URBAN MOBILITY TASK FORCE FINAL REPORT

FEBRUARY 2021

COUNCIL OF MINISTERS RESPONSIBLE FOR TRANSPORTATION AND HIGHWAY SAFETY

Table of Contents

Executive Summary

Executive Summary

Home to more than half of the world's population, urban regions are the engines of economic growth and employment. **According to the UN, 55 per cent of the world's population currently lives in cities. By 2050, that number is expected to reach 68 per cent. More than 80 per cent of Canadians live in urban centres and their surrounding suburbs.** With an increasing concentration of people and economic activities in urban regions, demand for moving goods and people is soaring. With increased urban mobility, **it has become common for parts of transportation networks to be used above design capacity, often leading to a loss of economic output** due to congestion in and around urban areas and overcrowding of certain modes.

Transportation has substantial impacts on the economy and the environment as well as the liveability of our urban centres and the health of Canadians. As such, **governments at all levels in Canada are working to address urban mobility issues** through various means, such as infrastructure investments, new and adaptive regulations, assessment and deployment of new technologies, transportation demand management initiatives, and further integration of transportation modes.

The Council of Ministers Responsible for Transportation and Highway Safety (COMT) recognizes the vital role that urban mobility plays in the everyday lives of Canadians. As such, in January 2019, COMT launched the Urban Mobility Task Force to examine current mobility issues affecting the Canadian urban landscape. The Task Force's objectives are to carry out a review of selected urban mobility issues and consider policy areas to improve urban mobility.

The **first phase** of the Task Force's work explored the current state, challenges and opportunities of urban mobility, with a focus on issues of technology and innovation, financing and funding, governance, and land use. The main takeaways from the interim report are that governments are:

- Assessing the disruptive effects and potential benefits of advanced technologies and evaluating if and how they can be leveraged in addressing urban transportation issues.
- Finding new ways to work across policy and geographical barriers through integration and interoperability of transportation systems.
- Strengthening existing funding and financing models and exploring new ones to address growing needs to ensure financial sustainability.
- Increasingly coordinating transportation and land use planning to increase performance, maximize future investments, and address issues related to sprawl.

Executive Summary

Recent efforts of the Task Force have emphasized the many exciting opportunities, and challenges, presented by today's environment. New technologies, financing models and land use planning concepts can help address the many challenges within the transportation sector.

Further, **the COVID-19 pandemic has highlighted the crucial nature of public transportation services** within urban regions, as many people, such as essential workers, depend upon this system. **The good news for Canadians is that while today's environment is challenging, it also presents exciting opportunities to innovate.** Efficient, effective transportation systems that utilize innovative technologies with sustainable financing can help achieve positive economic, environmental, and quality-of-life outcomes.

Fortunately, significant work is already underway in urban centres and within governments across Canada to address these issues. For example:

- Transportation and land use planning concepts such as complete communities and transportation demand management (TDM) can promote active modes of transportation and the use of public transportation services.

- Innovative financing models such as Public-Private Partnerships (P3s) can create flexible funding options, have the potential to alleviate risk and deliver projects faster, and can save tax-payer dollars.

- Effective and efficient governance models and cooperation among all levels of government can contribute to working across geographical and policy barriers.

- Technological change brought about by investments in digital innovation-from connected, automated vehicles to electrified powertrains, to zero emission vehicles--can drive efficiencies and improve service and traveller experience. It also fosters emerging transit options such as on-demand, more user-centric services and new options such as shared mobility and microtransit, thereby creating a more dynamic transit network.

Executive Summary

Phase two of this work produced a collection of snapshots, including the examples mentioned above as well as other policy areas being considered across Canada. These snapshots will help raise awareness of the various innovative ideas being implemented and considered across Canada. In addition to policy considerations, the snapshots include possible key performance indicators, examples of implementation across urban centres and a look at potential COVID-19-related impacts. It is the Task Force's hope that these assessments are reviewed and discussed among urban mobility policy experts and transportation planners from different jurisdictions and governments across Canada.

The policy areas the Task Force explored included:

- Complete Communities
- Microtransit
- Public-Private Partnerships (P3 Models)
- Regional Fare Integration
- First/Last Mile
- Fare Zone/Time of Use Pricing
- Streamlined Approval Processes
- State of Good Repair/Reliability (transit infrastructure)
- Signalling Upgrades/Lighter Vehicles (transit)
- Transportation Demand Management
- New Mobility Models/Service Integration
- Freight Delivery and Intermodal Hubs
- Data and Information Management
- Congestion Management.

Although its mandate is complete, Task Force members will continue to facilitate intergovernmental contacts and dialogue as urban mobility challenges continue to be addressed across Canada.

Final Report

Mandate and Purpose

Launched in January 2019, the Urban Mobility Task Force sought to take a renewed look at current mobility issues affecting the Canadian urban landscape today. The Task Force's activities have included a review of selected urban mobility issues and a consideration of policy areas to improve urban mobility.

The objective of this work has been to explore options to improve quality of life, bolster economic competitiveness and reduce the carbon footprint of Canadian cities by improving the movement of goods and people in and around urban areas.

This initiative has been a partnership between federal, provincial and territorial governments to ensure that these challenges and opportunities are explored on the national level.

The intended audience for this work is transportation policy professionals, planners, and decision-makers.

This final report can contribute to more complex discussions on how urban mobility can work for Canada as a whole. Specifically, it can be used to demonstrate the importance of urban centres to Canada's economy and competitiveness and to raise greater awareness about pressing urban mobility issues and trends.

A Team Approach

At its January 2019 meeting, COMT tasked the Urban Mobility Task Force with a two-year mandate that included:

- An interim report on the state, challenges and opportunities of urban mobility.
- A final report exploring options and tools for improving urban mobility in Canada's urban regions.

In accordance with its mandate, the Task Force carried out a comprehensive review of the main issues impacting urban mobility, sought to identify their causes and explored potential solutions.

Task Force participants have included representation from Transport Canada, Infrastructure Canada and provincial jurisdictions, including Ontario, British Columbia, Alberta, Saskatchewan, and Québec.

This report assesses mitigating solutions to issues raised in phase 1 and identifies policy areas and best practices in addressing urban mobility issues.

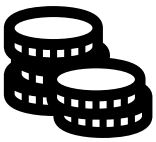
Final Report

Summary of Key Findings – Phase 1

The interim report, which was approved by COMT in February 2020, included an introduction and four primers: Innovation and Technology, Funding and Financing, Governance, and Land Use Planning. These primers were selected in response to key urban transportation issues that had previously been discussed, including needs and opportunities, transit development, the cost of congestion, and corridor management.

1. Innovation and Technology

The rapid pace of technological advancements poses challenges to governments and calls on their capacity to articulate timely transportation objectives and establish regulations that are flexible and long-lasting. It also presents an opportunity to create more efficient and reliable transit systems.



2. Financing and Funding

Large-scale infrastructure, growing transportation needs, and fiscal constraints challenge governments to find sustainable and innovative ways to fund and finance transportation infrastructure and operations.

3. Governance

Effective and efficient governance can contribute to working across geographical and policy barriers through integration and interoperability of systems.

4. Land Use Planning

Governments can integrate transportation and land use planning to achieve wider policy goals, optimize investments and improve the efficiency of transportation networks.

Phase 2

Through the second phase of its work, the Task Force has focused on developing policy areas that could serve to address challenges identified in phase 1.

Vision for Urban Mobility

Throughout Canada, initiatives and approaches may vary, but all governments at all levels are working toward similar goals in their efforts to improve safe and sustainable urban mobility; support job creation and economic prosperity; reduce pollution and minimize impacts on the environment; alleviate gridlock; and enhance liveability for communities through access to workplaces, leisure activities and promotion of social equity.

The Task Force assessed policy areas that could help achieve these goals and contribute toward a common vision for sustainable urban mobility in Canada – **Canadian cities with reliable, efficient and safe transportation networks that are accessible, enable vibrant economies, achieve positive environmental outcomes and support dynamic communities.**

Policy Areas Identified

To deliver on its mandate, the Task Force explored several policy areas to address urban mobility issues by describing their level of alignment with a number of objectives, namely: environmental sustainability; economic competitiveness; system performance; safety and health; and liveability. These objectives were selected through Task Force discussions and consensus and align with current transportation priorities. Given the recent COVID-19 pandemic, each assessment also included a section on COVID-19 considerations (e.g., whether social distancing practices could be incorporated, job creation for recovery). *See Appendix A for an overview of policy areas assessed.*

The policy areas the Task Force explored included:

- **Complete Communities**
- **Microtransit**
- **Public-Private Partnerships (P3 Models)**
- **Regional Fare Integration**
- **First/Last Mile**
- **Fare Zone/Time of Use Pricing**
- **Streamlined Approval Processes**
- **State of Good Repair/Reliability (transit infrastructure)**
- **Signalling Upgrades/Lighter Vehicles (transit)**
- **Transportation Demand Management**
- **New Mobility Models/Service Integration**
- **Freight Delivery and Intermodal Hubs**
- **Data and Information Management**
- **Congestion Management.**

Summary of Findings

The Canadian urban mobility landscape is complex, with shared national and unique regional issues. **Governments at all levels and across jurisdictions must work together to tackle the various challenges faced by urban centres.** A number of innovative options are available to address these challenges, including those assessed within this report. Although each potential solution comes with its own set of challenges, addressing urban mobility issues within Canada in a cooperative and concerted fashion could lead to a boost in productivity and economic performance, contribute to a cleaner environment, and increase social inclusion and health outcomes for Canadians.

