



CANADIAN URBAN
TRANSIT ASSOCIATION

INTEGRATED MOBILITY

Implementation Toolbox

September 2017



Letter from the Chair



The transition from being a transit provider to an integrated mobility provider is a major shift for the Canadian transit industry. This is especially true as each transit system must first educate and promote the importance of this shift, and then make it happen.

As a member of CUTA's Board of Directors since 2010, I have always been a strong advocate of the shift towards integrated mobility and mobility management. Therefore, as Vice-Chair of CUTA's Integrated Mobility Task Force and Chair of the Mobility Management Implementation Task Force, I am very proud to present you with this toolbox.

This document aims to provide systems wanting to make a shift towards integrated mobility, concrete and actionable tools that will guide them towards this new direction. The Task Force wanted to cover three major areas of mobility management: design for movement in conjunction with urban planning, demand management and mobility management through partnerships with other mobility actors.

Having taken part in integrated mobility projects in different regions, I know that one of the most important things to keep in mind is that there is no quick fix and that each situation is unique. So, I invite you to make good use of this toolbox and to be inspired to design your own solutions, ones that will best fit your urban context, environment and community.

Happy reading!

- *Laurent Chevrot*

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1.0

What is Integrated Urban Mobility?

The Canadian Urban Transit Association (CUTA) defines Integrated Urban Mobility as:

The ability for people to move easily from place to place according to their own needs.

By itself, this definition is quite general and open to discussion and interpretation. That is why CUTA supports the definition with the following statement:

For CUTA, Integrated Urban Mobility is a people-focused goal that:

- *Starts with public transport service connected to all modes of transport including walking, cycling, auto and alternatives to transportation;*
- *Enables door-to-door and seamless mobility throughout an urban area;*
- *Is designed for all segments of population.*

Understanding that Integrated Urban Mobility is a goal is important because it allows planners and practitioners to realize that further work and information is necessary to achieve the goal. This Integrated Mobility Implementation Toolbox provides the information and best practice examples that demonstrate what work and information is needed on the journey to Integrated Urban Mobility.

1.1 The Integrated Mobility Pathway

Achieving Integrated Urban Mobility requires integrated thinking and approaches. Consider the three broad elements that make up Integrated Urban Mobility – all modes of transport, all segments of the population, and a seamless approach to bringing them together to move about the city – and think of these more fully:

- A seamless approach to moving about in a community can only be achieved when land use, places, streets, infrastructure and technology are thought about in an integrated way that serves all users and all modes, and this can be called **Design for Movement**;
- All of the segments of the population that need to move about in a community represent the mobility demand, and understanding and influencing this can be called **Demand Management**;
- All of the modes and mobility approaches brought together represent the mobility supply in a community, and organizing these can be called **Mobility Management**.

Within each of Mobility Management, Demand Management, and Design for Movement there are many approaches and initiatives that can be considered and applied. The pathway to Integrated Urban Mobility (**Figure 1**) starts with these, and it is these approaches and example initiatives that are brought together in this toolbox. Each of these approaches and examples represents significant effort to plan, gain approval and funding, and to implement, and it is this effort within the three themes of Mobility Management, Demand Management and Design for Movement that this toolbox can be used to gain inspiration on how to achieve Integrated Mobility.

