	Technology
At-Grade	• Bus Rapid Transit • Light Rail Transit
Aerial	• Monorail/Light Metro • Gondola
Underground	• Subway/Light Rail

The initial long list of five options was reduced to two, based on a review of anticipated high-level costs, corridor fit, initial travel demand modelling and type of alignment. This screening process removed subway, light metro and light rail transit from further consideration at this time. This was due to their anticipated levels of demand expected in the corridor, the extensive costs of certain technologies (tunneling for a subway technology for instance) and the more appropriate nature of an at grade or elevated technology investment.

As a result, two technology options remained and were determined for further analysis in a complete Initial Business Case, being:

1. **Option 1 – Bus Rapid Transit (BRT)**
2. **Option 2 – Aerial Cable Car Transit (ACCT)**

For the purposes of analysis in this IBC, Option 1 is referred to as ‘BRT’ and Option 2 as ‘ACCT’.

3.2 Options for Analysis

3.2.1 Business as Usual

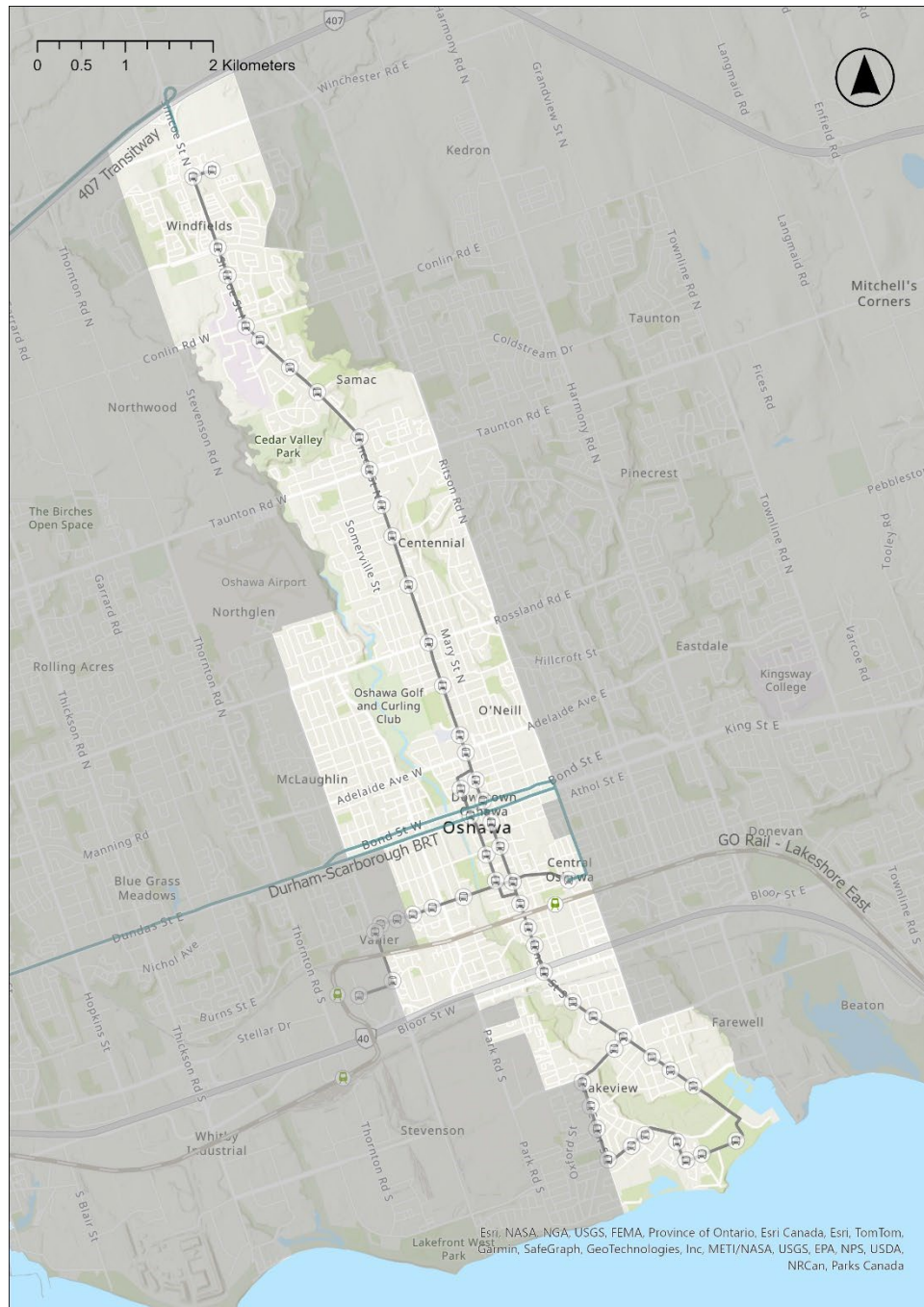
To understand the scale of change that either option can bring to Durham Region they must be compared against a Business as Usual (BAU) scenario. The BAU represents the transit network in the Region of Durham in 2051 and without any new rapid transit capital investments along the Simcoe Street corridor. Even without any major capital project investments, anticipated growth in demand for transit on the corridor is expected to bring with it frequencies double that of current service, being 5 minutes during the peak hours and 7.5 minutes during off-peak hours. These increased frequencies are assumed in the BAU. It is also assumed that the Simcoe Street corridor will be primarily served by two bus routes shown in **Figure 3.1** and summarized below:

- Pulse 901 – running 9.3 km from Windfield Farms Dr in the north down Simcoe Street to Oshawa GO Rail station in the south. Oshawa GO station is accessible from a bus terminus north of the rail corridor (bus routed through Olive Avenue)
- 401 local bus – serving the southern section of Simcoe Street between Gibb Street and Lakeview Park. Running 5 km from the new GO Rail Thornton’s Corners East station. There is no through route running for the entire length of the Simcoe Street corridor, a trip from north to any areas south of Olive Avenue will require a transfer.
- Additional buses will continue operating on some segments of Simcoe Street as indicated earlier in **Table 2.1**

While no investments are made on Simcoe Street running north-south, by 2051 it is assumed that the transit network in Durham will include substantial improvements to East-West rapid transit corridors crossing Simcoe Street. being:

- The GO Rail Bowmanville extension will offer a new rail station in southern downtown Oshawa, Ritson Road GO, 300m to the east from Simcoe St;
- The Durham-Scarborough BRT will have a connection to Simcoe Street corridor at Bond/King Streets and terminate at Ritson Road GO; and
- The 407 Transitway will have its eastern terminus at the north end of Simcoe Street corridor on Winchester Road.

Figure 3.1 Business as Usual route



3.2.2 Option 1 – Bus Rapid Transit

A Bus Rapid Transit corridor would shift DRT bus operations to dedicated transit lanes along the Simcoe Street corridor. Key features of the BRT alignment include operating electric-powered in a median bus lane from the future 407 Transitway Station with Park-and-Ride facility in the north to Adelaide Avenue. An example of a median bus lane alignment is provided in **Figure 3.2**.

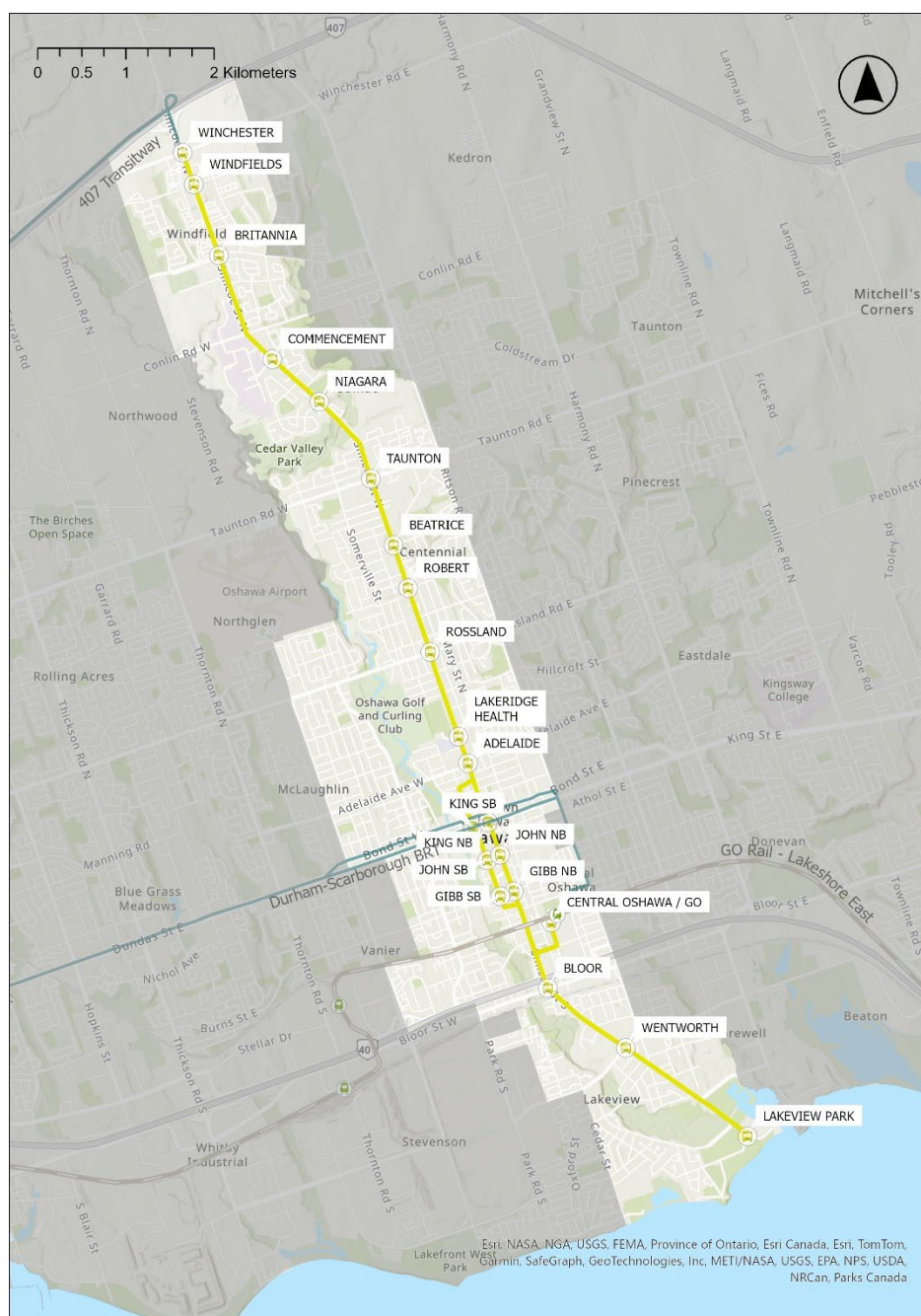
Figure 3.2 Taunton Street Station BRT with median bus lanes concept (preliminary visualization provided by the Region of Durham)



The BRT corridor will split within downtown Oshawa running one-way southbound on Centre Street and northbound on Simcoe Street between Adelaide Avenue and Olive Avenue with curbside bus lanes. South of Olive Avenue buses would continue to run along Simcoe Street on curbside bus lanes all the way to Lakeview Park.

Access to Ritson Road GO Rail station will be provided via First Avenue and Front Street south of the CP rail corridor, diverting the buses off Simcoe Street for 1km (both ways). The BRT would offer through trips from north to south Oshawa eliminating the transfer that was required previously to get south of Olive Avenue.

Figure 3.3 Bus Rapid Transit route



Buses will run at 1.6-minute headways during the peaks and 4 minutes during off-peak. This means that passengers will wait 0.8 minutes on average for a bus at any of the 18 stations spaced 780m apart on average. Buses will have an average operating speed of 26-27 km/h with smaller variation depending on time of day or direction than in Business-as-Usual scenario.⁹

⁹ The modeling of speeds did not include microsimulation hence, the average speed might be updated during later stages of this study.

The fleet is planned be upgraded to articulated buses with a total capacity of 78 passengers (50 seated), increasing capacity by 350% compared to BAU. The capacity provided will place the Simcoe Street corridor among a short list of corridors with similar transit capacity in the entire GGH as shown later Section 3.2.3 **Figure 3.5**.

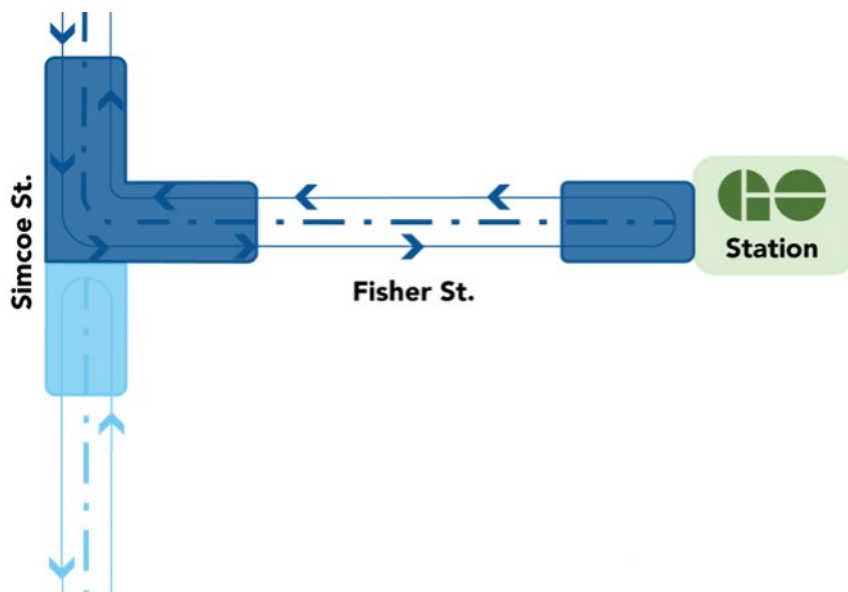
Providing BRT dedicated lanes and stations will require reallocating existing general traffic lanes to buses and the widened in some places of the Simcoe Street corridor.