The COVID-19 pandemic has not only created numerous immediate challenges for Canada but has also highlighted the importance of urban mobility. **Economic recovery efforts are an opportunity for Canada to innovate and strive towards a more efficient and effective transportation network that encompasses and advances urban mobility objectives and initiatives.**

The policy areas presented in this report provide meaningful opportunities for further exploration by each respective jurisdiction, based on its unique needs and priorities.

The following appendices provide an overview of the policy areas assessed, as well as the snapshot for each option.

Appendix A

Appendix A

The following section provides an overview of policy areas identified by the Task Force.

Overview of Topical Policy Areas

Through its work, the Task Force reviewed the policy areas below. The policy areas listed within this section are considered particularly topical. Details on each, including further analysis, appear in Appendix B.

The Task Force has gathered some examples from Canadian cities for a select number of particularly topical policy areas, namely **Complete Communities, Microtransit and Public-Private Partnerships (P3s)**, as well as an overview of approach in several jurisdictions.

Complete Communities

Complete Communities are places such as mixed-use neighbourhoods or other areas within cities, towns, and settlement areas that make it possible for residents to fulfil the majority of their day-to-day needs within the community itself.

Complete Communities offer many benefits, including:

- The ability of residents to be work, learn or go to school, shop, and access health care in the community they live in.
- A range of housing types for all ages and income levels and access to a range of community and social services to assist those in need in the community.
- A population level and density that supports the provision of public transit.
- A neighbourhood design that encourages interconnected and accessible mobility systems with a priority on pedestrian and bicycle transportation options.
- A street network that allows easy travel across the community and into other communities.
- A design that considers the current and future needs of the community.
- Less dependency on cars, allowing reduced GHG emissions and helping to create a more carbon-neutral community.
- The protection of valuable farmland and natural areas because development is concentrated in a smaller area, rather than scattered across the landscape.

Challenges to implementation include addressing environmental protection requirements, land use approval and permitting problems, labour considerations, and identifying appropriate funding models to manage the reduction in gas tax revenue as users rely more on active transportation.

Appendix A

Jurisdictional Examples

In terms of the approach in Canadian jurisdictions, key highlights include:

British Columbia (BC):

- BC allows local governments to undertake their own community planning; official community plans describe the long-term vision of communities. They are a statement of objectives and policies that guide decisions on municipal and regional district planning and land use management. These decisions impact communities' sustainability and resilience.
- BC has created a comprehensive community planning (CCP) handbook that breaks down CCP into manageable stages.[1]
    - o The handbook includes practical tools to encourage community involvement and develop the plan based on the community's vision and goals.
    - o Since the handbook was first published in 2006, many First Nations in BC have begun their own CCP journey. The First Nations of BC are becoming increasingly involved in CCP as a way of embracing change and planning a better future for their communities.
- The CCP is aimed at:
    - o Empowering the local community
    - o Improving land use planning decision-making and expertise within the local government
    - o Coordinating future development
    - o Protecting local resources
    - o Celebrating local traditions and culture
    - o Promoting healing and reconciliation with Indigenous groups and
    - o Creating local economic opportunities.

Ontario:

- Ontario's long term plan for the Greater Golden Horseshoe (GGH), *A Place to Grow: Growth Plan for the Greater Golden Horseshoe*, is designed to promote economic growth, increase housing supply, create jobs and build communities that make life easier, healthier and more affordable for people of all ages.
- As part of the vision and guiding principles for the GGH, this plan will support the achievement of complete communities, with access to transit networks, protected employment zones and an increase in the amount and variety of housing available.
- Ontario is also developing a long-term transportation plan for the Greater Golden Horseshoe. This plan will ensure that the future transportation system supports continued prosperity and quality of life until 2051.
- This plan will help inform how decisions are made about policy and infrastructure investments and provide direction to municipalities, transportation agencies and service providers. It will also help to ensure that the transportation system supports continued prosperity and quality of life and meets the environmental, economic and social needs of families, businesses and communities.
- This plan will align with, and build upon other provincial initiatives, including *A Place to Grow: Growth Plan for the Greater Golden Horseshoe.*

Appendix A

Jurisdictional Examples

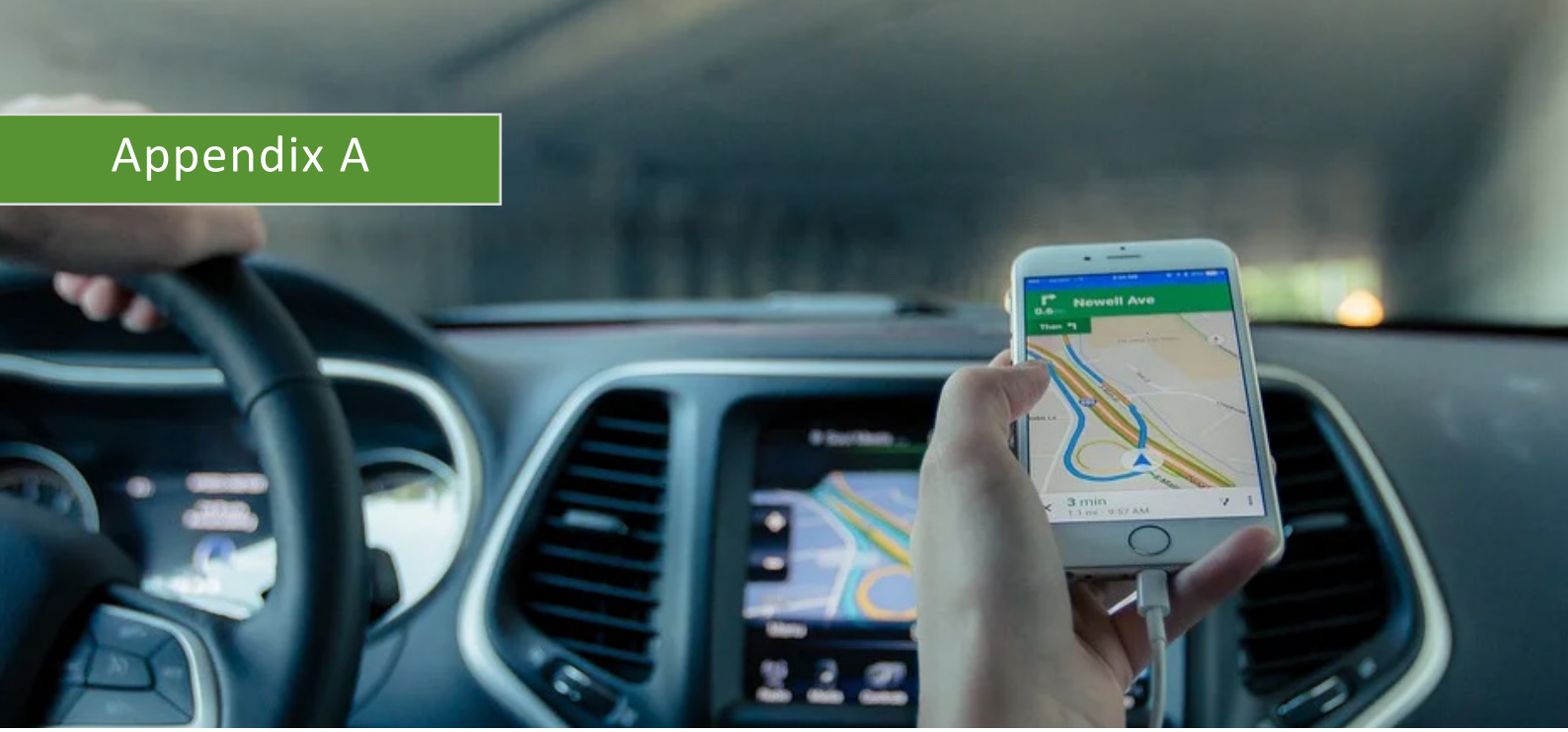
Prince Edward Island (PEI):

- Under the local Planning Act, thirty-two municipalities accepted responsibility for planning and created official plans and land-use bylaws, thereby covering 10 per cent of PEI's land-mass. The Planning Act guides the development of these documents.[2]
- A municipality develops its plan by consulting with the residents, who help ensure that future development will meet the community's needs while making sure that present uses are protected. The plan deals with issues such as:
    - o Protecting resource land and natural areas
    - o Locating new housing, industry, and commercial offices
    - o Identifying essential services such as roads, sewers, and parks.

PEI is in the process of creating a provincial land use policy that will:

- Set the direction for how land is used and how development takes place on PEI
- Help protect what is cared about and
- Be strategic about public investments.

Appendix A



Microtransit

Microtransit refers to small-scale, flexible transportation services whereby rides are ordered on demand through a mobile app or website, or in some cases by phone. It offers flexible routing and/or flexible scheduling of minibus vehicles. It creates routes that meet demand (trip) and supply (driven vehicle).

Microtransit offers many benefits, including:

- Increasing service coverage in areas that fixed-route buses do not serve.
- Providing flexible service for commuters whose schedules do not fit into fixed-route service timing.
- Creating equitable and economical service by facilitating paratransit and carpooling.
- Reducing travel time by picking up and dropping off riders at common locations and stops.
- Relieving congestion on busy routes during peak hours and providing efficient, demand-responsive, late-night service during off-peak hours.
- Offering an easy, quick and convenient online booking and payment system.
- Building ridership for more robust transit.
- Reducing the total of vehicle miles travelled and the amount of GHGs emitted by reducing the use of personal vehicles.
- Being cost-effective by using cheaper, smaller vehicles on low-performing routes or during off-peak hours instead of large transit buses.