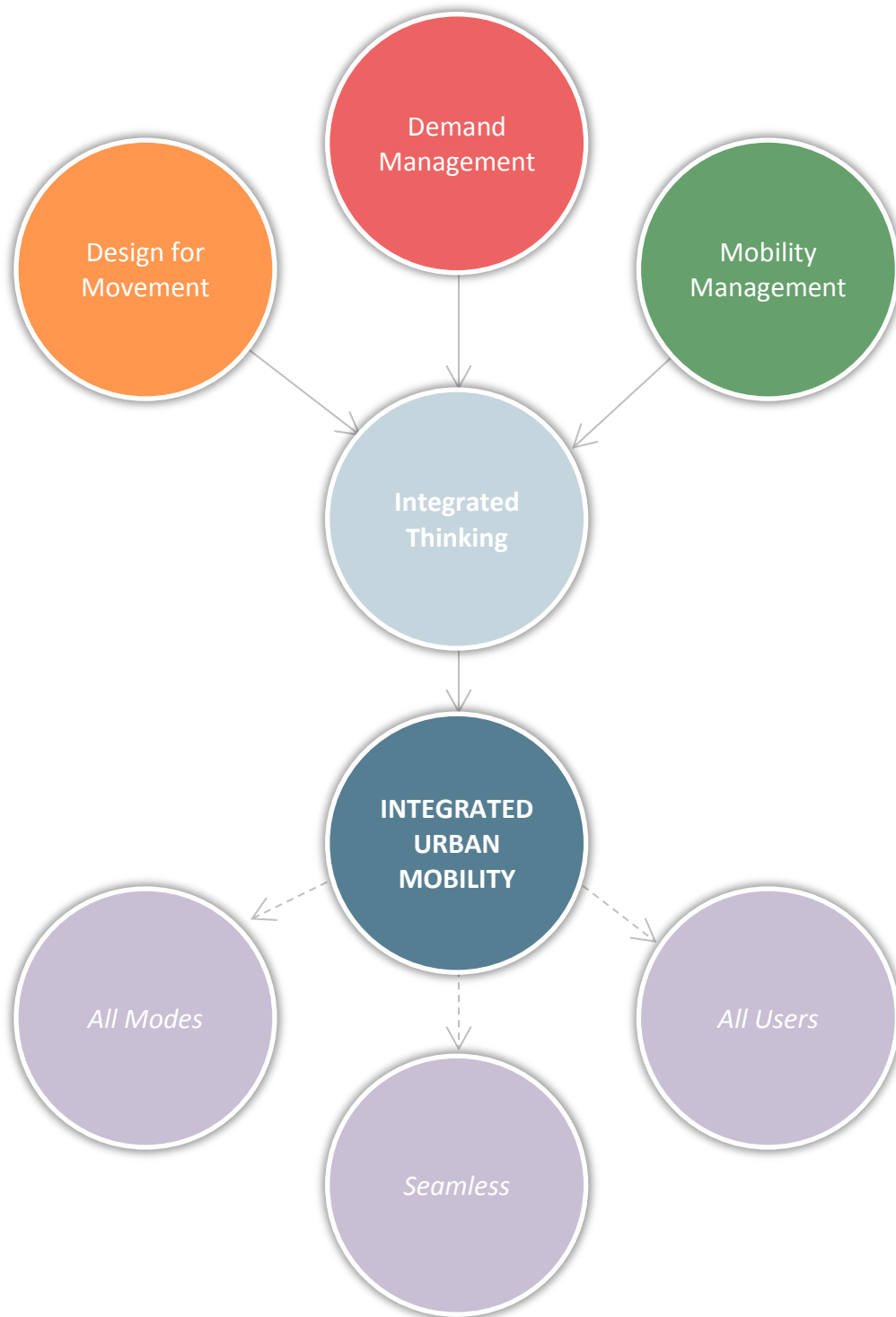
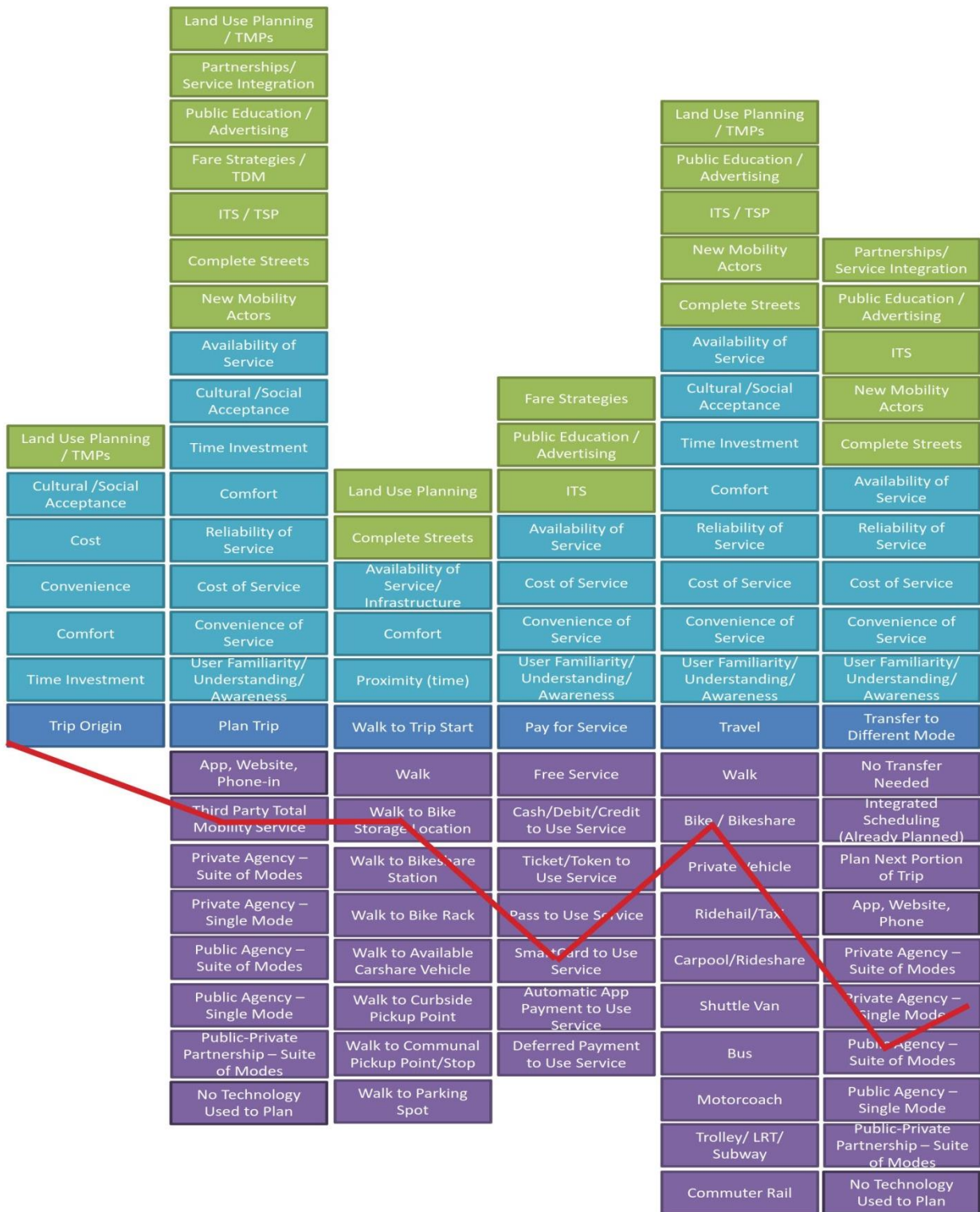


Figure 1: The Integrated Mobility Pathway

Another way of thinking about the Integrated Mobility pathway is from the user’s perspective. A user who needs to make a trip thinks about where they are starting, plans the trip, and uses one or more modes to complete the trip to their destination. Along the way, they have a multitude of influencers, barriers, experiences and options to draw from. This complex interaction is illustrated below.