3.2.3 Option 2 – Aerial Cable Car Transit

This option considers an Aerial Cable Car Transit (ACCT) system along the Simcoe Street corridor. It consists of an elevated ropeway supported by towers, with cabins attached to a continuously moving cable powered by a stationary source (electrified power). At stations, the cabins detach from the main cable and move at low speeds, allowing passengers to safely board and disembark. Of the multiple ACCT technologies available, the Cable Car Feasibility Study (2024) selected TRI-Line, or similar, as a preferred one.

The corridor will consist of two branches. A northern line running from Winchester Road south to Ritson Road GO Rail station along Simcoe Street. and a southern line operating from Simcoe and Fisher south to Lakeview Park. This means that a trip from northern to the southern Oshawa will require a transfer between branches at Fisher Street as shown in **Figure 3.4**.

Figure 3.4 Configuration of transfer between northern and southern ACCT lines (Cable Car Feasibility Study).

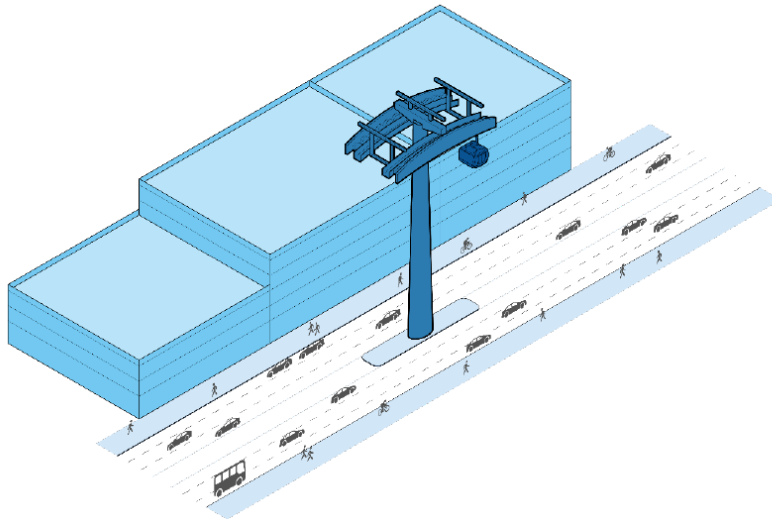


Cable Car stations will be elevated at 9m above street level, which will require passengers to use stairs or elevators to access the system. Once at platform level passengers can expect headway of 24 seconds during the peak and 1 minute off-peak with the average speed of the ACCT system reaching 20-21 km/h (based on the Feasibility Study). This means that passengers wait times will be minimal with cabins arriving every 24 seconds during the peak and 60 seconds off-peak. The option is planned to have 17 stations, with an average spacing of 850m.

Cable cars in the preferred configuration will be able to operate with large 20-passenger cabins with the potential to increase capacity further by adding more cabins. As with BRT, this option will increase transit capacity along the corridor by 350% compared to the Business-as-Usual scenario.

ACCT requires towers along the corridor that are spaced at approximately 250m with the bases of the towers placed in medians (as seen in **Figure 3.5**) or what are currently auto turn lanes.

Figure 3.5: Monopole tower placed in the road median (Cable Car Feasibility Study).



Stations will be approximately 17 m wide and would fit in the right-of-way of Simcoe Street in most locations along the corridor with minimal impact on traffic lanes and surrounding properties as seen in an example of station allocation at Conlin & Simcoe Street in **Figure 3.6**.

Figure 3.6 Conlin Station of Cable Car (preliminary visualization provided by the Region of Durham)

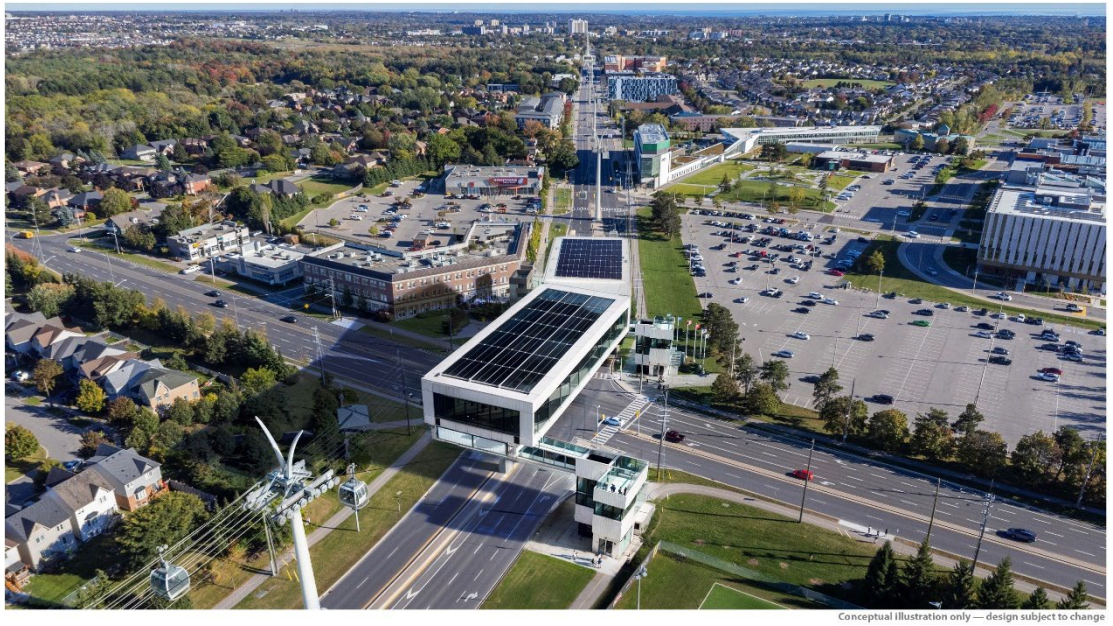
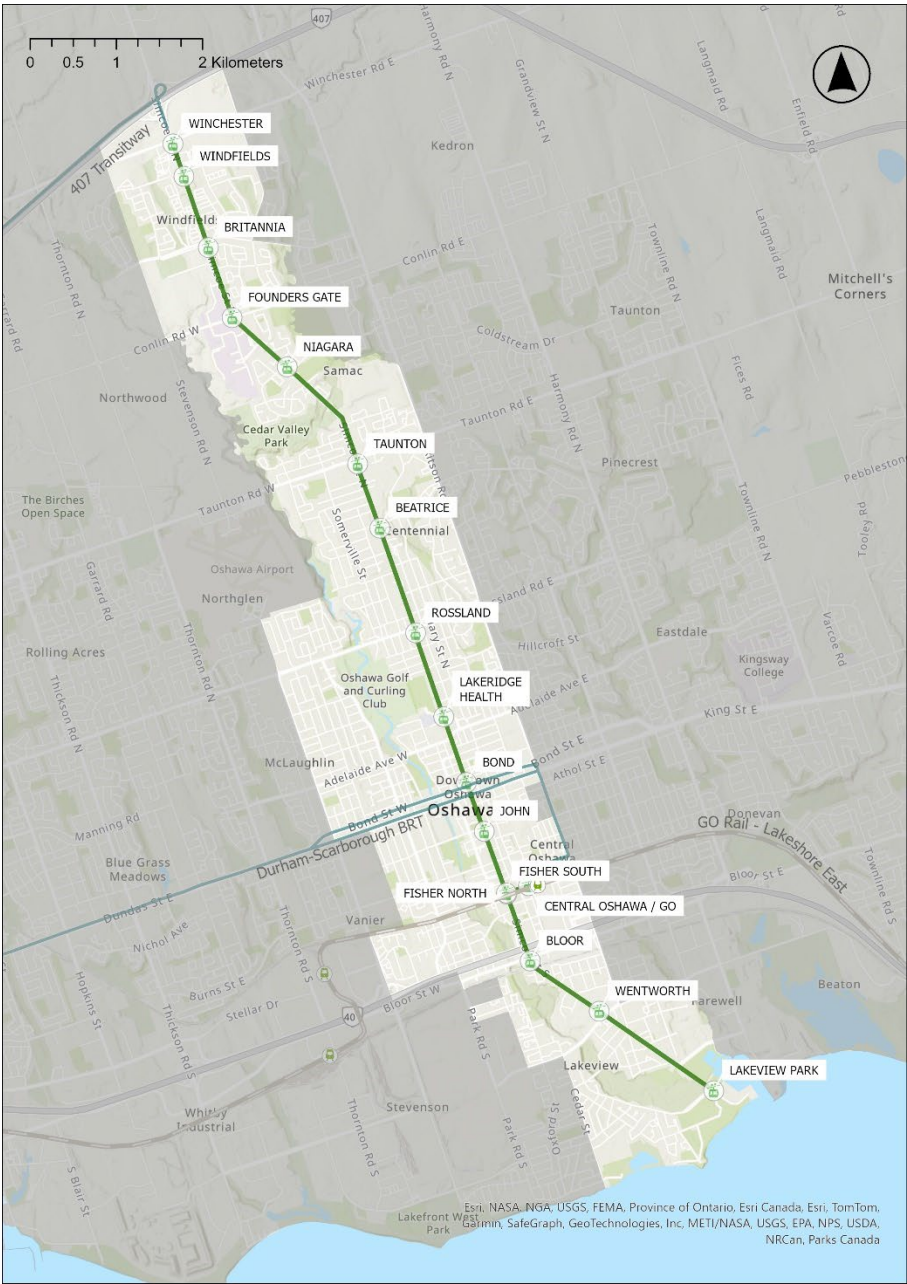


Figure 3.7 Aerial Cable Car route



3.2.4 Option Summary

Table 3.2 below provides a summary and comparison of key attributes and assumptions as detailed in this chapter and later in this document for both the BAU and the options under analysis. Core elements around design, capital cost intensity and operating metrics have been used as relevant proxies to assess the overall performance between each option. Key elements include:

- **Structural design elements** – this includes the entire route distance, number of stations/stops, spacing between stations, vehicle capacity, fuel type and end-to-end construction period. Assessing each option on these elements helps set the basis for the structural impact each option has, which then has a knock-on effect to the relative operational and capital performance of each option.
- **Capital costs** – this includes capital expenditures associated with each option. Note that costs are in real 2024\$ without escalation.
- **Operating costs** – these include relevant operating costs on a per kilometre basis, as well as per bus hour and per bus year. In addition, costs associated with various operating tactics such as spare ratios, turn round times and dead heading are observed in real 2024\$. These proxies inform the relative operational spending intensity between each option, which should also be compared against the operational performance of each option.
- **Operational performance assumptions** – relevant assessment has been done on peak and off-peak times, where assumptions around headway, capacity per hour and speed averages are assessed. In total, these proxies establish the relative operational performance of each option.

All items included in this table inform option performance in subsequent chapters.

Table 3.2: Option summary

Attribute (AM peak)	Business as Usual	Option 1 – Bus Rapid Transit	Option 2 – Aerial Cable Car	Option 2 – Aerial Cable Car
			North branch	South branch
<i>Structural design elements</i>				
Distance, km	10+3.5	14.1	10	3.5
Number of stops	34	18	13	4
Spacing, m	400	780	830	1.27
Vehicle capacity – seated/total	34 / 50	50 / 74	20	20
Fuel type	Electric*	Electric	Electric	Electric
Construction period	n/a	2029-2037 (8 years)	2029-2035 (5.5 years)	2029-2035 (5.5 years)
<i>Capital costs</i>				
Nominal terms (\$ millions)	\$80	\$800	\$1,090	
<i>Operating costs</i>				
Per km (2024\$)	\$1.24 (40ft)	\$1.24 (40ft) / \$1.68 (Articulated)	\$1.24 (40ft)	\$1.24 (40ft)
Per bus hour (2024\$)	\$96.88			
Per bus per year (2024\$)	\$68,966			
Spare ratio	10%			
Turn Round Time	10% or fixed minimum of 5 min			
Dead Head Allowance	10% of kms and hrs			
<i>Operating performance - Peak hour</i>				
Headway, min	5	1.6	0.4	0.4

Total capacity per hour per direction	648	2,925	3,000	3,000
Average speed, km/h	15 - 17	26 – 27	20	21
<i>Operating performance - Off-peak</i>				
Headway, min	7.5	3	1	1
Total capacity per hour per direction	432	1,170	1,200	1,200
Average speed, km/h	15 - 17	26 - 27	20	21

* As part of DRT's commitment to achieving zero greenhouse gas emissions through a sustainable network of vehicles, infrastructure, and facilities by 2037, all buses in the DRT fleet are being examined for replacement with zero emission buses.

4 Strategic Case

Chapter overview

The Strategic Case outlines the performance of all options in support of the desired outcome areas for the Simcoe Street corridor.

The Strategic Case is one of two cases (the other being the Economic Case) focused on the rationale for pursuing an investment.

This chapter includes:

- **Strategic Case Analysis Approach:** a description of the methodological approach applied, and overview of the strategic benefits and metrics assessed in this chapter.
- **Strategic Evaluation:** an option-by-option analysis of performance in future forecast year 2051 against the three desired outcome areas.
- **Strategic Case Summary:** a summary of option performance, key findings and chapter take aways.

4.1 Strategic Case Analysis Approach

This chapter summarizes a strategic evaluation of each option spanning seven key benefits. Each benefit includes one or more metrics to clearly illustrate option performance and discern key differences in performance between BRT and ACCT. Benefits were estimated using outputs from the Region of Durham GTAv4 travel demand model, census data, land use data, and GIS analysis. The outcomes, benefits, and metrics used in this chapter are shown in **Table 4.1**.