Challenges to implementation include addressing labour considerations and identifying the most appropriate type of microtransit for a community given the number of existing options. Those who can benefit most from microtransit services, including seniors, or individuals with physical or cognitive disabilities, may face challenges using app-based services if they can't access a cell phone.

Appendix A

Jurisdictional Examples

In terms of the approach in Canadian jurisdictions, key highlights include:

Alberta:

- Calgary launched an on-demand service starting October 13, 2020. Users book travel as needed and can be picked up and dropped off at any of the existing stops in the community and other major locations. This service is aimed at providing full services to lower demand communities, with the same hours of service as usual routes, but with shuttles instead of standard buses.[3]
- Edmonton Transit Service, in conjunction with Pacific Western Transportation and Via Transportation, will be launching an on-demand transit service in mid-2021 as part of a two-year pilot project.[4] A total of 57 shuttle buses will conveniently and safely connect residents in select neighbourhoods with a nearby transit hub. These accessible shuttles do not follow fixed routes and only operate upon request. This service is meant to provide transit service when needed on lower demand routes, but without using standard buses.
- Medicine Hat Transit (MHT) has launched a microtransit pilot project in partnership with Spare, which will run until the end of 2021. The on-demand service circulates in Medicine Hat's northeast and northwest, replacing the area's underperforming weekday evening fixed-route bus services. It also connects to the central bus terminal, allowing residents to take better advantage of the fixed-route lines in the MHT network.[5]

Ontario:

- The Toronto Transit Commission (TTC) is launching an automated vehicle Shuttle Pilot (Rouge Hill GO) in spring 2021, in partnership with Metrolinx, the City of Toronto, and the federal government. The route will run on a fixed route/schedule. This pilot falls under the province's AV Pilot Program, which was the first such program established in Canada in 2016 and is aimed at providing transit service in lower demand areas.
- Niagara Region Transit, in partnership with Via Mobility, launched a microtransit on-demand flex-route starting in August 2020 for areas with lower demand.
- GO Transit and UP Express launched a ride-hailing partnership with Metrolinx, Lyft (GO Transit stations), and Uber (UP Express stations), which will conclude in 2020. The project is marketing partnerships for ride-hailing services offering first-mile/last-mile connections from stations in order to reduce personal vehicle use in congested areas.
- Through Phase 2 of the Safe Restart Agreement, the government of Ontario is asking municipalities to explore microtransit as a way of supporting the long-term sustainability of the transit system and meeting transit demand in targeted areas.

Saskatchewan:

- Saskatoon Transit launched an on-demand transit system on July 20, 2020 aimed at providing service on lower demand routes. Riders request a trip using an app, website, or over the phone, and a bus will pick up passengers at the stop of their choice and drop them off while serving other riders.[6]

Yukon:

- Whitehorse had a Transit Master Plan prepared for the city in 2018, which recommended that the city begin to invest in microtransit.
- Enabling microtransit solutions in lower-density areas of the city would increase productivity and lower the cost of providing traditional transit service in those areas. The consultant also recommended that Whitehorse Transit invest in on-demand/dynamic scheduling software.[7]

Appendix A

Public-Private Partnerships (P3s)

Public-private partnerships (P3s) are partnerships between governments and the private sector to build public infrastructure like roads, hospitals or schools, or to deliver services.

P3s offer many benefits, including:

- Establishing a comprehensive team from start to finish, allowing engineers and contractors to collaborate from the outset.
- Creating flexible funding options for projects that would otherwise not have funding. Projects can be completed using long-term payments that don't require an increase in taxes.
- Completing projects more quickly than traditional methods because the design and construction phases can be overlapped-projects can be started while design is still ongoing.
- Allowing government funds to be saved for use in other areas of need in the community.
- Transferring the risk (e.g., operating, maintenance, design, construction and rehabilitation costs, financing rates, and timing) from taxpayers to the private sector.
- Reducing government budgets, budget deficits and potentially taxes.

Challenges Challenges to implementation can include, depending on the P3 model chosen, ownership considerations, the sometimes-costly nature of private financing, as well as risk allocation between the private and public sector. While P3 models offer benefits, they are not always the right financing tool for every project.

Appendix A

Jurisdictional Examples

In terms of the approach in Canadian jurisdictions, key highlights include:

New Brunswick (NB):

- NB finished upgrading the Trans-Canada Highway (NB portion) in 2007 through a P3. The project included the design and construction of 98 kilometres of four-lane highway between Grand Falls, NB and Woodstock, NB, as well as the selected upgrade of 128 kilometres of existing four-lane highway. The Project Agreement also included the operation, maintenance and rehabilitation of the entire 275-kilometre stretch of highway until 2033.[8]
    - o Using a P3 resulted in cost savings of approximately 15 per cent compared with traditional procurement.[9]

Newfoundland and Labrador:

- Newfoundland and Labrador are seeking a private partner to assist with building St. Johns Mental Health and Addictions Facility. The successful private partner would be responsible for all aspects of design, construction, facility maintenance and lifecycle rehabilitation, as well as some soft services such as utilities management, security services, information system and helpdesk.[10]

Nunavut:

- Nunavut is currently underway with its Iqaluit International Airport Improvement Project. The private partner, Air Infrastructure Partners (AIP), will operate and maintain the existing airport during construction of the new airport and will operate and maintain the new airport for 30 years after construction is finished. The Government of Nunavut will own the airport during the entire period. The Project Agreement has significant requirements for the involvement of the Nunavut Land Claims Agreement (NLCA) Beneficiaries, requiring AIP to provide a diverse range of training opportunities to local Inuit community members.[11]

Appendix A

Other Policy Areas Considered

The Task Force also considered a range of other policy areas that included:

Fare Initiatives: Regional Fare Integration/ Fare Zone/Time-of-Use Pricing: Regional fare integration requires that all modes of public transit merge their fares into a single payment system, with discounts sometimes offered for interjurisdictional connections. This allows for easier transition for commuters between one transit provider and another. Fare zone pricing varies depending on how many zones the transit commuter travels through during the day. Time-of-use pricing requires higher transit fare prices under congested conditions and lower prices at less congested times and locations. The goal is to reduce peak-period travel volumes to optimal levels.

Challenges to implementation include addressing labour considerations, finding a fare model agreeable to all transit providers, and addressing the issue of commuters who do not have travel time choices.

First Mile-Last Mile refers to the first and last portions of a traveller's trip and their method of travel to and from a transit stop or station (e.g., personal vehicle, bicycle, on foot, etc.). The term **Last Mile** is also used in goods movement and refers to the delivery of goods from some type of consolidation centre (e.g., a warehouse, distribution centre, or micro-hub) to their final destination (e.g., a retailer's store or customer's home). From a personal travel perspective, first-mile/last-mile initiatives are aimed at reducing personal vehicle use and GHG emissions by encouraging biking, walking, electric vehicle use, carpooling, or microtransit public vehicle use. In many cases, it is unknown how new technologies will affect urban mobility behaviours. For example, automated and connected vehicles are changing the transportation landscape, but it is not fully clear what their impact will be on congestion, safety and land development. As they become more prevalent, they could be used in first mile-last mile deliveries.

Challenges to implementation of traveller-related first-mile/last-mile initiatives include finding appropriate funding models, overcoming the public's preference for personal vehicles, and ensuring the reliability and convenience of sustainable transportation methods.

Streamlined Approval Processes are the result of actions taken to implement more efficient, simple and agile approaches in approval systems through the introduction of technology. They are aimed at replacing paper workflows, reducing the number of regulations and approvals, reducing the time and cost of approvals, eliminating duplicate regulations, improving customer service and clarifying regulatory definitions.

Challenges to implementation include the high cost of technology and staff training and addressing environmental concerns while reducing approval timelines.

Appendix A

State of Good Repair/Reliability involves having well-maintained, reliable transit infrastructure, such as tracks, signal systems, bridges, tunnels, vehicles and stations. It is aimed at ensuring safe, dependable and accessible services.

Challenges to implementation include finding an appropriate definition of "state of good repair", obtaining adequate funding for maintenance and repair projects, and balancing labour considerations with environmental considerations.

Signalling Upgrades for rail-based transit involve upgrading radio signals, fibre-optic lines, and computer software. This allows each train to know precisely where it is relative to trains around it, thus enabling them to run more closely together. Upgrades can also be applied to services by Light-Rail Vehicles, which are made from lighter material, such as nitrogen-strengthened stainless steel instead of heavier conventional steel. Both are aimed at improving vehicle safety, lowering cost, reducing noise and enhancing ride dynamics.

Challenges to implementation include addressing labour considerations and the high cost of signal equipment.

Transportation Demand Management (TDM) consists of a wide variety of specialized policies, targeted programs, innovative mobility services, and products to incentivize changing travel behaviours to reduce travel. TDM strategies include, but are not limited to, Nonmotorized Transportation Improvements, Street Reclaiming, Traffic Calming, School Trip Management, Addressing Security Concerns, Car-Free Planning, Vehicle Restrictions, off-peak fares, peak period pricing, peak period traffic restrictions, carpooling programs, road pricing, parking management, etc. It is aimed at managing congestion and reducing GHG emissions by optimizing the use of the transportation network by reducing demand in peak congested periods.