Travel Path Direction





The Pathway to Integrated Mobility is clearly centred around the user, and transit and other mobility services must shape their offerings around the user's lifestyle needs in order to be successful.



2.0

State of the Industry

Recent years have seen significant changes in personal transportation trends, towards different behaviours and modes. Transit is at a critical turning point – a fork in the road. On one side, continued business-as-usual operations – traditional buses, diesel dependence, fixed route service, and modal isolation. On the other, a new form of service – varied vehicles, alternative propulsion, dynamic service, and modal connection, coordination, and integration.

Transit is going through a *transition*.

Looking Around...

Transit ridership has steadily grown. The reasons for this are varied and numerous. Heightened environmental values, coupled with the rising cost of car ownership and operation, have nudged many away from traditional personal auto ownership (particularly those within the “millennial” bracket, born between the 1980s and early 2000s). Improved transit advertising and the expansion of several systems to more usable, convenient networks and service levels has encouraged transit use, as has a more widely publicized and recognized link between transit use, active transportation, and health.



Mobility hubs have become building blocks of municipal planning. Growth plans, master plans, and transportation and transit master plans from several cities and provinces across Canada use intermodal mobility hubs as key cornerstones. These hubs are key places (often, carefully-designed *spaces*) for transfers between modes, municipalities, and/or regions. Designing communities around mobility hubs promotes sustainable land use development around transit nodes and corridors, supporting transit use.



Customers matter, more than ever. A wordcloud of Canadian transit agencies’ mission statements (Figure 2) is clear demonstration that customers are in the limelight of Canadian transit agencies. The past several years have seen agencies adopt passenger charters and advanced customer service strategies, with goals to improve customer safety, comfort, and convenience. The importance of public consultation and customer buy-in, and the impact it has on agencies’ decisions, is paramount. Additionally, it is increasingly acknowledged that transit agencies must understand customers on an individual, more personal level similar to retail and service providers, rather than the traditionally aggregated methods of public transit analysis.



Operating costs are rising faster than inflation. The volatile price of fuel and labour (considering salaries and benefits) is leaving transit agencies with ever-increasing operating costs. As a result, agencies are looking for alternative service delivery strategies to continue to provide excellent service in a more efficient manner.



Technology is transformational. The capabilities of technology have dramatically changed the transit industry. More widespread use of Intelligent Transportation Systems (ITS) improves operational efficiency. Automatic Passenger Count (APC) and Automated Fare Collection (AFC) data allows agencies to understand ridership on a specific route at a specific time, such that they can tailor the route to be most productive. The radical increase in personal mobile devices and an “on-demand” generation have created a need for instant information – transit riders desire real-time information, and comprehensive, dynamic, accessible-from-anywhere trip planning functionalities. Transit systems provide information and updates to their customers through social media platforms, and receive informal feedback from their riders through these same social media platforms as well as crowdsource information platforms (e.g., Waze). On one hand, transit riders have never been able to interact with transit systems on such a personal level. On the other hand, transit data has never been so public. The rising prevalence, importance, and access to open data has been critical. Almost 85% of all



transit miles traveled in the United States are on transit systems with open data¹. This General Transit Feed Specification (GTFS) data provides a consistent format for almost every transit app, and ultimately allows Google and other apps to provide transit directions to anyone, anywhere, at any time.

The economy is everyone's. Mobilized by advances in technology, the sharing economy is impacting the transit industry in unforeseen ways. The rise of carsharing, ridesharing, and crowdsourcing has created a shifting landscape for transit agencies. Fewer citizens have a desire to own, and instead seek to purchase the service or experience. This has led to significant growth in the peer-to-peer sharing economy (on platforms such as Uber, Lyft, and AirBnB). New mobility actors are often seen as competition, but can provide complementary partnership opportunities for transit agencies.



Accessibility is mainstream. Transit agencies have made significant strides towards accessibility for riders of all abilities. Along with enactment of provincial legislation in Ontario (the Accessibility for Ontarians with Disabilities Act), many provinces are looking to improve the accessibility of their systems as a best practice. Though much progress has been made, there is still a long way to go to make transit systems usable for all ages and abilities.



Transit has become more than a municipal matter. Regional transit governance structures have arisen in Canada's mega-regions, recognizing changing travel patterns and an increase in trips across municipal borders as economies become ever more intertwined. Where travel patterns have historically been directionally biased, they have become more randomized as industries disperse throughout regions and across several municipalities. TransLink in Metro Vancouver, Autorité régionale de transport métropolitaine (ARTM) in Montréal, and Metrolinx in the Greater Toronto and Hamilton Area have arisen out of a need to coordinate transit and other mobility services throughout large urban areas.



New funding sources are being found. Financial strains and growing pains of transit systems are being addressed through alternative cost-efficient operating strategies and newly created funding sources. Traditionally, large funding sources such as the New Building Canada Fund (NBCF) and P3 Canada fund awarded funding on a case-by-case basis, for a portion of large scale projects' costs. Current plans are to increase the funding available through these streams, and to provide funding specifically for municipal transit agencies mostly based on system ridership. This funding can be used for system modernization and state-of-good-repair projects. Community organizations provide an additional funding source for unique projects and initiatives, as does the use of new strategies such as land value capture.