Table 4.1: Strategic case structure and total benefits

Outcome	Benefit	Metric
1. Efficient and Connected Mobility	Benefit 1 – Increased Annual Transit Ridership	Change in annual boardings (including tourism uplift)
	Benefit 2 – Improved Reliability and Reduced Travel Times	Change in average transit travel time per trip (minutes)
	Benefit 3 – Efficient Mobility	Change in annual operating costs (\$ millions)
		Change in annual revenue (\$ millions)
2. Prosperity and Liveability	Benefit 4 – Job Creation	Number of full-time job years created by the project (FTE)
	Benefit 5 – Rapid transit access to population and employment	Change in residents within an 800 m and 5 km catchment of a rapid transit station
		Change in jobs within an 800 m and 5 km catchment of a rapid transit station
	Benefit 6 – A healthier and more sustainable Durham Region	Change in annual auto collisions resulting in injury or fatality
		Change in annual GHG emissions (tonnes)
		Change in annual air pollution (CO, NO _x , VOCs, PM, SO ₂ , NH ₃)
3. Housing and Development	Benefit 7 – Access to housing development opportunities	Area suitable for housing development within 500m from a rapid transit station (acres)

4.2 Strategic Evaluation

4.2.1 Outcome 1 – Efficient and Connected Mobility

This outcome explores how the options can impact efficient and connected mobility in the regional transportation network. Efficiency is measured with respect to costs to operate and provide mobility services, and connected mobility illustrates the relative ease of moving between places. Together, efficient and connected mobility is realized by providing fast and reliable public transit at a lower cost to operate for the service provider and by delivering better connections to regional transportation network users that enables ease of movement between places. Three benefits have been identified for this outcome area:

- Benefit 1 – Increased annual transit ridership
- Benefit 2 – Improved reliability and reduced travel times
- Benefit 3 – Efficient mobility

Benefit 1 – Increased Annual Transit Ridership

By 2051, there will be over 5.37 million ACCT trips per year (+17,300 per day) on the Simcoe Street corridor, compared to 4.59 million on BRT (+14,800 per day).

What is the benefit?

This benefit assesses the potential of each option to generate ridership on their service. Speed, accessibility, reliability and attractiveness are all factors that influence how options attract users to their service and the broader regional transit network.

How do the options perform?

Both ACCT and BRT will serve existing passengers and generate net new transit trips, highlighting how they improve the transit network at a municipal level and regional level. Ridership in 2051 is shown in **Figure 4.1**, which notes that:

- **ACCT** will serve 31,300 trips per day (of which 17,000 are new), this means 9.69 million trips per year (of which 5.37 million are new).
- **BRT** will serve 28,700 trips per day (of which 15,000 are new), this means 8.91 million trips per year (of which 4.59 million are new).
- Deploying rapid transit will more than double transit ridership on the corridor compared to using local bus service.

Both options can significantly increase transit usage in Oshawa. For example, 2051 boardings on ACCT will exceed the current boardings of the top four performing DRT routes combined (the 901, 900, 920 and 905) and account for approximately a half of DRT's weekday boardings in 2023. This demonstrates a positive contribution and attainment of the outcome area 1 goal to provide efficient and connected mobility in the corridor.

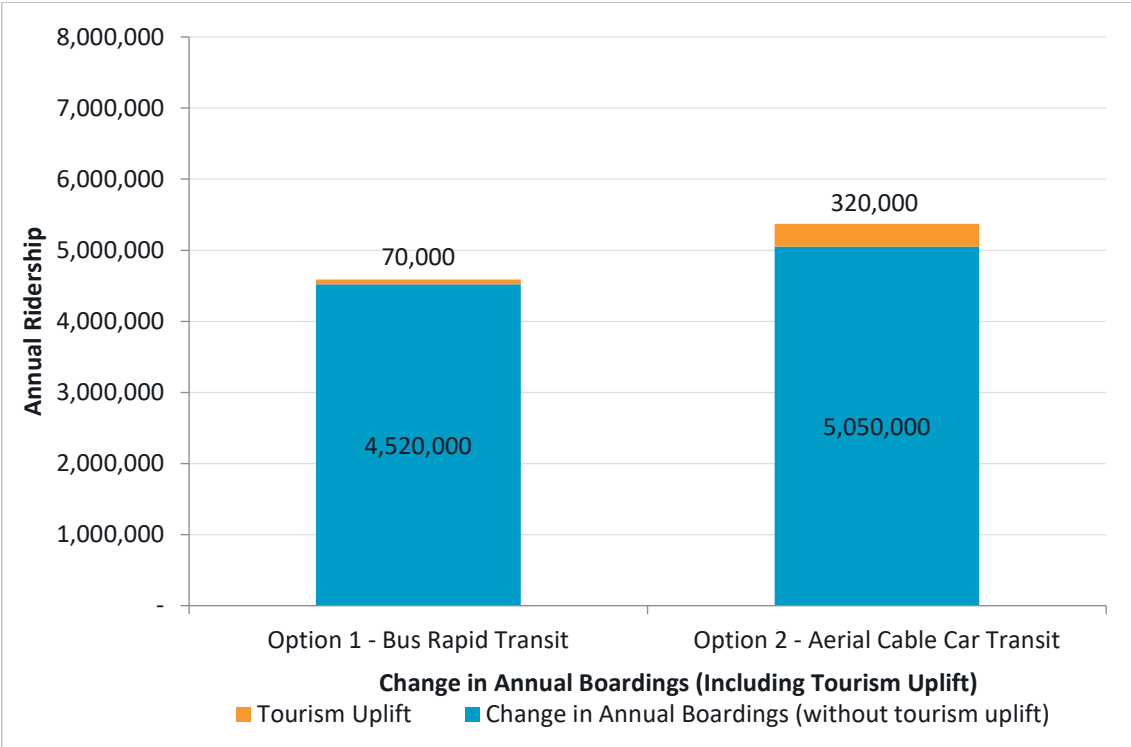
Can the BAU meet future demand?

Modelling confirmed that BAU bus routes will reach maximum capacity by 2051. The substantial demand realized by the rapid transit Options shows that ridership growth was suppressed by limited capacity, slow speeds, and lack of reliability in the BAU. Even though BAU buses in the peak operate at 5-minute headways, there is limited room to increase frequencies and capacity further without separating buses from general traffic and building extensive infrastructure.

Tourism uplift

ACCT systems in peer jurisdictions are used to support a range of travel types – including tourism. Tourists and novelty trips are typically not captured by transportation demand models like the GTAv4 model used to generate results for this IBC. Values were estimated separately from the model for this IBC drawing from international comparators, including the Portland Oregon Aerial Tram, and the La Paz Cable Car in Bolivia. A high-end and low-end ridership value uplift was calculated for each option based in part on the findings of the comparators systems, with the mean/median assumed for the tourism data ranges for reporting in the IBC. These averages equal 1% and 3% rider uplift, totalling 70 thousand and 320 thousand additional riders, for BRT and ACCT respectively. The scale of this uplift is shown in **Figure 4.1**.

Figure 4.1: Ridership Forecasts by Option

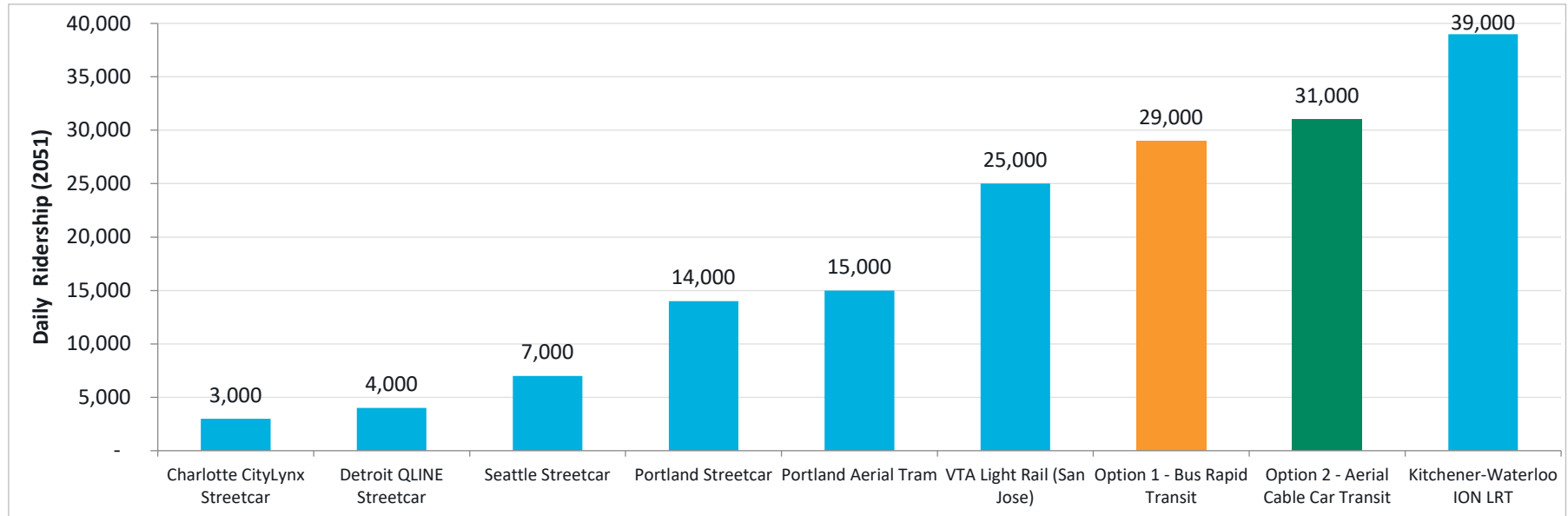


Comparator transit systems

To put the performance of options 1 and 2 into context **Figure 4.2** displays option performance compared to rapid transit systems in various North American cities. These comparators are a single or multi-part transit systems using either streetcar, LRT or a form of ACCT technology. These systems serve similar needs (rapid transit through a city centre) or settings (suburban cities in certain examples) to the proposed service in the Simcoe Street corridor. The daily ridership potential of Option 1 and 2 in 2051 stand out as among the highest across the comparator systems.

While ridership projections are for future year 2051, looking at the present in **Figure 4.2** shows how the City of Oshawa compares in population to the cities in which the comparator projects operate. This shows that Option 1 and 2 outperform on a per population basis relative to all other comparator cities which have populations orders of magnitude higher than Oshawa.

Figure 4.2: Benchmarking option ridership with comparator transit systems in 2051¹⁰



Population, 2023 (1,000)	910	630	760	650	650	970	190	190	670
Stations	17	20	17	72	2	78	18	17	19
Route Length (km)	6	5	6	12	1	68	14	14	19

¹⁰ Assuming 2% growth per year for comparator systems

Benefit 2 – Improved Reliability and Reduced Travel Times

Rapid transit systems can save up to 4 minutes on average per transit trip from or to the Simcoe Street corridor.

What is the benefit?

This benefit measures the changes in travel time on transit that Simcoe Street corridor users will experience between their point of origin and destination through one metric:

- **Change in average transit travel time:** times savings of an average transit trip to any destination along the corridor

This metric is calculated by looking at forecasted travel times from all areas, represented by zones along the Simcoe Street corridor in the model to all destinations. Travel times across all zones are averaged in each option and reported as the change in **average perceived transit travel time**.

Perceived travel time is a metric that directly impacts how users decide to make trips and select their mode of travel. It differs from actual travel time because it includes a users' perception of different trip components. Economic research shows that travellers value components of travel differently. For instance, wait time and walk time to transit are weighted heavier than in-vehicle travel times by travellers as they are perceived to take longer. Perceived travel time includes some components that are not considered in actual travel time but still make an impact on users' experience, such as reliability and crowding.

How do the options perform?

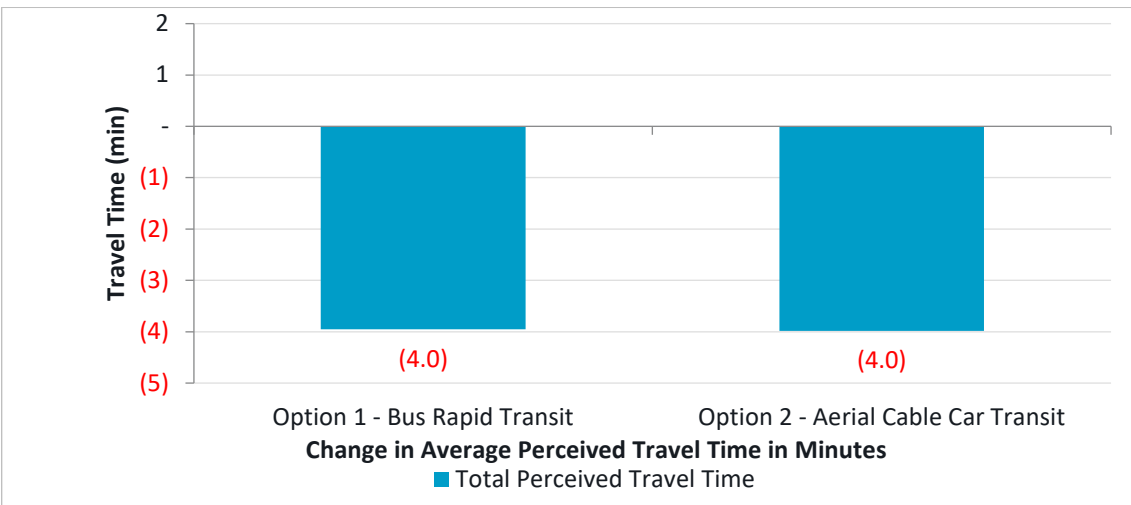
Both options will improve travel time for transit users compared to the BAU bus network as shown in **Figure 4.3**, which notes:

- **In-vehicle travel times:** BRT provides faster average operating speeds with 5 to 7 km/h faster than ACCT
- **Wait times:** ACCT has four times shorter headways than ACCT during the peak hour.
- **Walk times:** BRT has shorter walk times to reach the stations due to the technology specifications and specific locations of stations.
- **Crowding:** Both options performs similarly since they have similar capacity. ACCT has slightly higher crowding since it is forecast to have higher ridership.
- **Reliability:** Both options improve substantially over BAU with ACCT saving 8.5 minutes per trip and BRT saving 3.5 minutes per trip. BRT is less reliable than ACCT because it uses shared intersections with private automobiles. This means it can be impacted by congestion, collisions, and other traffic incidents. ACCT is completely grade separated with relatively simpler operations allowing it to achieve greater levels of reliability.

As a result, both options would better connect residents and commuters along the Simcoe Street corridor, resulting in similar performance of both technologies. **ACCT** technology avoids interaction with all other modes to provide better reliability, however the average speed is lower than BRT. While **BRT** is proven to be a faster technology with shorter walk times to stations, these benefits are offset by lower reliability and longer wait times.