Challenges to implementation are based on what individual TDM strategy is chosen. However, challenges common to most TDM strategies include addressing construction and maintenance costs, finding appropriate land space, addressing environmental impacts, integrating land use and transportation planning and decision-making processes, integrating fare and service processes, and hesitancy from users in changing their behaviours.

New Mobility Models are user-centric public and private transportation services, mostly available on demand, made possible by mobile technology and real-time location data. They can include ride-hailing, rideshare, car share, bike share, and microtransit. They are aimed at creating user-centric transportation objectives and complementing existing public transit operations.

Challenges to implementation include improving coordination between land use entities (municipalities and developers) and transportation providers (public and private), implementing appropriate urban design, finding appropriate space for mobility projects, and addressing public concerns with rapid pace of change.

Appendix A

Freight Delivery and Intermodal Hubs are the systems, networks, digital tools and disruptive innovations concerned with the movement of commodities, merchandise and cargo, and inclusive of: long haul and short haul movements; warehousing facilities and distribution centres; urban transportation of goods and last-mile delivery; and port logistics. They support the movement of freight from origin to destination by a sequence of at least two transportation modes that are integrated to better achieve efficiency across the supply chain. Both are aimed at improving the efficiency of freight delivery.

Challenges to implementation include managing the number of delivery vehicles on roads, dealing with a highly fragmented freight sector, addressing the cost of replacing existing legacy infrastructure, and handling service performance issues caused by competition between the modes.

Intelligent Transportation Systems are the many digital technologies used in a wide variety of ways to improve the efficiency and use of transportation infrastructure.

Challenges to implementation include increasing internal expertise or capacity to pursue ITS projects and obtaining capital and operating funding.

Road Space Re-Allocation is the re-allocation of limited road space to provide priority or dedicated infrastructure for transit, active transportation, and shared-use vehicles. It is aimed at managing congestion, improving commuter travel times and GHG emissions.

Challenges include the difficulties in the gathering and analysis of corridor capacity and usage data and in obtaining capital funding, the development of regulatory frameworks to ensure new forms of micromobility are safe in relation to sharing the road with pedestrians, cyclists, and motor vehicles, governance in relation to developing the future of micromobility across the country, and the potentially significant changes required in transportation corridor design and standards.

Data and Information Management is processes, tools, and practices used to acquire, maintain, store, secure, and share data/information. Data sets relevant to urban mobility include: traffic speeds/travel times; traffic volumes (passenger and commercial vehicles); bicycle and pedestrian volumes; accident/incident occurrences; infrastructure investment information; population, business and demographic data; freight and goods movement data (such as parcel deliveries); parking at transit; complete trip planning; predictive analysis of volumes. It is aimed at improving the efficiency of road networks and connecting transportation users to data.

Challenges to implementation include addressing privacy concerns with public and private information.

Congestion Management is the processes, tools, and practices such as optimizing road signals; lane adjustment (e.g., HOV lanes, bus lanes); dynamic lane adjustment (temporarily modifying lanes use); speed control; infrastructure improvements; public transit improvements; road tolls; congestion pricing; intelligent transportation systems; and new mobility models, among others. All of these are aimed at mitigating the effects of traffic congestion (when traffic demand exceeds roadway capacity).

Challenges to implementation include addressing maintenance and communication system costs, public concerns with road tolls and the affordability of new mobility models for some commuters.

Appendix B

Appendix B

The following section provides the snapshots of policy areas assessed.

Urban Mobility Initiatives*

Complete Communities

Category: Land-Use Planning

Definition: Places such as mixed-use neighbourhoods or other areas within cities, towns, and settlement areas that offer and support opportunities for people of all ages and abilities to conveniently access most of the necessities for daily living, including an appropriate mix of jobs, local stores, and services, a full range of housing, transportation options and public service facilities. Complete communities are age-friendly and may take different shapes and forms appropriate to their contexts.

Challenges: Challenges to implementation include addressing environmental protection requirements, land use approval and permitting problems, labour considerations, and identifying appropriate funding models to manage the reduction in gas tax revenue as users rely more on active transportation.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) can be easily integrated into planning models.
2. **Economic Recovery:** Creates jobs, provides more housing options, creates opportunities for businesses.
3. **Health and Safety:** Enables easier access to services and amenities.

Examples of KPIs:

Possible areas to measure include: Residential intensification; Urban Growth Centre Density (population and employment density); Major Transit Station Area (the number of people and jobs per hectare within major transit station areas); Designated Greenfield Density Area; Range and Mix of Housing Types; Diversity of Land Uses; Community Amenities (i.e., percentage of dwelling units within walking distance of community amenities); Street connectivity; Transportation Modal Split; Trip Distance by Mode; Location of Major Office Space.

**This document is a tool to share information and best practices amongst jurisdictions and does not contain an exhaustive analysis. Jurisdictions will need to conduct their own internal analysis before implementing the various policy areas presented.*

Continues on the next page

Appendix B

Complete Communities Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • The implementation of complete communities has the potential to reduce GHG emissions in a municipality (i.e., improving transit, creating a more compact urban form, increasing density). Compact urban form and complete communities enable people to drive less, which can reduce congestion, and decrease per capita vehicle GHG emissions. <u>Protects Waterways/ Natural Areas:</u> • Complete communities use land more efficiently and reduce development pressures on important natural areas outside of settlement areas. Natural areas not only protect	<u>Job Creation:</u> • This approach requires municipalities to plan for all types of economic activity – industrial, office, retail and other services to support economic development. <u>Facilitate Goods Movement:</u> • This approach should contain policies that direct some forms of employment to locations that support land use and transportation objectives. Providing opportunities to use a variety of transportation modes to access employment will help reduce traffic congestion and free up the road system for goods movement and other economic activity.	<u>Congestion Relief:</u> • Complete communities enable people to drive less, which can reduce congestion and free up the road system for goods movement and other economic activity. <u>Capacity/Efficiency:</u> • Complete communities should be planned and managed to offer a balance of transportation choices that reduces reliance upon any single mode by promoting transit, cycling and walking.	<u>Passenger and Vehicle Safety:</u> • Reduces congestion and offers a balance of transportation choices. Separate cycling and pedestrian lanes can be integrated in planning to encourage safe and active transportation modes. <u>Accessibility:</u> • Complete communities promote active modes of transportation as well as an active lifestyle with parks and recreational centres nearby. • This approach also ensures a mix of amenities in a compact urban form. This will ensure essential services are easily accessible.	<u>Access to Services and Amenities:</u> • A richness and diversity of land uses is an important component of a complete community that enables people to live, work, shop, play and access services in close proximity. • Complete communities should be transit supportive and pedestrian-friendly and provide a mix of amenities to which residents can easily walk or cycle. As connectivity increases, travel distances decrease and route options increase, creating a more accessible network.

Continues on the next page

Appendix B

Complete Communities Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	our natural heritage but help to mitigate climate change removing and storing carbon. They also help to filter and store water, improving water quality and reducing the impact of rain storm events.	<u>Cost:</u> • This approach should be cost effective and align with other regional plans for transit investment. Attaining appropriate levels of funding is necessary when developing complete community plans.			<u>Access to Employment Opportunities:</u> • Complete communities can meet residents' needs for daily living throughout a lifetime. This includes providing convenient access to an appropriate mix of jobs, local services and a full range of housing, transit and community amenities. <u>Social Equity:</u> • Resources and opportunities are distributed appropriately through the availability of mixed housing, education, transportation and employment options.

Fare Initiatives: Regional Fare Integration/ Fare Zone/Time of Use Pricing

Category: Traffic Management

Definition: Regional fare integration requires that all modes of public transit merge their fares into a single payment system, with discounts sometimes offered for interjurisdictional connections. This allows for easier transition for commuters between one transit providers and another. Fare zone pricing varies depending on how many zones the transit commuter travels through during the day. Time-of-use pricing requires higher transit fare prices under congested conditions and lower prices at less congested times and locations. The goal is to reduce peak-period travel volumes to optimal levels.

Challenges: Challenges to implementation include addressing labour considerations, finding a fare model agreeable to all transit providers, and addressing the issue of commuters who do not have travel time choices.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated into fare initiatives.
2. **Economic Recovery:** Should create jobs and opportunities for businesses.
3. **Health and Safety:** Fare initiatives would take into consideration health and safety considerations.

Examples of KPIs:

Possible areas to measure include: Reduction in commuter travel time GHGs emitted.

Examples of Implementation:

- Metrolinx and GTHA public transit providers fare initiatives (ON)
- Transit Fare Review (TransLink)
- Compass Shared Mobility Pilot Project (TransLink)

Continues on the next page

Appendix B

Fare Initiatives Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Fare initiatives encourage commuters to drive less thus reducing the amount of GHGs emitted.	<u>Job Creation:</u> • Fare initiatives allow the region to become more economically competitive, such as through less traffic congestion. <u>Facilitate Goods Movement:</u> • Fare initiatives encouage commuters to drive less thus reducing the amount of time goods are held up through congestion. <u>Cost:</u> • Fare initiatives would reflect the quality and value of the service.	<u>Congestion Relief:</u> • Fare initiatives encourage commuters to drive less thus reducing congestion occurrences. <u>Capacity/Efficiency:</u> • Fare initiatives encourage commuters to drive less thus reducing congestion occurrences and improve the efficiency of the highway network in the region, while supporting smart growth.	<u>Passenger and Vehicle Safety:</u> • Fare initiatives would involve all transit safety measures consistent with government requirements. <u>Accessibility:</u> • Fare initiatives would involve all transit accessibility measures consistent with government requirements.	<u>Access to Services and Amenities:</u> • Fare initiatives would allow commuters easier travel to services and amenities. <u>Access to Employment Opportunities:</u> • Fare initiatives would allow commuters easier travel to services and amenities. <u>Social Equity:</u> • Fare initiatives would allow commuters easier and possibly cheaper travel for disadvantaged groups.