¹ GTFS Data-Exchange. City-Go-Round, 2010 National Transit Database.

Suburbs are stepping up to transit. Car is not (entirely) king in suburbs anymore. Population and employment growth continues in urban and suburban areas, and the expectations for transit in such areas are rising. This, along with rising operational costs and the low density development and circuitous street patterns typical of suburban areas, create a challenging climate for cost-efficient transit. Many municipalities are investigating alternative delivery strategies as potential options in suburban areas.



New mobility managers are emerging. Several car companies have acquired a suite of mobility management companies in addition to their vehicle-based subsidiaries, recognizing the limited opportunities in the personal automobile industry alone. Daimler is the parent company of Ridescout, Car2Go, and Moovel, Toyota has invested in Uber, Lexus and Toyota have both partnered with Getaround, and Volkswagen, BMW, and GM are shareholders of Gett, Scoop, and Lyft, respectively². Mobility managers are also arising from data analytics companies, energy companies, and freight logistics companies.



The nine-to-five is no more. Transportation demand management (TDM) strategies, smart travel programs, increasingly flexible working arrangements, and an innovation-based economy have changed the parameters of regular travel. Commute times in most major Canadian cities have increased, impacting the economy and enticing further changes to typical commuter patterns.



...Looking Ahead

Environmental/emissions acts are coming into effect. Increasingly ambitious climate change action plans enacted by the Federal Government and the provinces will have an increasing impact on transit agencies. Impacts will range from increased governmental support for public transit, further adoption of alternatively-fuelled vehicles, and potential for changed revenue streams due to carbon pricing and cap-and-trade strategies.



Demographics are trending towards transit-dependence. An aging population, later average driver licencing age, and growing divide between income classes are creating a larger proportion of the population dependent on transit. This amplifies the need for accessible transportation options appropriate to all ages and abilities.



As communities change, so too must transit change. As communities look to implement transit sooner and earlier, transit must be flexible and adaptive enough to grow and change with the community. As suburban areas gradually change to mimic their urban counterparts, transit must adapt to changing urban forms and service expectations.



² Schmitt, Bertel. (2016, May 26). *Why Carmakers Are Suddenly Investing in Taxi Apps and Ride-Sharing – It's Not What Many Think*. Retrieved from <http://www.forbes.com/sites/bertelschmitt/2016/05/26/why-carmakers-suddenly-invest-into-taxi-apps-and-uber-and-its-not-what-people-tell-you/#44ebc82f7f4d>



Individuality is increasingly important. Transit systems must be planned according to human-centered design. With the rise of personal technologies and the ability for instant information access, transit riders desire transportation services that serve their individual needs and travel patterns.



Mobility is more than transit. Mobility-as-a-Service (MaaS) models are emerging, whereby mobility managers provide customers with a suite of mobility services catered to their needs. Recognizing customers' unique needs, MaaS models allow each individual to tailor their mobility package (including payment) to only the services they use.



Autonomous vehicles may soon be all around us. Timelines vary by automaker, but some are aiming to produce fully autonomous vehicles by as early as 2021³. The anticipated impacts of autonomous vehicles are extensive and not fully defined. Autonomous transit vehicles could significantly reduce operating costs by eliminating the driver labour cost. Personal vehicle kilometres traveled could decrease under a shared vehicle model, or increase as people are willing to travel farther provided they can accomplish other tasks while in transit. Land use may change to reduce parking needs in dense urban areas, pushing parking to exterior, less-intensely used areas. It is widely understood that autonomous vehicles will impact transit, transportation, and land use, but not fully understood exactly how.

...Looking Inwards...

CUTA's Transit Vision 2040 establishes a vision for integrated urban mobility wherein *people are able to move easily from place to place in urban areas according to their own needs, which is enabled by the coordination and optimization of all modes*. CUTA recognizes that achieving this vision *does not come without challenges and risks, but through collaboration between CUTA, transit systems, different levels of governments and industry, these challenges are not insurmountable*.

Faced with several challenges and the opportunity to rethink traditional service delivery strategies to provide service more efficiently, transit agencies are uniquely positioned to take on a larger mobility management role. A significant challenge to transit systems is the combined effect of transformative technologies – ridesharing services, carsharing enterprises, and car leasing clubs. These transformative technologies have altered travel behaviours and choices. By recognizing these technologies as opportunities instead of threats, transit agencies, through this *transition* period, have the opportunity to redefine themselves within the transportation supply chain – as an operator or as an integrator, aggregator, manager, operator, or partner.

This requires Integrated Thinking: Adopting the viewpoint of individual customers' lifestyle needs, aggregating these into mobility products and services, and ultimately providing the customer with a full mobility package and following-up with comprehensive measuring and monitoring.

³ Jaynes, Nick. (2016, August 26). *Timeline: The future of driverless cars, from Audi to Volvo*. Retrieved from <http://mashable.com/2016/08/26/autonomous-car-timeline-and-tech/#l6QiPocXWEq1>



3.0

How to Use This Toolbox

This Toolbox is intended as a guidebook towards integrated mobility. It is meant to be a resource for transit agencies wishing to advance their communities towards integrated mobility. The Toolbox highlights several examples of current integrated mobility solutions throughout North America and Europe, determines key challenges and lessons learned from these examples, and in doing so outlines potential courses of actions for transit agencies to work towards achieving integrated mobility.