Linking back to Benefit 1 on Increased Annual Transit Ridership, ACCT has greater ridership potential than BRT due to its higher frequency and reliability, which cannot be realized with buses or BRT.

Figure 4.3: Change in average transit travel time savings per trip



Benefit 3 – Efficient Mobility

ACCT generates \$6.7 million in annual operational cost savings and \$18.8 million in fare revenue, while BRT will increase operational costs by \$6.9 million and generate \$14.2 million in revenue. ACCT will reduce operational costs and generate higher revenues and overall surplus than BRT.

What is the benefit?

This benefit measures how options can operate a transit service at a lower cost to DRT through two metrics:

- **Change in annual operating costs:** the change in operating costs measured through transit vehicle kilometres travelled per option multiplied by an operating cost per kilometre parameter as well as considering additional factors such as staffing costs.
- **Change in annual revenue:** the change in revenue from ridership levels and the fares charged to different user types.

How do the options perform?

Both ACCT and BRT are forecasted to provide annual operating surpluses. The annual impact of the rapid transit options on overall financial efficiency in 2051 is illustrated in **Figure 4.4**, which notes:

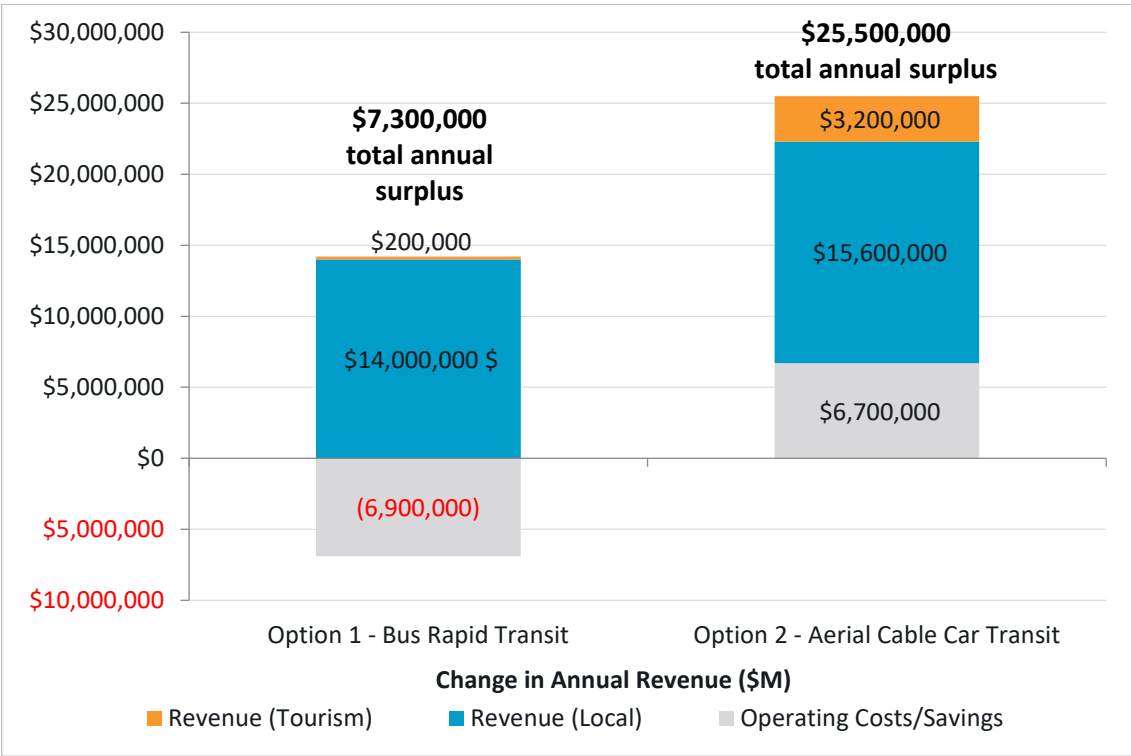
- **ACCT** results in a 2051 net revenue of \$25.5 million versus \$7.3 million for BRT; a difference of \$18.2 million:
- **ACCT** - \$25.5 million:
 - **ACCT** will have an annual operating costs decrease and result in a forecasted annual operating savings of \$6.7 million by 2051, represented as a positive value.
 - **ACCT** will generate \$18.8 million in total annual local and tourist fare revenues, an additional \$4.7 million in incremental revenue when compared to BRT. This is influenced by higher incremental local ridership with assumed fares of \$3.10, and almost five times higher tourism uplift with assumed fares of \$10.
- **BRT** - \$7.3 million:
 - **BRT** sees a \$6.9 million annual increase in operating costs, represented as a negative value, stemming from the greater number of buses and drivers required to operate the service at high frequencies.
 - **BRT** will generate \$14.2 million in total fare revenues.

How does ACCT result in operational cost savings?

The source of cost savings is two-fold. First, ACCT is a driverless technology. While the 17 planned ACCT stations in Option 2 will be staffed, the total number of staff and their associated costs is reduced compared to a BRT service given that drivers are not required in each cabin for this technology. Second, with ACCT replacing bus services along the Simcoe Street corridor, DRT will be able to operate fewer buses in their network.

ACCT outperforms BRT in achieving efficient mobility as seen in the Option's annual operating cost savings to DRT operations, higher revenue generating potential and higher operating surplus, directly tied to the higher forecasted ridership rates.

Figure 4.4: Rapid Transit Impact on Financial Efficiency of Transit Delivery in 2051 (2024\$)



4.2.2 Outcome 2 – Prosperity and Liveability

This outcome explores how the options can positively impact prosperity and liveability in the Simcoe Street corridor, Durham Region and beyond, while increasing its potential for all users. Prosperity and liveability are realized through economic and population growth that rises the wealth of the corridor while not increasing negative impacts. Three benefits have been identified for this outcome area:

- Benefit 4 – Job creation
- Benefit 5 – Rapid transit access to population and employment
- Benefit 6 – A healthier and more sustainable Durham Region

Benefit 4 – Job Creation

Deploying rapid transit on the Simcoe Street corridor can generate 10,000 – 13,000 full time equivalent (FTE) years of employment during project construction and delivery.

What is the benefit?

This benefit measures the job creation potential of each option during construction and delivery of the investment. Both options will require delivery works including demolition and removals, the construction of a transitway or Cable Car towers, stations and supporting infrastructure. To calculate how many new jobs will be created in the economy from each project an Input-Output model¹¹ is used. This is an approach that estimates the impact of project spending on the economy. The impact of the project will affect not only the construction industry but the entire economy through increased spending related to construction. Jobs created by the project are represented by Full-time Equivalent Employment (FTE). This is a metric which converts a total number of job hours into full-time jobs per annum.

How do the options perform?

Capital costs to deliver each option directly impact the number of jobs created during construction and delivery as illustrated in **Figure 4.5**, which notes:

- **BRT** can create an estimated 10,000 FTE years, while **ACCT** can add 13,000 FTE years.
- **ACCT** costs to build are higher than BRT, resulting in the creation of 3,000 more FTE years over the project's delivery phase. Because **ACCT** is more capital-intensive and takes less time to deliver it results in a more condensed economic impact during construction and therefore a greater job potential during project delivery.
- **BRT** has one additional station to deliver compared to ACCT, however the scale of the transit infrastructure required to deliver an ACCT system eclipses that of BRT.

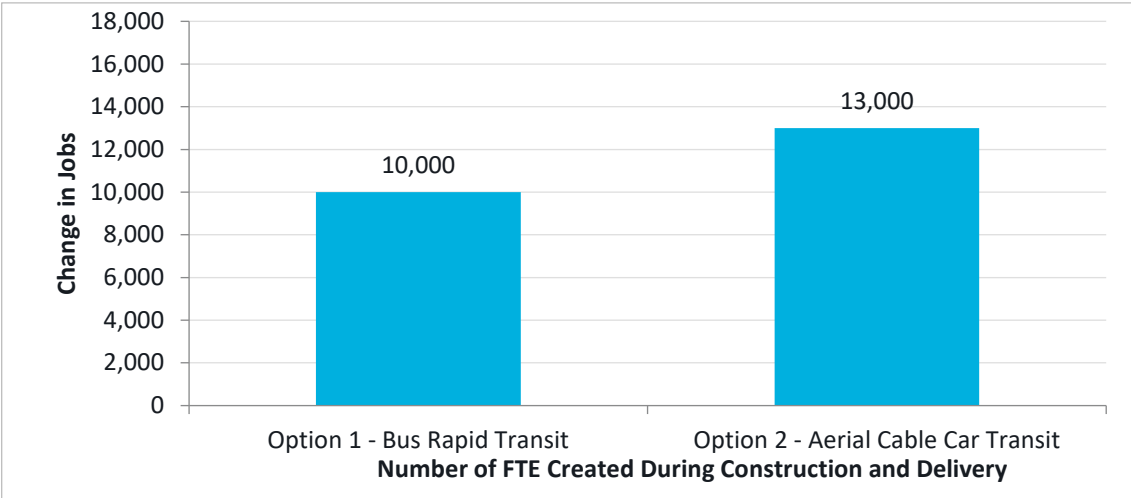
While both options can contribute to the economy by hiring locals, the higher job potential of ACCT contributes to the prosperity of the corridor, its residents and the entire regional economy.

What is the job creation impact within Oshawa of both options?

The number of FTE years of employment from ACCT would result in 2,400 jobs throughout the 5.5-year construction period, which would equate to almost 5% of current Oshawa's job market. For BRT the number of jobs would be equal to 1,300 during this phase due to the longer construction timeline of 8 years.

¹¹ OECD Input-Output Tables <https://www.oecd.org/en/data/datasets/input-output-tables.html>

Figure 4.5: Number of FTE years of employment created by the project during construction and delivery



A full summary of capital costs to deliver each option is provided in Chapter 5, subsection **Cost analysis**.

Benefit 5 – Rapid transit access to population and employment

Both Options expand the accessibility of rapid transit along the Simcoe Street corridor for up to 65,000-68,000 residents and up to 27,000-28,000 jobs.

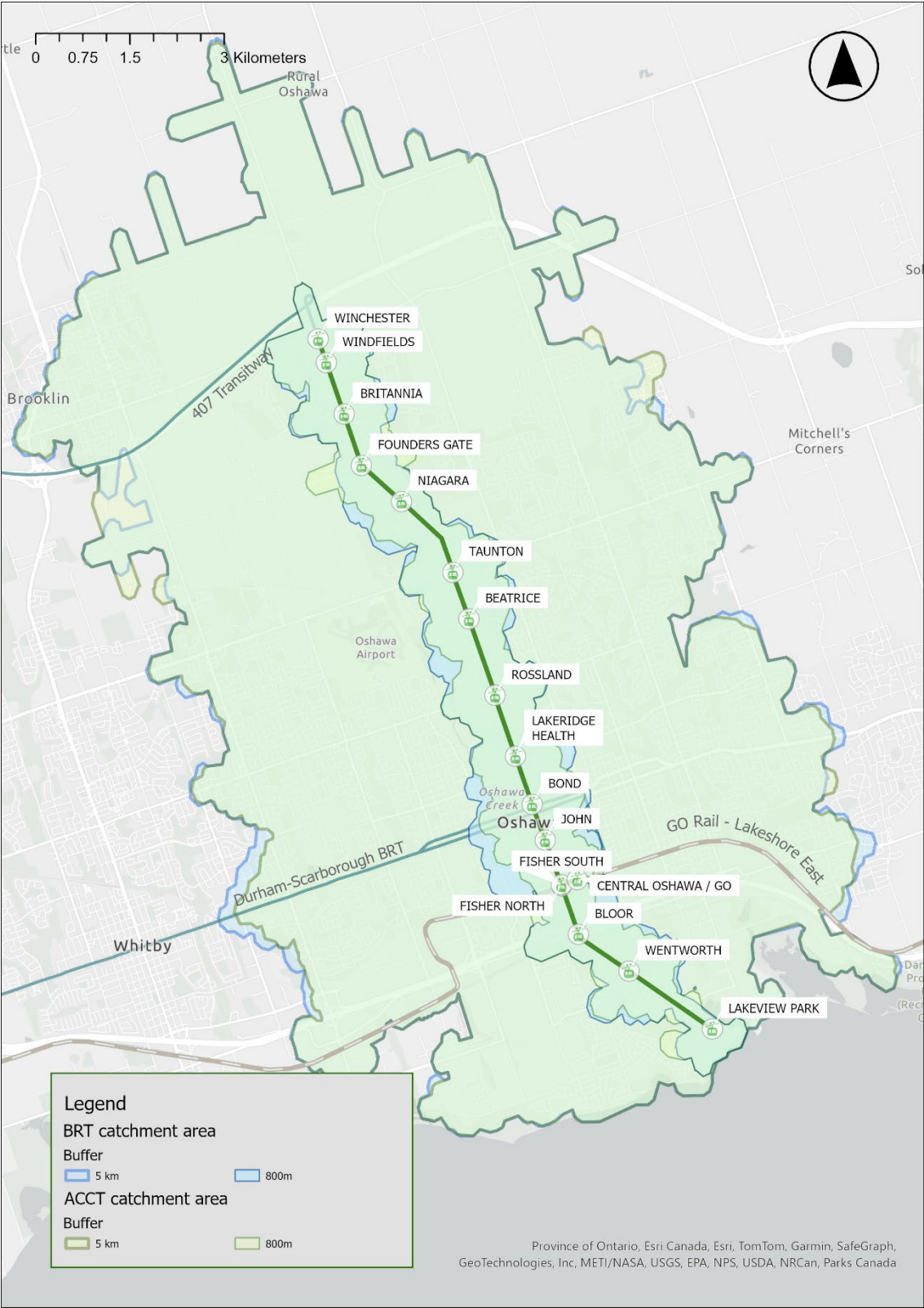
What is the benefit?