First/Last Mile

Category: Land-Use Planning

Definition: The First/Last Mile of commuter transit is the term given to the method of travel to and from a place of residence and a place of transit service. For example, many commuters drive a personal motorized vehicle from their place of residence to the local public transit train station. Transit service providers and others aim to reduce the amount of GHG-emitting personal vehicle use and replace them with other more sustainable transportation methods such as bike, walk, electric vehicle, carpooling or microtransit public vehicle. The Last Mile of goods movement refers to the delivery of goods from some type of consolidation centre (e.g. a warehouse, distribution centre, or micro-hub) to its final destination (e.g. a retailer's store or customer's home). Similar sustainable transportation methods as commuter transit can be used for goods movement/delivery.

Challenges: Challenges to implementation include finding appropriate funding models, overcoming the public's preference for personal vehicles, and ensuring the reliability and convenience of sustainable transportation methods.

COVID-19

1. **Mobility**: COVID-19 friendly practices (i.e., social distancing, PPE, etc.) can be easily integrated into First/Last Mile transportation methods.
2. **Economic Recovery:** Creates jobs, provides more housing options, creates opportunities for businesses.
3. **Health and Safety:** Enables easier access to services and amenities.

Examples of KPIs:

Possible areas to measure include: Number of commuters who use First/Last Mile transportation methods, number of trips Last Mile transportation trips used by businesses, amount of reduced GHGs, reduction in delivery costs, reduction in transit service provider costs and travel time reduction.

Continues on the next page

Appendix B

First/Last Mile Continued

Examples of Implementation:

- Metrolinx First/Last Mile transportation plan (ON)
- Bike Parkades (TransLink)
- Walk to Transit Cost-Sharing Program (TransLink)

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Lowers GHG emissions when electric vehicles or bikes or walking infrastructure are used. <u>Protects Waterways/ Natural Areas:</u> • Less GHG emissions will protect the health of sensitive environmental areas.	<u>Job Creation:</u> • May increase job opportunities for business and individuals associated with providing First/Last Mile transit services. <u>Facilitate Goods Movement:</u> • More efficient movement of traffic allows more efficient movement of goods. <u>Cost:</u> • Less traffic congestion can reduce costs associated with late delivery of goods. • First/Last Mile transportation methods and infrastructure may be costly or unprofitable.	<u>Congestion Relief:</u> • Less personal and goods movement vehicles on roads reduces traffic congestion. <u>Capacity/Efficiency:</u> • Fewer vehicles on roads allows more efficient movement of people and goods.	<u>Passenger and Vehicle Safety:</u> • Fewer vehicles reduces congestion and offers a balance of transportation choices. Separate cycling and pedestrian lanes can be integrated in planning to encourage safe and active transportation modes. <u>Accessibility:</u> • Can meet the needs of commuters with special needs.	<u>Access to Services and Amenities:</u> • Can provide significantly increased access to commuters who had limited options to access government and other services and amenities. <u>Access to Employment Opportunities:</u> • Increases employee retention and satisfaction by allowing the movement of businesses to within walking distance of customers and staff. <u>Social Equity:</u> • Allows commuters to choose the most appropriate and cost-effective method on traveling to work.

Appendix B

Intelligent Transportation Systems

Category: Innovation & Technology

Definition: The application of digital technology to transportation systems, with the goal of optimizing performance and efficiency.

Challenges: Challenges to implementation include increasing internal expertise or capacity to pursue ITS projects and obtaining capital and operating funding.

COVID-19

1. **Mobility:** Helps people and goods move more efficiently.
2. **Economic Recovery:** Enables more efficient use of existing infrastructure.
3. **Health and Safety:** Enables easier access to services and amenities.

Examples of Implementation:

- Railway Crossing Information System (BC MoTI)
- Advanced Traveller Information System/Dynamic Messaging Signs (BC MoTI)
- Variable Speed Limit Corridors (BC MoTI)
- Real-Time Next Train Signs (TransLink)
- Compass Card/Open Payment System (TransLink)
- Park&Go App (TransLink)
- Traffic Management Centre (City of Surrey)

Continues on the next page

Appendix B

Intelligent Transportation Systems Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	Reduces GHGs/Air Pollution: • ITS can better manage congestion and delays, reducing GHGs.	Job Creation: • ITS supports direct jobs in technology and engineering and economy-wide employment through greater transportation efficiency. Facilitate Goods Movement: • ITS supports goods movement by better managing road congestion, road/rail interactions, and the management of containers at ports. Cost: • Relative to infrastructure expansion, ITS is a cost-effective solution to improving the efficiency of existing transportation options.	Congestion Relief: • ITS can better manage congestion and delays by notifying customers and suggesting alternative routes, speeds, or modes. Capacity/Efficiency: • ITS increases the overall capacity and efficiency of the transportation systems by providing customers with better information, enabling better decision making. It also provides system managers with the ability to respond to congestion or delays in real-time.	Passenger and Vehicle Safety: • ITS can better manage congestion and safety by alerting customers of delays or emergencies and suggesting alternative routes or modes.	Access to Services and Amenities: • ITS can improve management of the transportation system as a whole and enable improved customer decision making, improving the efficiency of transport and enabling improved access to services and amenities. Access to Employment Opportunities: • ITS can improve management of the transportation system as a whole and enable improved customer decision making, improving the efficiency of transport and enabling improved access to employment opportunities. Social Equity: • ITS, when applied broadly to all modes and in applications that do not require a smartphone, computer, or internet, can improve access to transportation information for all, enabling better customer decision making.

Microtransit

Category: Land-Use Planning

Definition: Microtransit (MT) refers to small scale, flexible transportation services whereby rides are ordered on-demand, through a mobile app or website, or in some cases, by phone. Multiple passengers can share trips with others who have similar routes or destinations. Goals for microtransit can include reduced congestion and GHG emissions, reduced municipal transit costs, increased access, equity and better commuter satisfaction.

Challenges: Challenges to implementation include addressing labour considerations and identifying most appropriate type of microtransit given the number of existing options.

COVID-19

1. Mobility: COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easy to integrate into microtransit programs.
2. Economic Recovery: Creates jobs and opportunities for new businesses.
3. Health and Safety: Enables easier and safe access to services and amenities.

Examples of KPIs:

Possible areas to measure include: Number of GHGs reduced, level of commuter satisfaction and amount of reduced costs for municipal transit providers.

Examples of Implementation:

- Innisfil Transit partnership with Uber (ON)
- Brantford's eRide (ON)
- Wellington County's RideWell (ON)

Continues on the next page

Appendix B

Microtransit Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Depending on the micro-transit program chosen, significant GHGs emissions can be reduced in the targeted locality.	<u>Job Creation:</u> • Depending on the micro-transit program chosen, it can allow new transit businesses to be created in local areas. <u>Facilitate Goods Movement:</u> • Microtransit can allow more efficient delivery of goods through less vehicles travelling on local roads and highways. <u>Cost:</u> • Municipal transit providers should be able to reduce costs by allowing small on-demand transit services to replace costly under-performing bus routes. Costs reduced can include labour, bus purchase and maintenance costs.	<u>Congestion Relief:</u> • Microtransit can reduce the number of transit or single occupant vehicles on roads and highways. <u>Capacity/Efficiency:</u> • Depending on the micro-transit program chosen, it can save municipal transit providers money to be used to focus on making other transit routes more efficient.	<u>Passenger and Vehicle Safety:</u> • Fewer vehicles reduces congestion and offers a balance of transportation choices. Separate cycling and pedestrian lanes can be integrated in planning to encourage safe and active transportation modes. <u>Accessibility:</u> • Depending on the microtransit program chosen, it can meet the needs of commuters with special needs.	<u>Access to Services and Amenities:</u> • Depending on the microtransit program chosen, it can provide significantly increased access to commuters who had limited options to access government and other services and amenities. <u>Access to Employment Opportunities:</u> • Depending on the microtransit program chosen, it can provide significantly increased access to commuters who had limited options to access employment opportunities. <u>Social Equity:</u> • Depending on the microtransit program chosen, it can provide significantly increased access to disadvantaged commuters who had limited options to access government and other services and amenities.

Appendix B

Public-Private Partnerships

Category: Land-Use Planning

Definition: Public-private partnerships, or P3s, are partnerships between governments and the private sector to build public infrastructure like roads, hospitals or schools, or to deliver services. Unlike traditional procurement, the public sector integrates all parts of a P3 project into one contract. Depending on the preferred P3 model, this approach requires the architect, the builder, the lender and the maintenance and/or operations provider to form a team. The main models are:

- Operation & Maintenance Contract: A private operator, under contract, operates a publicly owned asset (e.g. water/wastewater treatment plant) for a specified term. Ownership of the asset remains with the public entity.
- Build-Finance: The private sector constructs an asset and finances the capital cost only during the construction period.
- Design-Build-Finance-Maintain: The private sector designs, builds and finances an asset and provides hard facility management (hard fm) or maintenance services under a long-term agreement. (Hard facility management is the management of services that cannot be removed from the premises and are directly related to the fabric of the building, such as lighting, plumbing and heating services. These items are required to ensure the health and safety of employees. Soft Facilities Management are landscaping, window cleaning and security services, etc.)
- Design-Build-Finance-Maintain-Operate: The private sector designs, builds, finances and provides hard fm or maintenance services under a long-term agreement. Operation of the asset is also included in projects such as bridges, roads and water treatment plants.
- Concession: A private sector concessionaire undertakes investments and operates the facility for a fixed period of time after which the ownership reverts back to the public sector. The public sector sponsor often pays the private sector concessionaire an availability payment to make the asset available to the public.