The Toolbox is sectioned into the three themes of integrated mobility:

- Design for Movement;
- Demand Management; and
- Mobility Management.

Each theme is described, and several different strategies which work towards the theme are outlined. A handful of example initiatives and programs are presented for each different strategy, which demonstrate how municipalities are currently working towards integrated mobility.

Examples, initiatives and programs are presented in two forms. Examples with a high degree of detail are presented in tabular form. These examples and the information describing them were generally provided by the transit agency and/or municipality themselves (as such, no source is listed). Examples with a lower degree of detail are presented in paragraph form. These and the information describing them were generally researched on the internet (as such, a source is provided for further information).

3.1 Is This Toolbox For You?

Not all solutions will be applicable to all transit agencies, due to immense variations in size, service area, and ridership. As such, a scale is provided for each sub-theme, arranging types of examples by least to most transit agency involvement.

It is acknowledged that achieving integrated mobility requires cooperation from several “actors of mobility” – including, but not limited to, transit agencies, municipal transportation and planning departments, taxi and transportation network companies, bikeshare enterprises, carshare enterprises, and community organizations, among others. Transit agencies are uniquely positioned to take charge as “mobility managers” for integrated mobility.

Transit agencies are distinct from other government departments in that they are intimately familiar with their customers’ travel needs and patterns (and becoming more familiar with these will only strengthen the success of their transit service). No other department interacts with so large a portion of the community so frequently, over such large a geographic range. Transit agencies are therefore uniquely positioned to provide insight to other departments and entities regarding community travel patterns.

At the same time, while transit agencies are highly familiar with aggregate community travel patterns, they are less attuned to individual customer behaviour. Arising mobility entities such as rideshare and carshare enterprises collect and analyse highly detailed customer data, and in many cases are able to provide further insights on community travel patterns at an individual level.

Transit agencies are therefore positioned in a bridge point between government and mobility entities, and have a unique role and opportunity to manage the path forward towards integrated mobility.

Therefore, are you a transit agency interested in furthering integrated mobility in your community?

Are you interested in being a “mobility manager”?

If yes, this Toolbox is absolutely for you.

3.2 Where to Start?

The example initiatives presented in the following sections can be used as inspiration for municipalities wishing to advance integrated urban mobility in their communities. Determining which kinds of initiatives are most appropriate can be overwhelming. The flowcharts on the following pages are provided to assist municipalities in thinking through how they can move towards integrated urban mobility in a way which is most appropriate to their community.

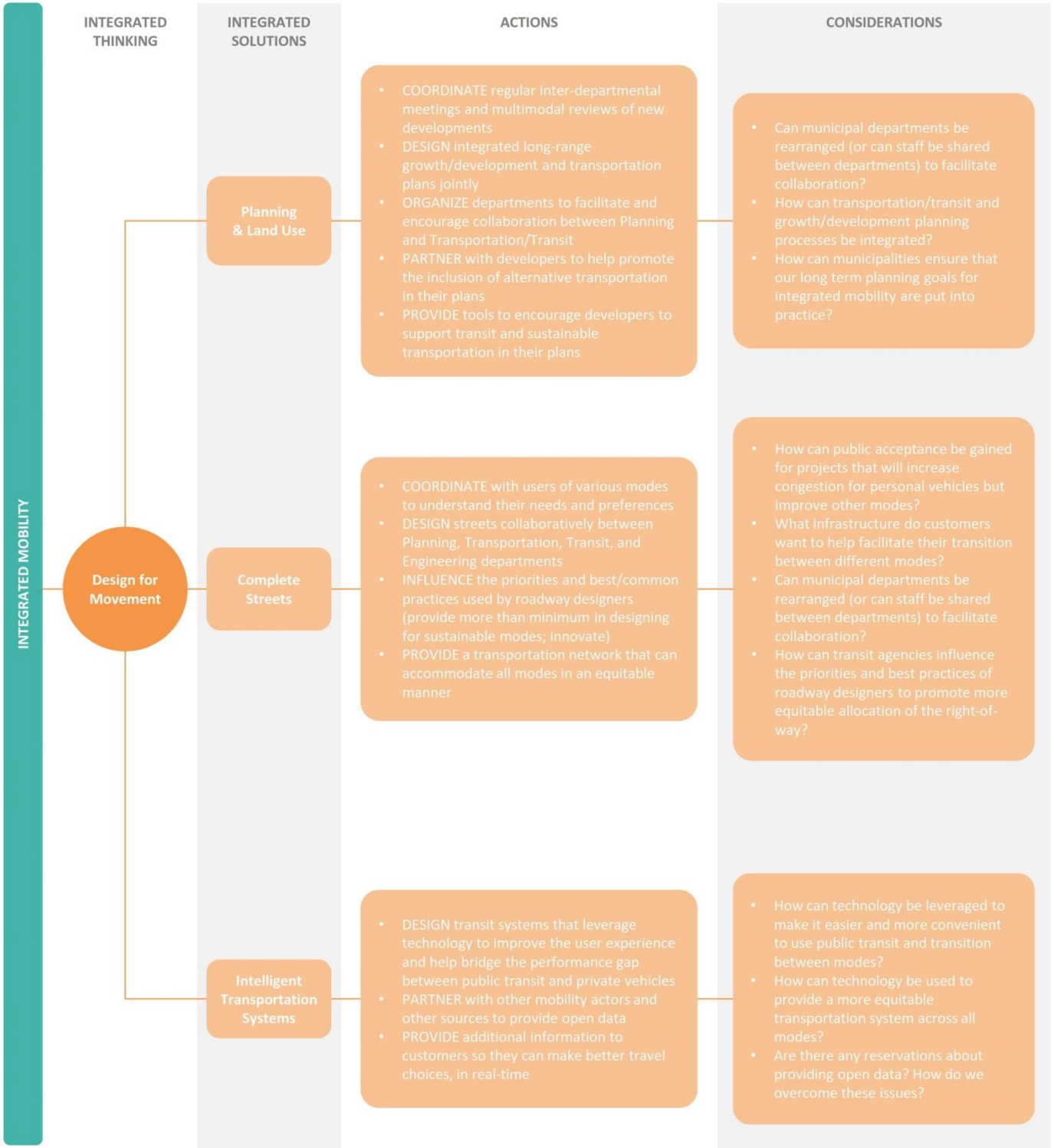
They describe potential actions towards integrated mobility in terms of six action words. CUTA uses these action words to explain that integrated urban mobility can be achieved by:

- **Designing** and optimizing transportation services, facilities and built environment to operate together, with emphasis on accessibility, ease of use and sustainability;
- **Organizing** service providers consisting of public, private and not-for-profit operators and owners;
- **Providing** accurate, timely and useful information to travelers and coordinating services using modern information technologies;
- **Influencing** transport demand to encourage sustainable behaviours and optimize the use of publicly available transportation;
- **Partnering** with focus on collaborative, coordinated and high quality service delivery, and;
- **Coordinating** actions from all levels of government responsible for finance, land use planning, economic development, and transportation.

These action words are used to suggest potential next steps towards integrated mobility in the flowcharts on the following pages.

3.3 Future Updates

While the example initiatives and programs described in this Toolbox are current at the time of writing, it is important to keep in mind that the concept of Integrated Mobility is rapidly changing. CUTA plans to provide updated resources to members on an ongoing basis as significant developments occur and as further trends become established.



INTEGRATED THINKING

INTEGRATED SOLUTIONS

ACTIONS

CONSIDERATIONS



Pricing Policies & Incentives

- INFLUENCE transportation patterns and choices through pricing policies
- PARTNER with other organizations to provide incentives to customers
- PROVIDE price incentives to promote increase usage of transit and sustainable transportation

- What are desired transportation behaviours and how can these be incented?
- How can public transit be made economically accessible to a wider ridership base?
- How should services be priced to provide quality service to customers while remaining economically competitive with other modes and staying within a constrained budget?

Smart Travel Programs

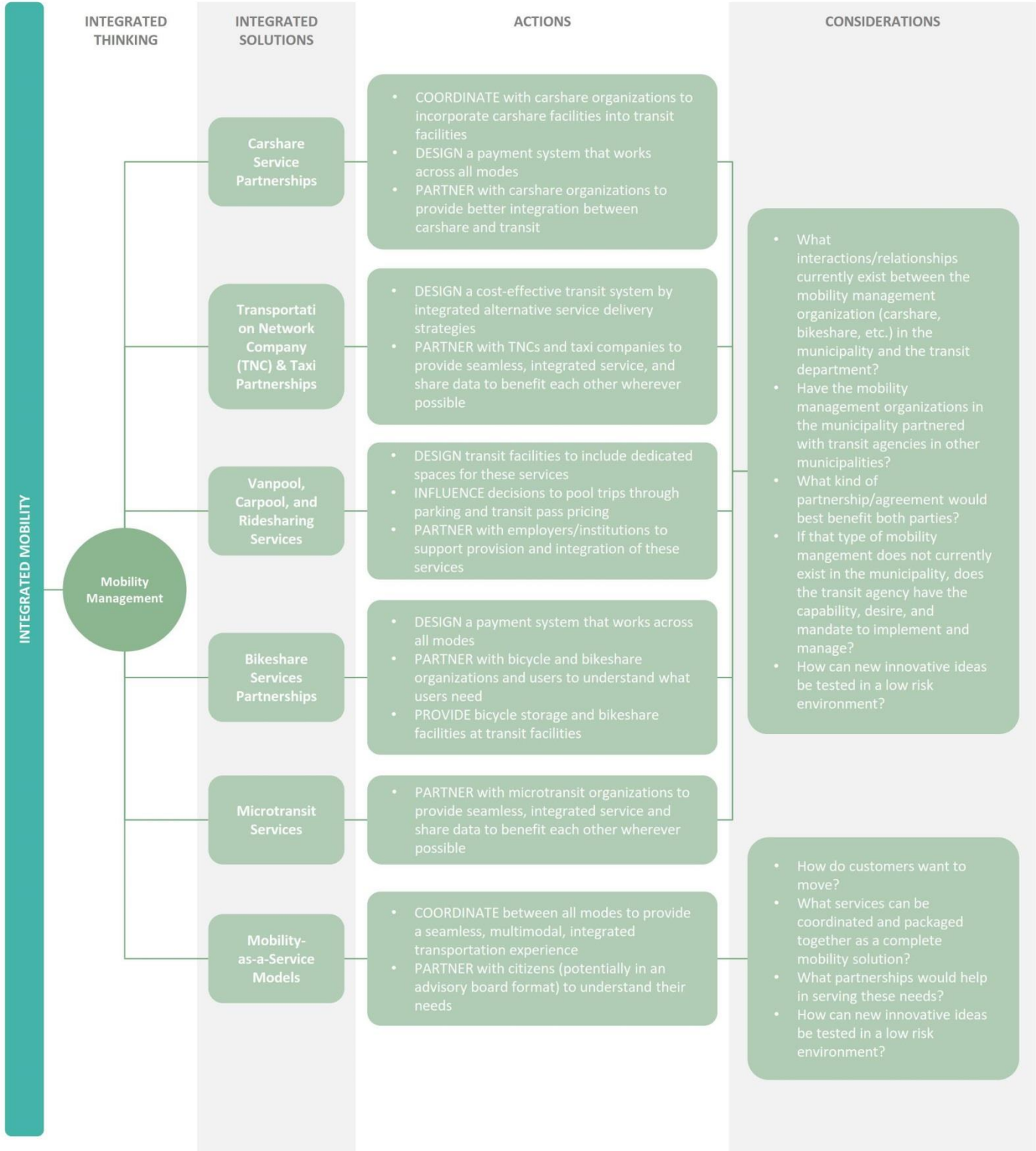
- COORDINATE with employees/users to best understand their needs
- DESIGN a program that caters to users' needs first
- PARTNER with major employers/institutions to develop programs to incent sustainable transportation