This benefit measures the new connectivity that each option can provide to residents and jobs and the resulting access potential to jobs for transit commuters through five metrics:

- **Change in residents within an 800-metres catchment of a rapid transit station**
- **Change in jobs within an 800-metres catchment of a rapid transit station**
- **Change in residents within a 5,000-metres catchment of a rapid transit station**
- **Change in jobs within a 5,000-metres catchment of a rapid transit station**

Connectivity is estimated for 2051 population and jobs residing within specified catchment areas, being 800 metres to represent comfortable walking distance for daily needs and 5 kilometres to represent a distance by which local transit trips to the Simcoe Street corridor can easily be made as a part of a complete transit network. The catchment areas begin at all stations in both options which act as points of accessibility for travellers. The 800-metre and 5-kilometre catchment areas for both options in relation to the Simcoe Street corridor is shown in **Figure 4.6**.

Figure 4.6: Catchment areas from BRT and ACCT stations with 800- and 5,000-metres station buffer



How do the options perform within 800- and 5,000-metre catchment areas?

Both ACCT and BRT will provide rapid transit access to new residents and jobs within both 800- and 5,000-metre catchment areas as shown in **Figure 4.7** and **Figure 4.8**, which note that:

- **ACCT** will provide new rapid transit access to 45,000 – 65,000 residents and 14,000 – 27,000 jobs within an 800- to 5,000-metre catchment area.
- **BRT** will provide new rapid transit access to 55,000 – 68,000 residents and 17,000 – 28,000 jobs within an 800- to 5,000-metre catchment area.
- **BRT** will serve 10,000 additional residents and 3,000 additional jobs within an 800-metre catchment area and 3,000 residents and 1,000 jobs within a 5,000-metre catchment area compared to ACCT.
- **BRT** has one more station than ACCT (18 versus 17) which drives option performance through expanded 800- and 5,000-metre catchment areas.

How many new people will be able to walk to rapid transit?

The project will provide new walking access to rapid transit for more than 45,000 residents, which is equal to 15% of Oshawa’s population in 2051.

The difference in option performance is minor and can be mitigated for ACCT through option alignment, local transit routing to the stations or greater density in catchment areas.

Figure 4.7: Change in Residents Within 800- and 5,000-metre Catchment of a Rapid Transit Station in 2051

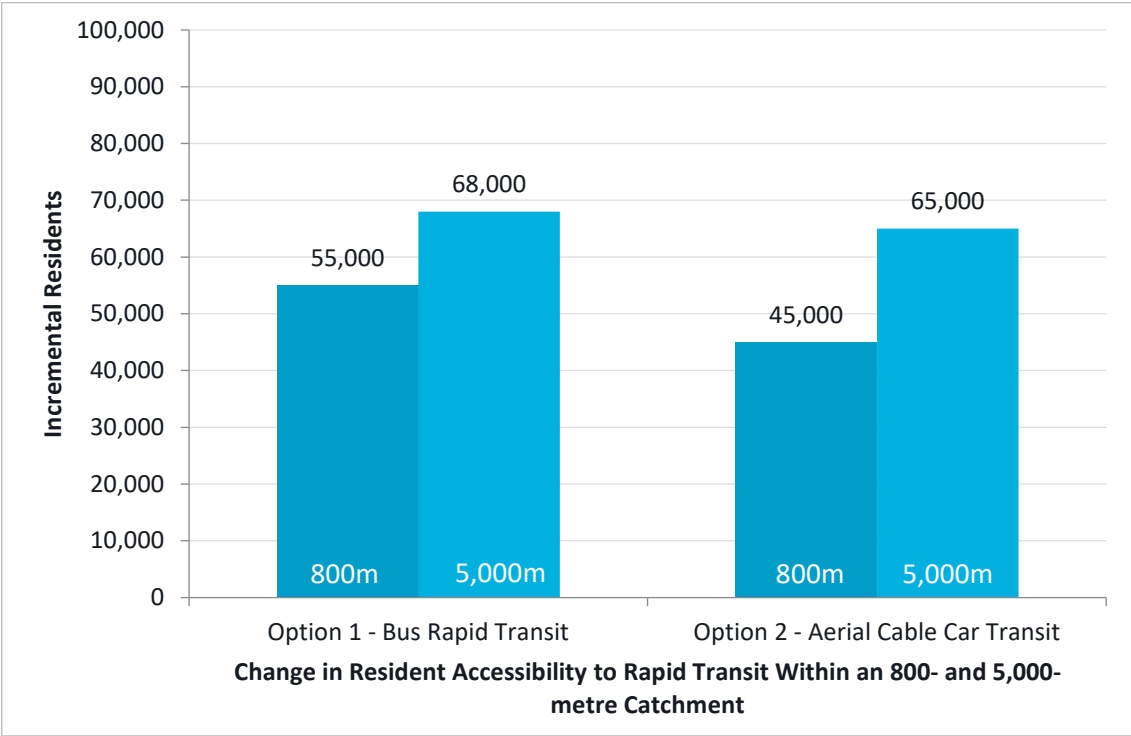
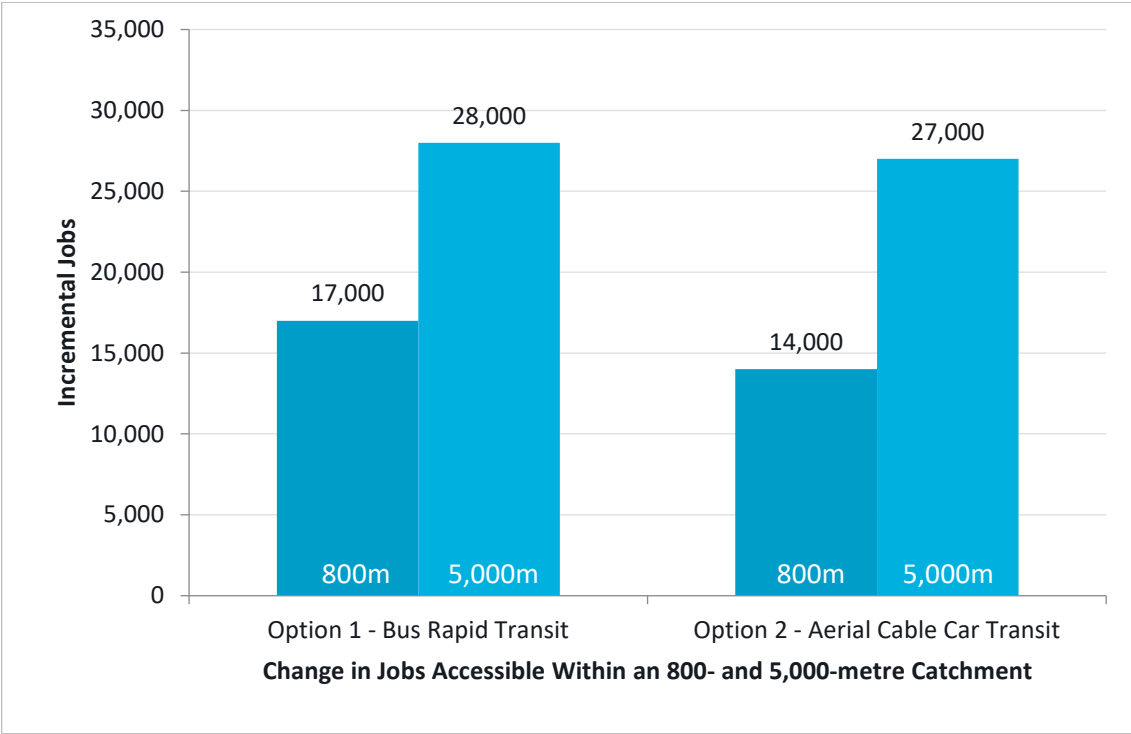


Figure 4.8: Change in Jobs Within 800- and 5,000-metre Catchment of a Rapid Transit Station in 2051



Both options are forecasted to increase total transit capacity along the corridor by 350% and by providing access to rapid transit. Either investment will enable a significant opportunity to add more population and employment density with quick access and proximity to the regional rapid transit network.

Benefit 6 – A Healthier and More Sustainable Durham Region

ACCT can reduce negative impacts of driving on society and the environment, removing 11 annual auto collisions, reducing GHG emissions by 81,400 tonnes and decreasing multiple air pollutants.

What is the benefit?

This benefit explores how rapid transit can enable a healthier and more sustainable region. This is measured by the change in annual auto vehicle kilometres travelled (VKT) as travellers switch to rapid transit. Improved local transit services provided in each option have the potential to not only attract new trips and riders to their services, but also the ability to switch existing drivers in the transportation network to transit. This modal shift will result in fewer auto VKT per year which will in turn reduce negative health and environmental impacts in the corridor, Oshawa and Durham Region, which are evaluated across three metrics:

- **Change in annual auto collisions resulting in injury or fatality:** estimated based on the frequency of such events per auto VKT. This benefit measures the reduction in VKT and collisions for auto traffic in the transportation network. It does not measure VKT and collision potential for buses in Option 1 – BRT nor cable cars in Option 2 – ACCT (which will not come into conflict with any vehicle traffic due to the elevated nature of the technology).
- **Change in annual tonnes of GHG emissions:** calculated by a GHG emissions rate per auto VKT tied to fuel efficiency and fuel usage.
- **Change in annual air pollution:** calculated based on an assumed emission rate per kilometre of travel by automobile. The pollutants covered by this metric are carbon monoxide, nitrogen oxides, volatile organic compounds, fine particulate matter, sulphur oxide and ammonia.

How do the options perform?

Both options are forecasted to reduce auto VKT through mode shift of drivers to transit as summarized in **Table 4.2**, which notes:

- **ACCT** will reduce annual auto VKT by 35.4 million km in 2051. **ACCT** has a greater VKT reduction than BRT due to two reasons - higher option ridership and lower levels of remaining auto users rerouting their trips. **ACCT** higher ridership results in more transportation network users switching from auto use to transit use.
- **BRT** will reduce annual auto VKT by 6.8 million km in 2051.
- **BRT** layout of infrastructure along the Simcoe Street corridor will result in the loss of general traffic lanes on Simcoe Street. This will impact remaining auto-based trips, causing some rerouting of these auto trips that will result in longer distances travelled.
- **ACCT** performance results in an auto VKT reduction five times larger than that of BRT with a delta in performance of 28.6 million in VKT reduction, resulting in a greater number of reduced auto accidents causing injury or fatality and reduced GHG and air pollution emissions.

Both options contribute positively to the aims of Outcome 2, however, ACCT has significantly stronger performance and mitigates these negative health and sustainability impacts at a rate more than five times higher than BRT.

Table 4.2: Change in annual auto collisions resulting in injury or fatality, tonnes of GHG emissions and air pollution

Metric	Metric Disbenefit	Option 1 – BRT	Option 2 – ACCT
Change in annual auto collisions resulting in injury or fatality	Injury or death	-2	-11
Change in annual GHG emissions (tonnes)	Emissions resulting in climate change	-15,700	-81,400
Change in annual air pollution (kg)			
Carbon monoxide (CO)	Impairs oxygen delivery, causes health issues	-8,228	-42,738
Nitrogen oxides (NO _x)	Causes smog, acid rain, respiratory problems	-622	-3,231
Volatile organic compounds (VOCs)	Forms ground-level ozone, harms lungs	-773	-4,013
Fine particulate matter (PM)	Triggers respiratory, cardiovascular diseases, visibility issues	-18	-94
Sulphur oxides (SO ₂)	Leads to acid rain, harms ecosystems, health	-4	-21
Ammonia (NH ₃)	Contributes to smog, fine particles, ecosystem damage	-46	-240

4.2.3 Outcome 3 – Housing and Development

The third outcome explores how options can encourage and facilitate greater housing and development in the Simcoe Street corridor. Development can be realized by the provision of new housing stock on the Corridor in proximity to rapid transit. One benefit has been identified for this outcome area: access to housing development opportunities

Benefit 7 – Access to housing development opportunities

Both Options provide access to similar areas of land suitable for housing development within a short walking distance from rapid transit stations.

What is the benefit?

This benefit measures the availability of suitable land parcels for housing development within proximity of the proposed rapid transit stations in each option. Being one of the few corridors in the GGH with higher order transit, Simcoe Street might see an increase in development interest to help address the GGH's housing shortage. Uncovering this potential demand would require access to suitable land that is zoned for future development and within a short walking distance from the stations.

This metric is estimated based on an analysis of corridor-adjacent lands and current zoning within 500 metres from all proposed stations, which is considered as a buffer with the highest potential for transit-oriented development. Parcels are considered suitable for development if they are zoned by the City of Oshawa as mixed-use, higher density residential or commercial.¹²

How do the options perform?

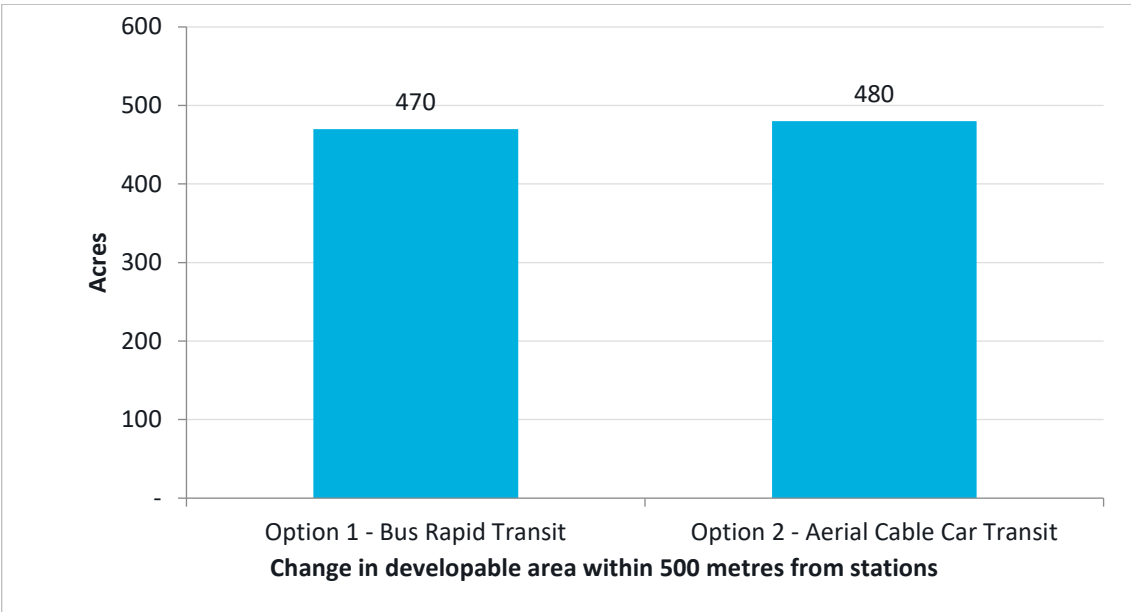
Both options provide access to similar areas along the Simcoe Street corridor as summarized in **Figure 4.9**, which notes:

- **ACCT** and **BRT** will provide access to between 470 and 480 acres of developable land within 500m of option stations.
- **ACCT** relative differences in station locations results in slightly better performance potential.