Challenges: Challenges to implementation can include, depending on the P3 model chosen, ownership considerations, the sometimes-costly nature of private financing, as well as risk allocation between the private and public sector. While P3 models offer benefits, they are not always the right financing tool for every project.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated into P3 models.
2. **Economic Recovery:** Creates jobs and opportunities for businesses.
3. **Health and Safety:** P3 models would take into consideration health and safety considerations.

Continues on the next page

Public-Private Partnerships Continued

Examples of KPIs:

Possible areas to measure include: Reduction in project completion time and costs, number of local jobs created, and amount of reduced GHGs.

Examples of Implementation:

- Gordie Howe International Bridge Project (ON)
- Canada Line Rapid Transit Project (BC)

Continues on the next page

Appendix B

Public-Private Partnerships Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	Reduces GHGs/Air Pollution: • Government can use P3s to access financing for projects that might otherwise not be available. • Government can often deliver P3 projects faster than through a traditional procurement. • This means that government is able to realize the environmental benefits of public transportation projects earlier.	Job Creation: • P3s can be created to require involvement from local construction contractors. Facilitate Goods Movement: • P3s generally result in a quicker completion time than traditionally completed projects resulting in less traffic congestion and delays, which can facilitate the efficient movement of goods. Cost: • P3s can result in lower costs to complete the project relative to traditionally completed projects. • The costs associated with risks is transferred from the public sector to the private sector.	Congestion Relief: • P3s generally result in a quicker completion time than traditionally completed projects resulting in less traffic congestion and delays. Capacity/Efficiency: • P3s generally result in a quicker completion time than traditionally completed projects resulting in less traffic congestion and delays.	Passenger and Vehicle Safety: • Depending on the project, P3s would meet government passenger and vehicle safety requirements. Accessibility: • Depending on the project, P3s would meet government accessibility requirements.	Access to Employment Opportunities: • P3s generally involve local contractor involvement, thus creating job opportunities for community members.

Appendix B

Road Space Re-Allocation

Category: Innovation & Technology/Land-Use Planning

Definition: Re-allocation of limited road space to provide priority or dedicated infrastructure for transit, active transportation, and shared use vehicles.

Challenges: Challenges include the difficulty in the gathering and analysis of corridor capacity and usage data, the difficulty in obtaining capital funding, and transportation corridor design and standards changes may be significant.

COVID-19

1. **Mobility:** Improves multi-modal capacity and reliability.
2. **Economic Recovery:** Enables more efficient use of existing road infrastructure.
3. **Health and Safety:** Improves multi-modal safety, particularly for active transportation.

Examples of Implementation:

- Victoria Bus Lanes (City of Victoria, BC MoTI, BC Transit)
- Hwy 97 HOV Lanes (BC MoTI)
- TransLink RapidBus Program (TransLink)
- Vancouver Separated Bike Lanes (City of Vancouver)
- Victoria Bike Lane Network (City of Victoria)
- Streets for People (City of New Westminster)
- Nanaimo Separated Bike Lane (City of Nanaimo)
- British Columbia Active Transportation Design Guide (BC)

Continues on the next page

Appendix B

Road Space Re-Allocation Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Improves the speed, reliability and safety of transit and active transportation, which supports a mode shift and reduction in emissions per capita. <u>Protects Waterways/ Natural Areas:</u> • Improves the speed, reliability and safety of transit and active transportation, which supports a mode shift and a reduction in road runoff and particulate matter polluting natural areas.	<u>Job Creation:</u> • Supports economy-wide employment by increasing the mobility of individuals and the efficiency of the overall transportation system. <u>Facilitate Goods Movement:</u> • Supports goods movement by enabling a greater mode shift to transit and active transportation, which provides greater roadway capacity for trucking. <u>Cost:</u> • Can be implemented through low cost space reallocation or through higher cost capital infrastructure rebuild or expansion.	<u>Congestion Relief:</u> • Supports congestion reduction by enabling a greater mode shift to transit, active transportation, or shared use vehicles, which increase the overall people moving capacity of a corridor <u>Capacity/Efficiency:</u> • Increases the overall people moving capacity of a corridor, thereby increasing its overall efficiency.	<u>Passenger and Vehicle Safety:</u> • Dedicated lanes yield improved safety for all road users by reducing or eliminating conflict areas. <u>Accessibility:</u> • Road space re-allocation can increase accessibility for multi-modal transportation, by providing more space for pedestrians, cyclists and transit users.	<u>Access to Services and Amenities:</u> • Road space re-allocation can increase the people moving capacity of a corridor, thereby increasing the ease of access to services and amenities. <u>Access to Employment Opportunities:</u> • Road space re-allocation can increase the people moving capacity of a corridor, thereby increasing the ease of access to employment opportunities. <u>Social Equity:</u> • As certain groups are more likely to rely on non-auto transport, re-allocating roads to give transit and active transportation dedicated space can yield benefits for the most vulnerable.

Traffic Signals

Category: Traffic Management

Definition: Signaling Upgrades allows public transit services to be more efficient and reliable, thus encouraging commuters to abandon personal vehicles and use public transit. Signalling upgrades would involve radio signals, fiber optic lines, and advanced computer software which allows each train to know precisely where it is relative to the train in front of it so they can run more closely together. This real-time information about each train's locations can be shared with customers so they can make more informed decisions about their travel choices. It also allows driverless transit vehicles to be used.

Lighter Vehicles involves the creation of bus or train vehicles using lighter material, for example, nitrogen-strengthened stainless steel is lighter than conventional steel. Advantages include improved vehicle safety for passengers, lower cost, reduced noise and improved ride dynamics.

Challenges: Challenges to implementation include addressing labour considerations and the high cost of signal equipment.

COVID-19

1. Mobility: COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated into signaling upgrades and lighter vehicles.
2. Economic Recovery: May create jobs and opportunities for businesses.
3. Health and Safety: Signaling upgrades and lighter vehicles would take into consideration health and safety considerations.

Examples of KPIs:

Possible areas to measure include: Reduction in commuting and incident delay times, and reduction in operating costs.

Examples of Implementation:

- Toronto Transit Commission signal upgrades (ON)

Continues on the next page

Appendix B

Signaling Upgrades/Lighter Vehicles Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Driverless subway vehicles are more energy efficient than human-operated trains.	<u>Facilitate Goods Movement:</u> • Signal upgrades results in more reliable public transit thus encouraging commuters to abandon the use of personal vehicles, which can facilitate the efficient movement of goods. <u>Cost:</u> • Signal upgrades reduces the amount of labour costs for transit providers because wages and benefits account for 40 percent of the cost of operating the subways. • Lighter vehicles reduce costs through smaller tires, lighter brakes, batteries, motors etc.	<u>Congestion Relief:</u> • Signal upgrades allows more reliable journeys with fewer delays, so more trains can run, and more people will be able to travel via public transit and not personal vehicles that cause congestion. <u>Capacity/Efficiency:</u> • Signal upgrades allows real-time information about each train's locations that can be shared with customers so they can make more informed decisions about their travel choices.	<u>Passenger and Vehicle Safety:</u> • Driverless subway vehicles are safer than human-operated trains. For example, Signal upgrades allow trains to run closer together and travel at their best speeds while maintaining safe braking distances. • Lighter vehicles improve passenger experience through less noise and better ride dynamics.	<u>Access to Employment Opportunities:</u> • Signal upgrades promotes faster journey times that allow businesses to relocate near less congestion areas, which boosts the local economy.

Appendix B

State of Good Repair/Reliability

Category: Traffic Management

Definition: State of Good Repair/Reliability (SGR) involves having well maintained, reliable transit infrastructure – track, signal systems, bridges, tunnels, vehicles and stations – will help ensure safe, dependable and accessible services.

Challenges: Challenges to implementation include finding an appropriate definition of "state of good repair", obtaining adequate funding of repair projects, and balancing labour considerations with environmental considerations.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated into any repair projects.
2. **Economic Recovery:** Should create jobs and opportunities for businesses.
3. **Health and Safety:** Repair projects would take into consideration health and safety considerations.

Examples of KPIs:

Possible areas to measure include: Reduction in commuting times, accidents and damage to property, amount of GHG emissions.