- Who/where/what are major attractions/destinations? How can transportation options to/from these be improved?

Education /Outreach

- PARTNER with mobility research and advocacy groups to stay informed
- PROVIDE travel training and additional education to those who need it

- Who are key groups who may benefit from education/outreach?
- What is the main message to be communicated?

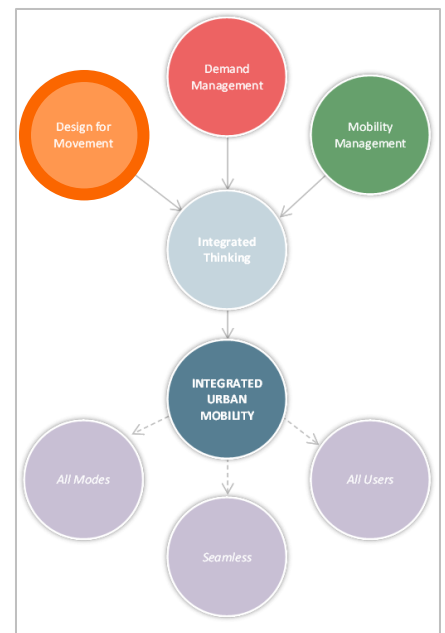




4.0 Design for Movement

Design for Movement describes the bringing together of the planning and design of land use, places, streets, infrastructure and technology in a seamless and integrated way that accommodates all modes of transportation and serves all of the people that need to move about in a community.

This means that master plan documents for land use and transportation in a city or town are coordinated and mutually supportive, and accommodate multiple transportation modes and approaches for residents. It means that communities, neighbourhoods and nodes incorporate transit oriented and multi-modal oriented design principles. It means that streets become places to be and accommodate all modes and users through the use of complete street design principles. Finally, it means that intelligent transportation systems (ITS) approaches are incorporated into the planning and design of places and streets in order to improve safety and enhance individual and overall mobility.



Example initiatives and programs for Design for Movement described in this toolbox are:

Planning and Land Use

- Multimodal Reviews for New Developments
- Long Range Integration of Land Use and Transportation Planning
- Mobility Focused Transportation Master Plans
- Integrated Mobility Plans

Complete Streets

- Bike Treatments
- Carpooling/Carsharing Treatments
- Transfer Hubs
- Bus Treatments

Intelligent Transportation Systems

- Smartcards, Smartphone Tickets, and Other Electronic Payment Methods
- Transit Signal Priority
- Real-Time Information and GPS
- Open Source Data