Both ACCT and BRT investments put the Simcoe Street corridor on the regional map for high-density development potential. As project assessment advances, further review of the parcels of developable land can be conducted to assess development potential. Some parcels may be better suited for higher density residential development than others and could provide further indication as to which Option can provide more access to more homes.

¹² Mixed-use, higher density residential and commercial are defined as MU, PCC, PSC, SPC, CC, HBC, HMC, CBD, R4, R5, R6, SO, OC

Figure 4.9 Developable area within 500 metres of rapid transit stations



4.3 Strategic Case Summary

How do options perform at a strategic level?

Table 4.3 provides a summary of option performance across the seven strategic benefits. This analysis finds that ACCT has stronger alignment with Oshawa, Durham Region, and broader regional and provincial policy than BRT.

The core findings of this analysis are:

- Efficient and connected mobility: ACCT has the potential to provide higher ridership and revenues to the corridor while leading to cost savings versus bus-based infrastructure;
- Prosperity and livability: ACCT will deliver more job years during project delivery and remove more cars off corridor roads, resulting in higher levels of health, safety and environmental benefits; and
- Housing and development: Both Options will provide access to similar size of developable land along Simcoe St corridor, with ACCT reaching more developable plots of land, which will support future housing projects in the Region.

Table 4.3: Strategic case summary (2051)

Outcome	Benefit	Metric	Option 1 – BRT	Option 2 – ACCT	Conclusion
1. Efficient and Connected Mobility	Benefit 1 – Increased Annual Transit Ridership	Change in annual boardings (including tourism uplift)	4,590,000	5,370,000	ACCT has higher ridership
	Benefit 2 – Improved Reliability and Reduced Travel Times	Change in average transit travel time per trip	-4.0	-4.0	Comparable time savings
	Benefit 3 – Efficient Mobility	Change in annual operating costs (\$ millions)	\$6,900,000	(\$6,700,000)	ACCT is less expensive to operate and results in operating cost savings
		Change in annual revenue (\$ millions)	\$14,200,000	\$18,800,000	ACCT has a higher fare revenue potential
2. Prosperity and Liveability	Benefit 4 – Job Creation	Number of full-time job years created by the project (FTE)	10,000	13,000	ACCT can generate more years of employment
	Benefit 5 – Rapid transit access to population and employment	Change in residents within 800- and 5,000-metre catchment of a rapid transit station	55,000 - 68,000	45,000 - 65,000	Comparable connectivity to residents within 800 and 5,000 metres
		Change in jobs within 800- and 5,000-metre catchment of a rapid transit station	17,000 - 28,000	14,000 - 27,000	Comparable connectivity to jobs within 800 and 5,000 metres
	Benefit 6 – A healthier and more sustainable Durham Region	Change in annual auto collisions resulting in injury or fatality	-2	-11	ACCT results in fewer auto collisions and resulting injuries

Outcome	Benefit	Metric	Option 1 – BRT	Option 2 – ACCT	Conclusion
		Change in annual GHG emissions (tonnes)	-15,700	-81,400	ACCT has greater GHG reductions
		Change in annual air pollution, such as fine particulate matter (PM)	-18	-94	ACCT reduces more air pollutants
3. Housing and Development	Benefit 7 – Access to housing development opportunities	Area suitable for housing development within 500m from a rapid transit station (Acres)	470	480	Comparable access to similar land areas suitable for housing development

Sensitivity Testing

Sensitivity testing is the process of identifying the impacts of variations to specific assumptions or inputs on performance of evaluated options. This Business Case has conducted only limited testing with two sets of analysis applied to Option 2 – ACCT.

Speed increase for ACCT

ACCT included in this IBC has an average speed of 20-21 km/h. The TRI-line technology, which was selected as a preferred technology for ACCT, currently has a speed limit of 25 km/h when operating between stations. Considering that the TRI-Line is a relatively new technology that has been in operation for only two years, as well as assuming that the construction on the potential system is not planned to begin until 2029, there is the potential that the technology will improve, and that the system will be able to support higher operational speeds.

Impacts - This sensitivity test applied an average operating speed for ACCT increased by 5 km/h to 25 km/h. Results demonstrate growth in boardings by 15%, increasing daily ridership from 31,000 to almost 36,000. The increase in ridership will further improve the competitiveness of ACCT and will lead to a corresponding increase in most of benefit categories.

Student enrollment increase for ACCT

The student population is a key group of transit users in the Simcoe Street corridor. Based on the DRT's Route Ahead, post-secondary travel market makes up 25% of transit trips in the Region. Durham College and Ontario Tech have two major campuses along the street, North Campus on Conlin Road and a smaller Downtown Campus, and Trent University has their Durham GTA Advanced Learning Centre in Downtown Oshawa as well.

Student growth assumptions used in the IBC analysis assume no major increase in the enrollment until 2051. The Colleges however have an ambitious growth plan and are targeting to increase total student enrollment from around 20,000 today to above 50,000 students by 2051. The goal of this test is to estimate the impact of an increased student population on both the Business as Usual and ACCT options' performance.

Impacts - ACCT adds 4,000 new daily boardings compared to the version with no student growth assumption applied. This raises total daily boardings to 35,000 passengers from 31,000. Incrementally, ridership increases by an additional 1,300 boardings, or by 8%, compared to the BAU which would see 2,700 new boardings and total daily boardings of 16,600. While this test was not applied for BRT in Option 1, a similar increase in ridership growth would be the expected result.

5 Economic Case

Chapter overview

The economic case determines the costs and benefits associated with delivering the proposed investment via the two assessed options. It allows decision makers and potential partners to understand the extent of each investment options benefit and cost to society.

The Economic Case is one of two cases (the other being the Strategic Case) focused on the rationale for pursuing an investment. However, unlike the Strategic Case, which displays results for a single year (2051) the Economic Case presents results across the entire project lifecycle (60 years).

5.1 Approach and Assumptions

The Economic Case calculates benefits and costs over a 60-year project lifecycle (the evaluation period) to determine if the value of benefits exceed the value of costs relative to the BAU. The evaluations results in two key performance metrics to compare performance between options:

- **Benefit Cost Ratio (BCR):** net benefits divided by net costs over the project lifecycle. This metric is used to show the relative magnitude of benefits versus costs and the value for money proposition of an option. A BCR greater than one means that every dollar spent on cost results in over a dollar of benefit. For example, a BCR of 1.5 means that for every dollar spent on a project it would generate \$1.50 in benefits for society.
- **Net Present Value (NPV):** communicates total value for money generated by an option in absolute terms. This metric is calculated by subtracting total net present benefits by net present costs over the appraisal period in present value. If an option's NPV is greater than 0 it is considered economically beneficial.

All values presented in the Economic Case are in real terms. This means that values include a social discount rate and the impact of real growth but do not include the impact of general inflation. All assumptions that inform the Economic Case analysis are listed in **Table 5.1** and are informed by GGH business case evaluation practice as per the Metrolinx Business Case Guidance.

Table 5.1: Economic Case Assumptions

Input	Parameter
Value of Time (2024\$)	\$19.55/hour
Discount rate	3.5%
Real inflation rate	1%
Appraisal period	2034-2093 (60 years of operations)
Ridership growth rate	2% (until growth cap in 2061) with some assumptions to account for Novelty demand in the first 5 years of operations ¹³
VKT direct cost (2024\$)	\$0.06
GHG Emissions per VKT (2024\$)	\$0.011
Road Safety per VKT (2024\$)	\$0.10
Local air quality per VKT (2024\$)	\$0.002
Social Health per kilometre walked (2024\$)	\$4.54

5.2 Economic Case Analysis

5.2.1 Cost analysis

The costs required to deliver each option are presented in this section. Costs are incremental to the BAU and are broken down into two categories summarized in **Table 5.2**.

¹³ Applied the following factors to ridership: 1.1 in 1st year, 1.075 – 2nd, 1.05 – 3rd and 1.025 in the 4th and 5th.

Table 5.2: Economic Case cost categories

Cost Category	Description	Assumptions
Capital and Renewal Costs	All one-time fixed costs to deliver the key infrastructure for each option as well as infrastructure renewal costs incremental to the business as usual (BAU - or no project) scenario. Costs and duration of construction were determined by feasibility studies for both Cable Car and BRT technologies, are preliminary in nature and subject to further refinement as detailed design of project options progresses.	- One-time fixed costs include in-line and terminal stops/stations and running way, rolling stock, maintenance facility, property purchase, utilities relocation, and engineering. - Infrastructure renewal costs incurred throughout operations of the transit system.
Operation and Maintenance Costs	Includes the on-going daily costs required to operate and maintain the transit system incremental to the BAU.	- Include costs of labour, energy, vehicle and facility maintenance, and materials and supplies - Option operating cost assumptions are listed in Table 3.2

5.2.2 Benefit Analysis

The benefits to society of each option across the project lifecycle are assessed in the economic case across two benefit categories summarized in **Table 5.3**.

Table 5.3: Economic Case impact categories

Impact Category	Description	Benefit categories
User Impacts	Covers the benefits transit users receive who will use the new rapid transit investment on the Simcoe Street corridor and auto users in the transportation network who will benefit from other travellers shifting modes to transit.	- For transit users, user impacts are the monetized reduction in travel times for their journeys - For auto users, benefits are captured in monetized auto operating cost savings and decongestion benefits due to fewer cars being on local roads
External Impacts	Covers the benefits generated by each option that will be realized across society, and not just to transit users or auto network users.	External impacts are all monetized and include: - Safety benefits in the road network – capture the reduction in auto accidents causing injury or death due to a decrease in auto VKT - GHG emission reduction benefits - Air quality improvement benefits. GHG emission reductions and air quality improvements capture the benefit of reduced auto use in the transportation network.

5.3 Economic Case Summary

How do options perform at an economic level?

Table 5.4 provides a summary of economic costs and benefits for both options across a 60-year project lifecycle.

Table 5.4: Economic case summary (million 2024\$)

Category		Option 1 – BRT	Option 2 – ACCT
A	Costs (B+C+D)	\$780	\$780
B	Capital Costs	\$580	\$840
C	Renewal Costs	\$70	\$90
D	Operating and Maintenance Costs (E+F)	\$130	-\$150
E	Rapid Transit	\$530	\$300
F	DRT	-\$400	-\$450
G	Benefits (H+I+J+K+L)	\$270	\$660
H	Transit User Impacts	\$180	\$240
I	Auto User Impacts	\$20	\$130
J	Health	\$60	\$210
K	Road safety - Deaths	\$10	\$70
L	Environmental Impacts	\$2	\$9
	Benefit Cost Ratio (BCR) (G/A)	0.35	0.84
	Net Present Value (NPV) (G-A)	-\$510	-\$120

The following economic case findings are drawn from the analysis in **Table 5.4**:

- **Costs** – both options have comparable total lifecycle costs over construction and 60-years of operating. ACCT carries higher capital costs than BRT (\$840 m compared to \$580). However, ACCT is forecast to generate a lifecycle saving of \$150m in operating costs, while BRT requires an additional \$130m in operating subsidy over the 60-year operating period. ACCT operational savings occur due to reduced labour requirements (station attendants vs drivers on each vehicle in the case of BRT) and more cost-efficient vehicle operations.
- **Benefits** – ACCT is forecast to generate \$660m of benefits over the first 60-years of operations, compared to \$270m for BRT. This means ACCT can generate nearly 2.4 times the level of benefit of BRT on the Simcoe Street corridor. ACCT's higher benefits are largely driven by three factors – significantly higher ridership (see section 4.2.1), aerial cable car technology is more reliable than BRT, and increased health benefits relative to BRT. Ridership forecasts suggest that ACCT will lead to higher levels of walking by users to access stations – on average 170m longer than for BRT, resulting in higher levels of benefit.

Reliability

Reliability is a measure of how consistent travel time (inclusive of waiting time, in vehicle time, and access time). Improvements to reliability are a benefit, while reduced reliability is a disbenefit.

Economic research shows that travellers value a minute of reliability improvement by 1.76 x as much as they would value a minute saved of in-vehicle time. For example, an individual would derive more value from a 1-minute increase in reliability on a journey that typical takes 10 minutes, than they would a 1.5-minute saving on a journey that is 9 minutes.

Both options are more reliable than the existing bus network, however BRT is less reliable than ACCT because it still has interactions with intersections used by general traffic. As a result, BRT travel times are impacted by congestion, collisions, and other traffic events. ACCT is fully grade separated with simpler operations and can achieve a higher level of reliability.

When all economic costs and benefits are considered, ACCT produces a BCR of 0.84 compared to 0.35 with BRT and has a NPV \$390 million greater in value than BRT. This means that for every dollar spent, ACCT produces almost half a dollar more in benefits to society than BRT. Further optimization of ACCT, including achieving faster speeds or optimized design, may result in an improved BCR.

How can performance be further optimized?

The ACCT option has BCR of 0.84, which suggest optimization and expanded analysis could result in a BCR above 1. Optimization could include:

- Value engineering and cost optimization – exploring opportunities to reduce the capital costs of the project through the detailed design and construction phases of the project.
- Benefits optimization – identifying ways to further augment the benefits realized by travellers. This could include the use of faster cable car technology (see sensitivity tests for an example of increased average speed from 20 to 25 km/h), improved customer experience at stations (example: high-value but cost efficient design features that augment amenity), and alignment with land use planning (for example: deploying land use changes and ACCT together to increase ridership).
- In addition, future analysis could consider the inclusion of wider-economic benefits (such as agglomeration) which may capture benefits not included in this IBC.