Examples of Implementation:

- Translink overview of SGR (BC)

Continues on the next page

Appendix B

State of Good Repair/Reliability Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Infrastructure in a good state of repair would encourage commuters to abandon the use of personal vehicles in favour of public transit, thus reducing GHG emissions.	<u>Job Creation:</u> • "Good state of repair" projects should create opportunities for businesses. <u>Facilitate Goods Movement:</u> • Infrastructure in a good state of repair would encourage commuters to abandon the use of personal vehicles in favour of public transit, thus reducing the number of vehicles on roads and highways. <u>Cost:</u> • Infrastructure in a good state of repair should reduce costs through less accidents and damage to property.	<u>Congestion Relief:</u> • Infrastructure in a good state of repair would encourage commuters to abandon the use of personal vehicles in favour of public transit, thus reducing the number of vehicles on roads and highways. <u>Capacity/Efficiency:</u> • Infrastructure in a good state of repair would allow a more reliable transit system.	<u>Passenger and Vehicle Safety:</u> • Infrastructure in a good state of repair would lead to increased passenger and vehicle safety. <u>Accessibility:</u> • Infrastructure in a good state of repair would meet government accessibility requirements.	<u>Access to Services and Amenities:</u> • Infrastructure in a good state of repair would ensure easier access to services and amenities, fewer delays and promote the use of public transportation. <u>Access to Employment Opportunities:</u> • Infrastructure in a good state of repair would ensure easier access to employment opportunities, ensure fewer delays and promote the use of public transportation.

Appendix B

Streamlined Approval Process

Category: Public Administration

Definition: A Streamlined Approval Process (SAP) is the result of actions taken to implement more efficient, simple and agile approaches in approval systems through the introduction of technology. It is aimed at replacing paper workflows, reducing the number of regulations and approvals, reducing the time and cost of approvals, eliminating duplicate regulations, improving customer service and clarifying regulatory definitions.

Challenges: Challenges to implementation include the high cost of computers and staff training and addressing environmental concerns while reducing approval timelines.

COVID-19

1. Mobility: COVID-19 friendly practices (i.e., social distancing, PPE, etc.) can be easily integrated into streamlined approval processes.
2. Economic Recovery: Streamlined Approvals would allow shovel-ready projects to get underway more rapidly, thus supporting economic recovery goals.
3. Health and Safety: Enables safe access to services and amenities.

Examples of KPIs:

Possible areas to measure include: Approvals timeline reduction, money saved, customer satisfaction, GHGs reduced.

Examples of Implementation:

- WaterCanada streamlined decision-making process (CA)

- Public Services and Procurement Canada pilot to modernize and streamline approvals for defence contracts (CA)

Continues on the next page

Appendix B

Streamlined Approval Process Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	Reduces GHGs/Air Pollution: • Depending on the SAP chosen, an SAP can reduce the carbon footprint of an organization through less paper and space needed through the adoption of technology, for example.	Job Creation: • Depending on the SAP chosen, an SAP can remove regulatory control including eliminating the need for approvals from government that allows businesses to reduce costs and hire more staff. Cost: • Depending on the SAP chosen, an SAP can create clarity, transparency and consistency in government services that help businesses and individuals make cost-based decisions. • Less paper used results in reduced paper and printing expenditures. Eliminating workflows based on paper, also reduces staff time cost. Cost of computer hardware and software may be significant.	Capacity/Efficiency: • Improves the efficiency of government services through reduced approval times, less duplication of effort and enhanced government consultation and communication with the general public and the business sector.	Passenger and Vehicle Safety: • Projects streamlined for approval should meet government passenger and vehicle safety requirements. Accessibility: • Projects streamlined for approval should meet government accessibility requirements.	Access to Services and Amenities: • Depending on the SAP chosen, an SAP can make government more accessible by using modern technology such as through one-window, one-stop 24/7 online services or an easier application process with clarified and simple instructions for government applications. Access to Employment Opportunities: • Depending on the SAP chosen, an SAP can allow more online access to job opportunities advertisements. Social Equity: • Depending on the SAP chosen, an SAP can improve access to government services for certain groups.

Continues on the next page

Appendix B

Streamlined Approval Process Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
		• Depending on the SAP chosen, an SAP can also improve budget fore-casting. When request workflows are electronic and easily trackable, it's possible to see what resources are in-demand and how budget funds can be spent most wisely.			

Traffic Demand Management

Category: Land-Use Planning

Definition: Consists of a wide variety of specialized policies, targeted programs, innovative mobility services, and products to incentivize changing travel behaviours to reduce travel. Traffic Demand Management strategies include, but are not limited to, Nonmotorized Transportation Improvements, Street Reclaiming, Traffic Calming, School Trip Management, Addressing Security Concerns, Car-Free Planning, Vehicle Restrictions, off-peak fares, peak period pricing, peak period traffic restrictions, carpooling programs, road pricing, etc. It is aimed at managing congestion and reducing GHG emissions by optimizing the use of the transportation network by reducing demand in peak congested periods.

Challenges: Challenges to implementation are based on what individual TDM strategy is chosen. However, challenges common to most TDM strategies include addressing construction and maintenance costs, finding appropriate land space, addressing environmental impacts, integrating land-use planning and decision-making processes, and integrating fare and service processes.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated into TDM strategies.
2. **Economic Recovery:** Improved traffic management can support more efficient movement of goods and people.
3. **Health and Safety:** Enables safe access to services and amenities.

Examples of KPIs:

Possible areas to measure include: Reductions in GHGs, travel times (commuter and goods movement) and number of accidents.

Examples of Implementation:

- Peel Region's Sustainable Transportation Strategy (ON)
- Kamloops: TravelSmart Program (BC)
- Vancouver TDM Program (BC)

Continues on the next page

Appendix B

Traffic Demand Management Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Depending on the TDM strategy chosen, TDM can reduce the use of fossil-fuel burning vehicles in favour of other types of transportation such as electric buses, bike and walking infrastructure. <u>Protects Waterways/ Natural Areas:</u> • Depending on the TDM strategy chosen, TDM can help create more Sustainable Transportation. TDM reflects sustainability principles of efficiency and integration, and can help achieve sustainability objectives including resource conservation, equity, environmental protection, efficient land use, and public involvement.	<u>Cost:</u> • When all impacts (benefits and costs) are considered, TDM strategies are often the most cost-effective way to improve transportation. TDM can defer and reduce the need to expand roads and parking facilities and provide other cost-reduction benefits such as reduced traffic accidents, energy conservation, and improved mobility for non-drivers. <u>Facilitate Goods Movement:</u> • Depending on the TDM strategy chosen, TDM can provide flexible responses to many types of transportation problems, including those that are urgent, temporary, variable or unpredictable. TDM programs can be implemented quickly, and	<u>Congestion Relief:</u> • Depending on the TDM strategy chosen, TDM can reduce traffic congestion and offer other transportation options. <u>Capacity/Efficiency:</u> • Depending on the TDM strategy chosen, TDM can provide more efficient land use such as encouraging clustered, infill, multi-modal development, as opposed to dispersed, urban periphery, automobile-dependent development.	<u>Passenger and Vehicle Safety:</u> • Depending on the TDM strategy chosen, TDM can reduce the risk of traffic crashes, and associated damages and injuries. <u>Accessibility:</u> • Depending on the TDM strategy chosen, TDM helps create more aesthetically attractive and pedestrian-friendly streetscapes, neighbourhood interaction, and preservation of unique cultural features.	<u>Access to Services and Amenities:</u> • Depending on the TDM strategy chosen, TDM can improve transportation options and provide financial rewards, and consumers benefit from reduced traffic congestion, parking problems, crash risk and pollution emissions. TDM also helps create more aesthetically attractive and pedestrian-friendly streetscapes, neighborhood interaction, and preservation of unique cultural features. <u>Social Equity:</u> • Depending on the TDM strategy chosen, TDM can result in a fairer allocation of resources between different demographic and geographic groups.

Continues on the next page

Appendix B

Traffic Demand Management Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
		tailored to a particular situation and user group. It also avoids the risk that a major capital investment will prove wasteful due to unforeseen changes in transportation needs. • Depending on the TDM strategy chosen, TDM can correct existing market distortions, which increases economic efficiency, equity and consumer benefits. TDM supports economic development by increasing productivity and reducing external costs.			Many strategies directly benefit people who are economically, physically or socially disadvantaged by improving transportation options available to non-drivers.

Data and Information Management

Category: Technology & Innovation/Governance

Definition: The processes, tools, and practices used to acquire, maintain, store, secure, and share data/information. Data sets relevant to urban mobility include: traffic speeds/travel times; traffic volumes (passenger and commercial vehicles); bicycle and pedestrian volumes; accident/ incident occurrences; infrastructure investment information; population, business and demographic data; freight and goods movement data (such as parcel deliveries); parking at transit; complete trip planning; predictive analysis of volumes. It is aimed at improving the efficiency of road networks and connecting transportation users to data.

Challenges: A challenge to implementation is addressing privacy concerns with public and private information.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) could be communicated via data and information management systems.
2. **Economic Recovery:** Improved information and data management can support more efficient movement of goods and people.
3. **Health and Safety:** Enables safe access to services and amenities.

Continues on the next page

Appendix B

Examples of KPIs:

Possible areas to measure include: Coverage and use of datasets; quantity of infrastructure proposals that use data effectively, transit time indexes on road segments, transit time reliability.