6 Financial Case

Chapter overview

The Financial Case assesses the overall financial impact to deliver the proposed investment options. The Financial Case answers the following questions:

- How much will it cost to build, operate and maintain the investment?
- What is the net financial impact of the investment to the authority delivering the project?

How does the Financial Case differ from the Economic Case?

The Financial Case is concerned with the costs and potential revenues to the authority responsible for delivering the project while the Economic Case covers the costs and benefits of the options to society.

6.1 Financial Analysis

The Financial Case includes estimates of the revenue impact (due to changes in ridership), and costs (capital, operating and maintenance) required over the 60-year project lifecycle incremental to the BAU. The evaluation results in two key performance metrics to compare performance between options:

- **Operating Costs Recovery Ratio:** measures the percent to which the annual revenues generated by the project can recover generated operating costs.
- **Total Financial Impact:** a comparison of total financial revenues compared to total financial costs of the investment.

All values presented in the Financial Case are in nominal terms, meaning that values are inflation-adjusted and reflect the expected cost of a good or service in the year of expenditure. A financial discount rate is applied to values in this analysis to reflect the changing cost of the project over time.

Assumptions that informed the Economic Case analysis are listed in **Table 6.1** and are informed by GGH business case evaluation practice as per the Metrolinx Business Case Guidance or the Region of Durham.

Table 6.1: Financial case assumptions

Input	Parameter
Discount rate	5.5%
Inflation rate	2%
Appraisal period	2034-2093 (60-years of operations)
Local fare	\$3.10
Tourist fare (only option 2)	\$10.00

6.1.1 Cost and Revenue Analysis

Two costs categories to deliver each option are captured in this analysis along with one revenue category. Costs and revenue are incremental to the BAU and are broken down into three categories summarized in **Table 6.2**.

Table 6.2: Financial Case cost and revenue categories

Category	Description	Assumptions
<i>Costs</i>		
Capital Costs	All costs to deliver the infrastructure for each option incremental to business as usual (no project). Cost estimates are based on detailed assumptions on construction, utility relocation, property purchase, fleet and engineering costs	One-time fixed costs include in-line and terminal stops/stations and running way, rolling stock, maintenance facility
Operating and Maintenance Costs	Includes day-to-day operations of vehicles and maintenance of the fleet and general infrastructure incremental to the BAU.	- For bus operations, the number of hours, size of fleet and associated financial impact of these operations for both options was calculated using service characteristics, such as frequency, travel time, and distance per bus route, and a set of assumptions provided earlier in Chapter 3, Table 3.2. - ACCT costs were estimated in the Cable Car Feasibility Study (2024)

Category	Description	Assumptions
		Option operating cost assumptions are listed in Table 3.2
<i>Revenues</i>		
Transit Revenues	Increased far revenues compared to the BAU.	- Calculated by applying an average fare to the incremental ridership for each option - For both options it was assumed that local riders would pay a flat fare of \$3.10 per trip - Tourist and novelty riders seeking to use the ACCT investment pay a \$10 fare to capitalize on the tourist and novelty trip generation potential of the ACCT technology - It remains to be confirmed how the two-tiered fare policy will be implemented and enforced. International examples of cable car systems with dual fare structures exist that could serve as reference.

6.2 Financial Case Summary

How do options perform in financial terms?

Financial cost and revenue performance of both options is summarized in **Table 6.3** for both options under consideration across a 60-year project lifecycle, and notes:

- ACCT will require an additional \$770 million to deliver beyond capital expenditure in the BAU, with an operating and maintenance cost savings of -\$90 million, resulting in total option costs of \$740 million.
- BRT is estimated to cost an additional \$530 million to deliver beyond capital expenditure in the BAU and have renewal costs over the project lifecycle of \$30 million, a \$240 million cost savings relative to ACCT.
- BRT technology would require the running of a costly bus fleet, whereas ACCT would result in a reduction in bus operations, resulting in operating and maintenance cost savings totalling \$170 million relative to BRT.
- ACCT has the potential to generate fare revenues of \$200 million compared to the BRT total of \$170 million due to its higher ridership (see Section 4.2.1).
- ACCT has an operating cost recovery ratio above one at 1.02 as the project's operating costs are lower than the forecasted fare revenue, versus an operating cost recovery ratio of 0.51 for BRT, meaning that it will require a subsidy to cover approximately half of its operating and maintenance costs.

When all financial costs and revenues are conserved, BRT costs less to deliver while ACCT produces operating and maintenance costs savings and an Operating Costs to Revenue ratio above one and has a total financial impact of \$70 million more than that of BRT.

Table 6.3: Financial case summary (\$ millions)

Category		Option 1 – BRT	Option 2 – ACCT
A	Costs (B+C+D)	\$640	\$740
B	Capital Costs	\$530	\$770
C	Renewal Costs	\$30	\$60
D	Operating and Maintenance Costs (E+F)	\$80	-\$90
E	Rapid Transit	\$320	\$190
F	DRT	-\$240	-\$280
G	Revenue	\$170	\$200
	Operating Costs Recovery Ratio (G/D)	0.51	1.02
	Total Financial Impact (G-A)	-\$470	-\$540

7 Deliverability and Operations Case

Chapter overview

The Deliverability and Operations Case is an analysis of investment governance, delivery, operations and maintenance, commercial matters and any other considerations and risks that need to be considered before selecting a preferred option. This includes delivering the project from original concept through to planning, design, environmental assessment, engagement, procurement, construction and operations. The Deliverability and Operations Case is one of two cases (the other being the Financial Case) focused on requirements for delivering the investment.

It includes the following sections:

- Governance;
- Deliverability Considerations;
- Operational and Maintenance Considerations;
- Commercial Considerations; and
- Deliverability and Operations Case Summary.

7.1 Governance

Project governance defines the roles, responsibilities, and relationships required to advance the project through planning, construction, and operations. This section outlines governance considerations that are common to both options and identifies any option specific considerations.

The governance structure of the project should be determined from its outset. This will confirm roles and responsibilities, and which party has decision-making authority across project development, delivery and operational stages.

The governance of transit infrastructure capital project delivery in the GGH involves various actors. These actors and their roles are summarized in **Table 7.1**.

Table 7.1: Project governance actors

Actor	Governance Role
Project Owner	Responsible for the overall success of the project, ensuring its delivery and that the desired outcomes of the project are realized
Project Funder(s)	The actor(s) responsible for providing funding to plan, construct, operate and maintain the project
Project Procurer	Responsible for procurement and commercial management of project contracts
Project Deliverer	The actor(s) responsible for supplying project infrastructure, its construction and commissioning
Project Operator	Responsible for operating the project once in service as well as potentially the maintenance of project assets

Option Comparison

Option specific considerations will impact the governance structure of the project. BRT operational and maintenance responsibilities could be assigned to existing parties with experience operating this technology in the region. Whereas ACCT infrastructure delivery might be coupled with operation and maintenance responsibly of the service given the supplier familiarity with the technology.

The Project Owner will also have to work with multiple impacted and interested external parties to enable successful project delivery. An overview of these relevant project partners is provided in **Table 7.2**.

Table 7.2: Project partner overview

Project Partner	Overview
Indigenous communities	The Region has a duty to consult with Indigenous Communities. Indigenous Communities may be interested due to the natural heritage features located along/near the corridor and in future environmental assessment background papers. Indigenous communities should be engaged throughout the project.
City of Oshawa	The City of Oshawa is responsible for managing land use policy and development activities along the corridor, both of which are critical enablers in the success of this investment. The City is also responsible for the local roadways that intersect with Simcoe Street.

Project Partner	Overview
Ministry of Transportation of Ontario (MTO)	The involvement of MTO is required as the project may enter the permit control area of Highways 401 and 407 and cross over Highway 401.
Infrastructure Ontario (IO)	Infrastructure Ontario acts as the procurement and commercial lead for all major public infrastructure projects in the province. It leads or provides procurement advice to municipalities during the procurement phase.
Metrolinx	Metrolinx is mandated to coordinate, plan, finance, develop, and implement an integrated transit network in the Greater Golden Horseshoe. They also operate the GO Rail and GO Bus transit systems and will deliver the future Central Oshawa Ritson Road GO Station and potentially the Highway 407 Transitway (in collaboration with MTO).
Central Lake Ontario Conservation Authority	The Simcoe Street corridor crosses lands within the Regulated Area near Valley Drive, Highway 401, Cedar Valley Conservation Area and Winchester Road. Oshawa Creek also runs parallel to Simcoe, typically between 200 to 800 m to the west.
Transport Canada and Nav Canada	The Simcoe Street corridor is close to the Oshawa Executive Airport. To understand design implications for an aerial transit option, the Region should consult with Transport Canada and Nav Canada, which owns and operates Canada's civil air navigation system.
Utilities Companies	Including but not limited to Hydro One, Oshawa Power & Utilities Corporation, Enbridge, and telecommunications companies, all of whom may have existing assets in the corridor that may be impacted by investment delivery and operations.
Institutional Partners	Three major post-secondary and healthcare institutions operate campuses along the Simcoe Street corridor including Durham College, Ontario Tech University and Lakeridge Health Oshawa (including the Durham Regional Cancer Centre).

7.2 Deliverability Considerations

This section contains a qualitative assessment of complexities relating to deliverability for each of the proposed options. These considerations are organized into the three categories summarized below and are examined in detail in **Table 7.3**:

- **Feasibility:** high-level considerations of the proposed transit options
- **Delivery:** considerations for the modifications and construction of the options
- **Risks:** Potential considerations that could prevent successful delivery of the options

Table 7.3: Deliverability Considerations Summary

Option	Feasibility	Delivery	Risks
Option 1 – Bus Rapid Transit	- Highway 407/Winchester Terminal: coordination is required with MTO to advance planning and design of a transit terminal at the northern terminus of the corridor. The terminal should provide a seamless transfer experience between the 407 Transitway, rapid transit corridor and any other local or regional services. Providing a signalized intersection onto Simcoe Street requires coordination with MTO due to highway ramp proximity. - Securing an Operations Maintenance and Storage Facility (OMSF) Site: existing DRT facilities cannot accommodate a new BRT fleet. Further work required to investigate expanding an existing facility or securing a new site. - Right-of-Way Constraints: sections of the corridor are constrained and may limit the ability to accommodate stations and/or widen the roadway.	- The Simcoe Street right-of-way will need to be widened in some places to accommodate dedicated bus lanes, new turn lanes and bus stations. This will impact some properties, on-street parking, and driveways along the corridor, specifically in more mature neighborhoods with buildings closer to the existing curbs. - There are 18 BRT stations planned along the corridor with an average spacing of 780m – almost double that of Business as Usual. This aligns well with some BRT routes in the region such as planned Durham-Scarborough BRT. - Delivering a fully electrified system at this scale might require some additional assessment of local power grids capacity. - BRT infrastructure could be delivered in increments to areas with the highest forecasted demand, given that buses already operate on the corridor.	- Negative public attitudes due to impacts on local property in mature neighbourhoods. Multiple properties will be directly affected by widening of the right-of-way. - Public acceptability of a longer construction period for BRT and related disruptions to communities and businesses. - Access to supply chain and financing due to the higher upfront costs of electric buses and charging infrastructure. - Construction program resilience due to impact of inclement weather.

Option 2 – Aerial Cable Car Transit	• Conlin Transmission Towers: further investigation is required to confirm that the existing transmission corridor can be relocated underground where the ACCT line would intersect. • Constrained Corridor through Downtown: the corridor is constrained from Elgin Street to Olive Avenue, which will cause challenges to accommodating the ropeway and stations through this corridor without impacts to the street and parking available below. Special investigation is required through this segment to provide adequate horizontal and vertical clearance. CSA Z98:19 is the Canadian standard for passenger ropeways and passenger conveyors and can provide further design guidance. • Securing an OMSF Site: a facility is required, which needs to be connected to the ropeway and typically is integrated as part of a station. A facility has been assumed to be incorporated	• The Cable Car stations will be elevated at 9m above street level, which will require passengers to use stairs, escalators or elevators to access the system. • TRI-Line technology stations are quite compact – at approximately 17 m wide they would fit in the right-of-way of Simcoe Street in most locations along the corridor with minimal impact on traffic lanes and surrounding properties. • The TRI-line technology would require Cable Car towers to be spaced at 250m meters. The bases of the towers will utilise medians or a traffic turn lane, minimizing the impact to general traffic lanes. Some street segments within downtown Oshawa will have limited space to allocate ACCT towers and will require portal-shaped towers, narrower traffic lanes or other roadway design solutions to accommodate the towers.	• Limited previous application of cable car for commuter purposes in North America. • Limited number of manufacturers for TRI-Line technology may result in increased cost and/or impact of ability of the market to deliver. Currently, there is only one manufacturer providing this technology. However, it is anticipated that another manufacturer will develop an equivalent technology by the time this project advances to procurement. • Cable Car project delivery is design-led, whereas other transit projects are often construction-led. This distinction can present challenges for contractors to adapt to. • It may be deemed unfeasible to relocate the transmission corridor underground.
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Option	Feasibility	Delivery	Risks
	within the Winchester/407 station. Discussions with MTO are required to determine if this is viable, and other stations should be explored to determine if there is adequate space.		• Lack of adequate space in suitable location for OMSF site. • Privacy concerns for residents and businesses which aerial cable cars pass above and by. Technologies exist to lock cable car windows or turn windows opaque at certain angles and or places. • Public acceptability of lane closures during construction.

7.3 Operations & Maintenance Considerations

This section captures high-level considerations for the operations and maintenance of the Options as well as customers, including the relative pros and cons of the operating model for each of the Options. These are summarised in **Table 7.4**.

Table 7.4: Operational & Maintenance Considerations Summary

Option	Operational & Maintenance Impact	Risks
Option 1 – BRT	- Dedicated bus lanes will enhance travel times and their reliability along the corridor. The average operational speed will increase from as low as 15 km/h in the BAU to 26-27 km/h, with smaller variation depending on time of day or direction. - Providing BRT dedicated lanes and stations would require reallocating existing general traffic lanes to buses between Commencement Drive and Wellington Street – around 9 km in length. This will cause delays for auto traffic using the Simcoe Street corridor and will result in the redistribution of some volume to other corridors such as Ritson Road, Harmony Road, and Stevenson Road, among others. - Operating a fully electrified service will require an operator that understands the capability, capacity and operational considerations of electric buses and a charging access strategy. - As with the BAU, existing and planned DRT operations and maintenance facilities lack the capacity to support the additional buses required for expanded service in the future. A new or expanded facility will be	- The BRT route will include intersections with general traffic presenting conflict points where traffic may slow down or interfere with BRT operations. - Simcoe/Centre Couplet Transition: the transition in/out of the couplet requires buses to shift from centre-median to curbside operations (and vice-versa). Further work is needed to make this a seamless, safe and timely transition. - Connecting to the Ritson Road GO Station will require multiple turns from Simcoe Street which will reduce system speed in this segment. - Lane removals to enable BRT right of way will affect traffic conditions and accessibility of the corridor in a private vehicle. - Ensuring a seamless transfer and payment experience at interchanges between BRT and non-BRT transit services for customers.

Option	Operational & Maintenance Impact	Risks
	needed to accommodate the extra vehicles. A BRT system can allow for detours in routing if portions of the route are compromised or under maintenance.	
Option 2 – ACCT	- Aerial Cable Car in the preferred configuration will be able to operate large 20-passenger cabins with the headway of 24 seconds during the peak and 1 minute during the off-peak. As with BRT, this will increase transit capacity along the corridor by 350% compared to the BAU scenario. The Cable Car Feasibility Study (2024) states that it would be possible to increase the capacity on the system even further by adding more cabins. - The Cable Car system will require a dedicated operations and maintenance facility.	- Limited experience in urban cable car maintenance in Canada which presents different operational and maintenance considerations compared to ski hill systems. This includes the higher utilization of urban systems and no off-season period for major maintenance. - System maintenance schedule is not confirmed – typically, between 5 and 20 days of downtime per year. When the system is under maintenance, a replacement service will have to be identified and operated in the corridor. - Placement of the towers in the median might require additional vehicular collision-prevention measures along Simcoe Street. - There are some limitations to operations of construction cranes in proximity to the Cable Car, which might add some steps of approval for developers.

7.4 Commercial Considerations

7.4.1 Procurement Model

A range of procurement models have been used for transit services and infrastructure in Ontario. Models vary based on the level of risk and responsibility assigned to the Owner, other public sector entities, and private sector firms or consortiums. Typically, the procurement model defines the specific roles and commercial relationships for the owner

and private sector with respect to the design, construction, and operations and maintenance of the transit project.

For illustrative purposes, two different procurement models used in Ontario are shown in **Table 7.5**. These two models show a scale from low levels to higher levels of private sector involvement in the project across the lifecycle.

Table 7.5: Potential procurement models

Key attributes	Design-Bid-Build (DBB)	Design-Build-Operate & Maintain (DBOM)
Key parties	Owner contracts with separate entities for design and construction.	Owner contracts with a single entity or consortium who design, construct, and operate and maintain the service.
Key responsibilities	- Owner responsible for designer's plans and specification during construction. - Assumes liability for any defects. - Owner is also responsible for project operations, maintenance, rehabilitation and financing.	- Private sector organization or consortium accepts responsibility for design, construction, regular maintenance and operations under single contract. - Consortium bears cost overruns of asset construction and maintenance. - Owner sets and enforces performance standards across each element of the contract.
Contractual attributes	Two separate and sequential contracts: - Between owner and design firm to prepare detailed design and assist with construction contract tender. - General contractor build and design.	- Contract for maintenance and operations with a fixed timeline and hand over conditions. - Consortium bears the cost overruns of asset construction and maintenance. - The consortium may also pass on construction risk by entering into fixed-term and DB construction contracts with other contractors.
Payment	Contractor can be paid through multiple arrangements: Through progress or milestone payments, with an amount of payment	Construction contract paid in installments over the construction and maintenance period

Key attributes	Design-Bid-Build (DBB)	Design-Build-Operate & Maintain (DBOM)
	held until final project completion. • Payment upon substantial completion.	

The exact procurement model chosen for this project will be established at the next stage in business case development process. This process of reviewing models applied on other transit infrastructure projects in the GGH should seek to gain lessons learned and benefits of the various approaches already employed in the region. It should also look for risks of each model. A main risk area are interface risks. These occur at the handoff points between delineated areas of project scope from one governance actor to another, such as between design and construction or construction and operations. These interfaces must be managed to ensure that all project risks are accounted for and not unknowingly transferred from one actor to another.

7.5 Deliverability and Operations Case Summary

How do options perform at a deliverability and operational level?

Both project options have unique deliverability and operational/maintenance considerations and risks that will need to be explored in further detail. The Deliverability and Operations Case notes the following conclusions in **Table 7.6**.

Table 7.6: Deliverability and Operations Case Summary

Category	Option 1 – BRT	Option 2 – ACCT
Governance	Project governance structure could be similar for both Options but must have defined roles, responsibilities and decision-making authority. Determining this will require engagement with public entities to understand their willingness and capacity to support.	Project governance structure could be similar for both Options but must have defined roles, responsibilities and decision-making authority. Determining this will require engagement with public entities to understand their willingness and capacity to support.
Deliverability	- BRT will affect neighbourhoods along the Simcoe Street corridor with a longer construction period and some properties being impacted by the expanded right-of-way. - Risk mitigations include identifying the full extent and location of deliverability impacts in the corridor as well as coordination with interested and impacted parties.	ACCT presents risks as a novice technology in urban transit in Canada.
Operational and Maintenance	BRT design must account for reliability impacts at intersections with general traffic, including the Simcoe/Centre couplet transition and turns to Ritson Street GO Station. Transit signal priority should be considered to improve reliability.	ACCT option design should explore pathways to determine alternative transit solutions during periods of system maintenance and potential to improve operating speeds of the technology.
Procurement	The Project Owner must define the project and determine the level of design, build, operations and maintenance functions to be the responsibility of the	The Project Owner must define the project and determine the level of design, build, operations and maintenance functions to be the responsibility of the

Category	Option 1 – BRT	Option 2 – ACCT
	Project Owner versus other parties. • Models with more project interfaces present more areas for risk if not managed proactively.	Project Owner versus other parties. • Models with more project interfaces present more areas for risk if not managed proactively.

8 Business Case Summary

8.1 Business Case Findings

This Initial Business Case evaluates the potential for rapid transit investment along the Simcoe Street corridor. The corridor is a key north-south arterial in Oshawa and Durham Region and one of the key public transit corridors in the entire Greater Golden Horseshoe (GGH). The corridor will be under significant pressures in the future as transportation network demand growth will exceed available capacity. The existing local bus services on Simcoe Street have very limited room for their capacity growth being constrained by narrow street right-of-way, conflicts with general traffic, and lack of dedicated bus lanes. This will result in negative impacts to travellers, neighbourhoods, and businesses along the corridor.

To address these issues, Bus Rapid Transit (BRT) and Aerial Cable Car Transit (ACCT) solutions were evaluated in this IBC. ACCT has greater potential to address the key issues facing the corridor, to enable efficient and connected mobility, prosperity and liveability and housing and development while putting the corridor on the map as a region-wide leader in mobility solutions.

ACCT and BRT Option performance was compared across a four-case evaluation structure, with results summarized in **Table 8.1**.

Table 8-1: Business case summary

	Option 1 – BRT	Option 2 – ACCT	Conclusions
Strategic Case (2051 metrics presented)			
Increased Annual Transit Ridership	4,590,000 new annual transit trips on the service	5,370,000 new annual transit trips on the service	ACCT attracts more transit riders
Improved Reliability and Reduced Travel Times	4.0-minute average transit trip time savings	4.0-minute average transit trip time savings	Options deliver the same travel time savings per average trip
Efficient Mobility	\$6.9 million increase in annual operating costs Annual incremental revenues of \$14.2 million	\$6.7 million annual operating cost savings Annual incremental revenues of \$18.8 million	ACCT is less expensive to operate, results in operating cost savings and has higher revenue generation potential
Job Creation	10,000 full-time job years created	13,000 full-time job years created	ACCT can create more jobs in the economy
Rapid transit access to population and employment	Population: 55,000-68,000 new residents within 800- and 5,000-metre catchment area of a rapid transit station Jobs: 17,000-28,000 new jobs within 800- and 5,000-metre of a rapid transit station	Population: 45,000-65,000 new residents within 800- and 5,000-metre catchment area of a rapid transit station Jobs: 14,000-27,000 new jobs within 800- and 5,000-metre of a rapid transit station	Options provide similar rapid transit connectivity to residents and jobs within 800 and 5,000 metres
A healthier and more sustainable Durham Region	Reductions in annual car trips resulting in:	Reductions in annual car trips resulting in:	ACCT results in fewer auto collisions and resulting injuries and removes higher

	Option 1 – BRT	Option 2 – ACCT	Conclusions
	• 2 fewer auto collisions resulting in injury or fatality • -15,700 tonnes of GHG emissions • Fewer air pollutants, such as fine particulate matter (PM): -18 kg	• 11 fewer auto collisions resulting in injury or fatality • -81,400 tonnes of GHG emissions • Fewer air pollutants, such as fine particulate matter (PM): -94 kg	amounts of GHG emissions and air pollutants
Access to housing development opportunities	470-480 total acres of land suitable for housing development within 500m from a rapid transit station	470-480 total acres of land suitable for housing development within 500m from a rapid transit station	Comparable performance
Economic Case (discounted real 2024\$)			
Total Costs	\$780M	\$780M	No difference between options on costs
Total Benefits	\$270M	\$660M	ACCT realizes higher total societal benefits
Benefit Cost Ratio	0.35	0.84	ACCT produces over double the benefit per dollar spent versus BRT
Net Present Value	-\$510M	-\$120M	ACCT has a NPV \$390 million greater in value than BRT

	Option 1 – BRT	Option 2 – ACCT	Conclusions
Financial Case (discounted nominal \$)			
Capital Costs	\$530M	\$770M	BRT has lower capital costs than AACT
Operating Costs	\$80M	-\$90M	ACCT generates net operating cost savings for transit
Total Revenues	\$170M	\$200M	ACCT has a higher revenue generation potential
Operating Cost Recovery Ratio	0.51	1.02	ACCT revenues exceed operating costs
Total Financial Impact (2024\$)	-\$470M	-\$540M	BRT has a reduced financial impact compared to ACCT
Deliverability & Operations Case			
Deliverability	BRT is more space-intensive, will take away general traffic lanes and affect more properties along the corridor. Well-tested technology used on other corridors in the Region.	Compact system that can mostly fit into the existing right of way. Limited application of this technology in North American urban settings. Dependence on a few available technology providers.	BRT is more difficult to deliver due to larger impacts to the local road network and properties, while ACCT poses risks as a less-tested technology

	Option 1 – BRT	Option 2 – ACCT	Conclusions
Operations and Maintenance	Higher average speeds but less reliable operations due to conflicts with local traffic at intersections. The system allows for detours when required.	ACCT has shorter headways. A fully separated right-of-way will provide strong reliability, however, the technology will provide slower average operating speeds. System maintenance may result in temporary closures several times a year.	ACCT is more reliable and can provide shorter headways but has slower operating speeds than BRT. However, it requires regular system maintenance periods.
Commercial	A variety of procurement models exist with varying degrees of ownership, operations and maintenance responsibility	A variety of procurement models exist with varying degrees of ownership, operations and maintenance responsibility	Identify a suitable model at a later stage in the Business Case lifecycle

8.2 Key Insights for Decision Making

A rapid transit investment has the potential to make the Simcoe Street corridor, City of Oshawa and Region of Durham innovators and leaders in transportation solutions across the GGH. Based on the performance across these four cases the following conclusions are drawn from this IBC analysis:

- **Strategic Case:**
 - ACCT can provide higher levels of benefits across most benefit categories, such as: higher ridership and operating cost surplus, more jobs during project delivery and higher numbers of cars removed off local roads.
 - While BRT will be more reliable than the BAU, its design will still necessitate interactions with general traffic, leading to less attractiveness for users and lower ridership than ACCT.
 - With the potential increase in average operating speed for ACCT from 20 to 25 km/h, the ridership on the system could improve by 15%, further supporting the strategic benefits.
- **Economic Case:**
 - ACCT has a BCR of 0.84 compared to BRT with 0.35. This indicates ACCT has stronger economic performance with opportunities to further optimize the transportation network and bring more benefits to society.
- **Financial Case:**
 - ACCT requires higher initial investment with the total cost of \$740M compared to \$640M for BRT.
 - ACCT costs less to maintain and its revenue can fully cover operational costs (1.02 Operating Cost Recovery Ratio), while BRT revenues only cover half these costs (0.51 Operating Cost Recovery Ratio) and will require a subsidy.
- **Deliverability & Operations Case:**
 - ACCT provides high service frequencies but poses higher deliverability and operational risks as a novice technology in urban transit in Canada.
 - ACCT will require a supplemental transit service during periods when the system is closed for maintenance.
 - BRT takes more time to deliver, requires the removal of general traffic lanes and will impact more properties along the corridor.
 - BRT operations will interact with general traffic, making the service susceptible to externally caused delays.
 - Delivery of both options could be facilitated through multiple governance and procurement options.

8.3 Direction Sought

Based on these findings, the following considerations are noted for further development of the Simcoe Street Corridor rapid transit project:

- Conduct further evaluation of ACCT and BRT deliverability risks and mitigations.
- Consider actions and strategies to advance ACCT as a ‘new technology’ for urban transit in Canada.
- Review technology options available for the preferred option, including the potential to increase speed for ACCT or transit signal priority for BRT.
- Define the governance structure of the project to confirm roles, responsibilities and decision-making authority. Once confirmed, procurement options can be considered.
- Begin the development of Transit Project Assessment Process.