Examples of Implementation:

- Transport Canada purchases travel time data and shares with an FPT Working Group; Provinces and Territories contribute traffic volume data (CA)
- Ontario's Ministry of Transportation and Transport Canada have undertaken projects using ATRI truck data (ON & CA)
- The Ports of Vancouver, Prince Rupert and Montreal are using GPS data from trucks to monitor their movement from warehouses to marine and rail terminals (BC)
- The University of Toronto Smart Freight Centre (SFC) is a partnership between universities with public and private support and is home to the Intelligent Transportation System of Systems (ITSoS) and SFC Data Warehouse (ON)

Continues on the next page

Appendix B

Data and Information Management Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • Traffic volume and travel times are used to accurately measure excess GHG emissions <u>Protects Waterways/ Natural Areas:</u> • Traffic and environmental data strengthen fact based decision making through better measuring and monitoring of traffic impacts, informing environmental assessment process for new projects and potential policy changes.	<u>Job Creation:</u> • Businesses can enhance their operational efficiencies and supply chains by using data to move goods more effectively. This will result in increased competitiveness and the opportunity for companies to grow and hire more employees. <u>Facilitate Goods Movement:</u> • Traffic data can inform operational decision making and planning, providing better efficiency. • Logistics data improves customer service supporting notifications of shipment and parcel deliveries. <u>Cost:</u> • Data can inform optimization of road usage and help to manage capital investments.	<u>Congestion Relief:</u> • Granular traffic data can provide insights into traffic volumes and travel times and can be used to target specific infrastructure improvements to expand capacity and eliminate bottlenecks. <u>Capacity/Efficiency:</u> • Using data to inform forecasting will provide more comprehensive infrastructure planning by developing scenarios of traffic volumes and travel times. These forecasts can better focus the scope of infrastructure projects and develop more comprehensive business cases. • Real time data exchange and analysis of traffic data through Artificial Intelligence and machine learning assists with route selection for passengers and freight and leads to better optimization of the transportation network.	<u>Passenger and Vehicle Safety:</u> • Location specific data and analysis can be used to assess causes of accidents/incidents as well as develop predictive models that can anticipate future incidents. • Data can be used to monitor the movements of licenced overweight and oversized movements on roads and highways to ensure the impacts of these loads are minimized on traffic. <u>Accessibility:</u> • User based trip data can provide more insight into particular users and better understanding of trip origins and destinations as well as route selection. This will allow for better transportation options for users with diverse and desperate needs.	<u>Social Equity:</u> • Data will provide better insight into the users of the transportation network as well as providing fact based insight to ensure equitable access to the transportation network.

Innovation in Freight Delivery and Intermodal Hubs

Category: Technology & Innovation/Land-Use Planning

Definition: Systems, networks, digital tools and disruptive and sustaining innovations concerned with the movement of commodities, merchandise and cargo, and inclusive of: long haul and short haul movements; warehousing facilities and distribution centers; urban transportation of goods and last mile delivery; and port logistics. Intermodal hubs support the movement of freight from origin to destination by a sequence of at least two transportation modes that are integrated to better achieve efficiency across the supply chain.

Challenges: Challenges to implementation include more delivery vehicles on roads, dealing with a highly fragmented freight sector, addressing the cost of replacing existing legacy infrastructure, and handling service performance issues caused by competition between the modes.

COVID-19

1. **Mobility:** COVID-19 friendly practices (i.e., social distancing, PPE, etc.) should be easily integrated.
2. **Economic Recovery:** Innovation in freight delivery and intermodal hubs can support more efficient movement of goods and people.
3. **Health and Safety:** Enables safe access to services and amenities.

Continues on the next page

Appendix B

Examples of KPIs:

Possible areas to measure include: vehicle wait times and throughput at intermodal facilities; administrative costs; urban congestion caused by delivery vehicles; traffic growth.

Examples of Implementation:

- The City of Montréal and Transport Canada, the Port of Montréal is working on an intelligent transportation system for port trucking (QC & CA)
- In Québec, CanScan has developed an adaptable autonomous artificial intelligent system (QC)
- Transport Canada invests in multi-stakeholder partnership projects on data gathering and supply chain visibility (CA)
- Based in Montréal AI-Powered Supply Chains Supercluster SCALE.AI was named as one of five successful business-led innovation Superclusters to receive federal funding (QC & CA)

Continues on the next page

Appendix B

Innovation in Freight Delivery and Intermodal Hubs Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	<u>Reduces GHGs/Air Pollution:</u> • With continued growth in global trade and e-commerce fueling freight and parcel delivery volumes, there is a growing need for environmentally sustainable solutions to freight/logistics operations and last-mile delivery in cities. Sustainability considerations are impacting freight stakeholders' social license to operate. • These developments, coupled with an increasing shift towards renewable or 'green' energy sources, are propelling the development of electric mobility and zero-emissions solutions for logistics. Translating this	<u>Job Creation:</u> • Integration of new freight digital technologies such as cloud logistics and the internet of things could create new higher end IT jobs within the freight sector. • As new market entrants emerge and expand, new jobs could be created. An example is Amazon opening new warehouses in Canada, each creating a significant number of new jobs. <u>Facilitate Goods Movement:</u> • Innovations and technologies can facilitate goods flows by helping carriers better optimize the use of their assets, providing shippers with greater visibility of goods in transit and helping inform public policies and programs.	<u>Congestion Relief:</u> • Digital and intelligent solutions that better manage truck traffic can also provide relief from congestion. For example, artificial intelligence (AI) can allow ports to reliably predict truck volumes based on advanced reading of congestion levels and truck locations provided by Global Navigation Satellite Systems. • Technologies that support the better synchronization of hand-offs between modes can help smooth bunching around hubs and in doing so help reduce freight/passenger conflicts.	<u>Passenger and Vehicle Safety:</u> • Depending on the digital solution employed, some freight technologies can enhance the safety of goods delivery vehicles. For example, electronic logging devices (ELDs), which monitor activity in trucks, help to ensure the health and safety of drivers as well as others on the road.	<u>Access to Employment Opportunities:</u> • Depending on the solutions employed, the more efficient and affordable movement of goods may result in increased employment opportunities for small businesses, entrepreneurs, etc.

Continues on the next page

Appendix B

Innovation in Freight Delivery and Intermodal Hubs Continued

Pillars	Environmental Sustainability	Economic Competitiveness	Transportation System Performance	Safety and Health	Liveability
	awareness into logistics, renewable technologies can be leveraged for further 'electrification' and energy autonomy in the supply chain.	**Cost:** • Freight technologies find efficiencies that will reduce costs. To take Blockchain as an example, the World Economic Forum estimates that document processing accounts for 20% of the total transportation costs within global trade.	Capacity/Efficiency: • Automation in the modes has the potential to drastically effect capacity/efficiency, particularly at intermodal facilities. In Canada, terminals in Vancouver and Prince Rupert are operating at 80-90 percent of capacity, making the automation or semi-automation of some operations possible to enhance operations. • Many of the new business/service models in the freight sector are based on data analytics. Data sharing in this space is critical to optimizing available information.		

Endnotes

1 CCP Handbook - Comprehensive Community Planning for First Nations in British Columbia Third Edition § (2016). https://www.aadnc-aandc.gc.ca/eng/1377629855838/1377632394645.

2 Land Use Planning in Prince Edward Island § (2015). https://www.princeedwardisland.ca/en/ information/communities-land-and-environment/land-use-planning-prince-edward-island.

3 “Calgary Transit On Demand - West Calgary.” Calgary Transit. Calgary Transit, September 15, 2020. https://www.calgarytransit.com/news/calgary-transit-demand.

4 https://ridewithvia.com/news/canadas-largest-on-demand-transit-service-set-to-launch-in-edmonton/

5 Vik Hansen, Kristoffer. “Medicine Hat Pilots New on-Demand Microtransit Service Backed by Canadian Company Spare’s Powerful Technology.” Web log. Spare (blog). Spare, September 29, 2020. https://sparelabs.com/en/blog/medicine-hat-transit-launches-microtransit/.

6 “On-Demand Transit - Effective July 20, 2020.” Saskatoon Transit. Saskatoon Transit. Accessed December 10, 2020. https://transit.saskatoon.ca/plan-my-trip/demand-transit-effective-july-20-2020.

7 Stantec Consulting Ltd. Transit Advisory Services, City of Whitehorse Transit Master Plan § (2018). https://www.whitehorse.ca/home/showdocument?id=10014.

8 “Trans-Canada Highway (New Brunswick).” p3spectrum. The Canadian Council for Public-Private Partnerships. Accessed December 10, 2020. http://www.p3spectrum.ca/project/info/?id=51.

9 “Trans-Canada Highway (New Brunswick).” p3spectrum. The Canadian Council for Public-Private Partnerships. Accessed December 10, 2020. http://www.p3spectrum.ca/project/info/?id=51.

10 “St. Johns Mental Health and Addictions Facility.” p3spectrum. The Canadian Council for Public-Private Partnerships. Accessed December 10, 2020. http://www.p3spectrum.ca/project/info/?id=722.

11 “Iqaluit International Airport Improvement Project.” p3spectrum. The Canadian Council for Public-Private Partnerships. Accessed December 10, 2020. http://www.p3spectrum.ca/project/info/?id=249.

Acknowledgements

February 2021

The Urban Mobility Task Force would like to thank its members for their contribution and dedication to this work. The Task Force was comprised of the following members:

British Columbia: David Greer; Paul Hillsdon

Saskatchewan: Andrew Liu

Alberta: Ryan Reichl; Matt Buffett

Ontario: Derek Deazeley; Shaunna Hubert; Dylan Kekanovich; Byron Perry

Québec: Jean-Marc Lefebvre

Transport Canada: Erin Hooper; Neil Kochhar; Annie-Josée Caron; Gabe Rother; Jeffrey Salvail; Lilianne Lebrun; Matthew Lesniak; Idzva Tsatsa Kotwas; Iain Tyrrell; Adrian Halucha; Tyler Doose

Infrastructure Canada: Kristy Darragh; Antoine Doucet