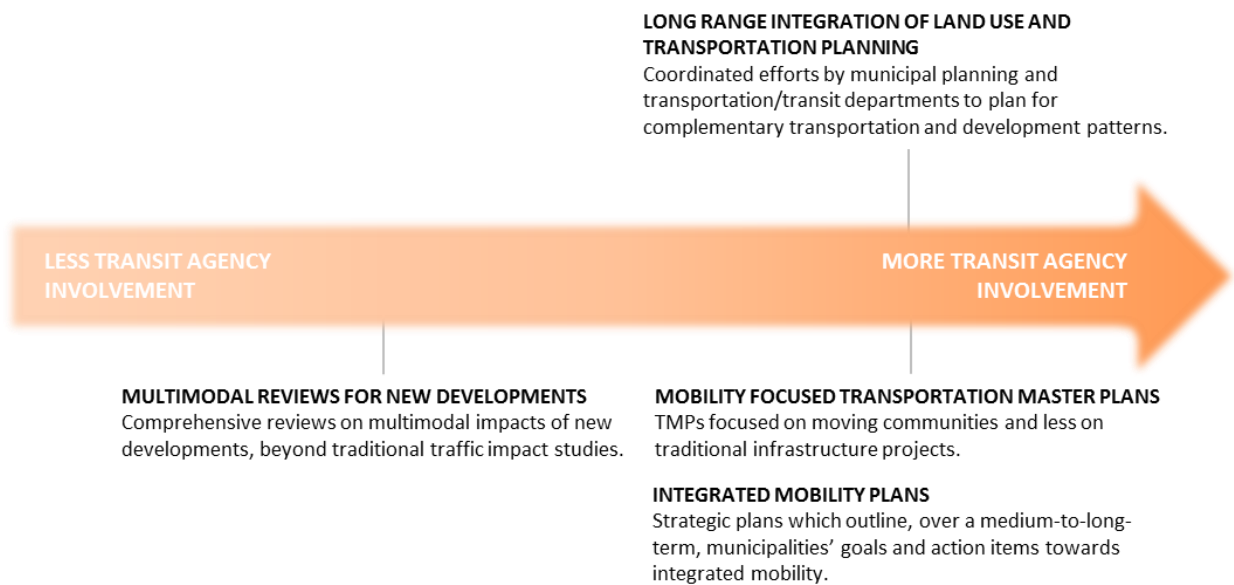
4.1 Planning and Land Use

Transportation Master Planning and land use planning help define and guide the growth and structure of cities. Some municipalities have recently created mobility-focused Transportation Master Plans instead of more traditional auto-focused plans (Mississauga, Ottawa, and the Region of Waterloo in Ontario). Other municipalities have reframed these plans altogether, into integrated mobility plans (Sherbrooke, Quebec, and Calgary, Alberta).

Taking an integrated approach to transportation and land use planning processes can help municipalities manage traffic growth and promote sustainable modes by promoting high density developments that are well served by a variety of modes and aid in strategically investing limited resources to have the greatest overall impact. As an example, the City of Bellingham, Washington, completes multimodal reviews for all development plans to ensure that pedestrian, bicycle, and transit needs are met by each plan.

Transit oriented development (TOD) is a planning practice that combines land use planning and transportation planning with the goal of designing communities that are less dependent on private vehicles. Typically, a public transit hub is the focal point of transit oriented design. Multi-modal oriented development (MMOD) is similar, but places a greater focus on overall mobility and seamless integration between all modes rather than just ensuring that residents have good access to public transit. Supporting MMOD are emerging multi-modal level of service and multi-modal transportation impact study approaches that assess the implications of the plan or development on all modes and guide the implementation of more sustainable solutions. This can be achieved through integration of long-range planning for transportation and land use, as has been done in Calgary, Alberta, and Saskatoon, Saskatchewan.

Examples of integrated and multi-modal approaches to transportation planning and development are summarized in the following sections. The graphic below depicts the relative level of transit agency involvement of each type of integrated/multi-modal approach to transportation planning and development.



4.1.1 Multimodal Reviews for New Developments

- ▷ *Comprehensive reviews on multimodal impacts of new developments, beyond traditional traffic impact studies.*

TRANSPORTATION REVIEW FOR DEVELOPMENT – BELLINGHAM, WASHINGTON, UNITED STATES

Transportation planners at the City of Bellingham in Washington State review all development plans with respect to mobility. Specific attention is paid to ensuring that pedestrian, bicycle, and transit needs are met within each plan. Developments that are expected to generate more than 50 PM peak trips are also required to have a transportation impact analysis. These types of requirements are relatively common for cities in North America and help manage growth and maintain alignment with long-term mobility goals.

① <https://www.cob.org/services/planning/transportation/Pages/review-new-development.aspx>

4.1.2 Long Range Integration of Land Use and Transportation Planning

- ▷ *Coordinated efforts by municipal planning and transportation/transit departments to plan for complementary transportation and development patterns.*

INTEGRATED LAND USE AND TRANSPORTATION MASTER PLAN – CALGARY, ALBERTA, CANADA

Program Description	The City of Calgary has an integrated land use and transportation master plan. It was developed through a process called “Plan It Calgary” in 2007-2009. The City of Calgary makes informed development decisions and capital investments based on this 60-year integrated plan. The vision of the plan is to help Calgary with triple bottom line principles, sustainability principles, containing the cost of urban sprawl, and mitigating the impacts of auto-oriented travel.
Implementation	<p>City Council approved the new Municipal Development Plan/Calgary Transportation Plan in 2009. The Complete Streets Guide was approved in 2014. It stemmed from consensus on City Council that the current path of land use and transportation investments were unsustainable. A review was conducted in 2006 of the progress toward the previous transportation plan goals. It was concluded that land use and mobility should be planned at the same time.</p> <p>Partners and stakeholders involved in the process included Planning & Development, Transportation, development industry, and many external stakeholders.</p> <p>Changes that resulted in the new master plan required updates to standard development agreements. It also necessitated changes in many programs/policies to align with the new 60 year vision.</p>
Outcome	<p>Success of the plan is measured through periodic reports to Council (MDP/CTP Monitoring Program) and through reporting on performance measures with every 4-year Business Plan and Budget.</p> <p>Transit customers have generally responded favourably; however, what was good for the car was generally good for the bus and investments in Complete Streets have often favoured active modes.</p>
Next Steps	An update to the land use and mobility plan is tentatively scheduled for 2019. New trends will be incorporated into the new plan (e.g. land use trends, mobility trends, technology trends, etc.).
Keys to Success	<ul style="list-style-type: none"> • Teamwork is required to convey the benefits of multi-modal investments. Partnerships between Roads/Streets business units and Transit business units are the keys to success.
Challenges Faced	<ul style="list-style-type: none"> • The TMP requires significant change from current development patterns. Retrofits of existing facilities are challenging (e.g. changing auto-oriented streets into “Complete Streets”).

GROWING FORWARD – SASKATOON TRANSIT, SASKATOON, SASKATCHEWAN, CANADA

Program Description	The City of Saskatoon approved its Growing Forward plan in the first quarter of 2016. This plan guides the growth of Saskatoon to a population of 500,000 residents. It focuses heavily on enhanced transit options including BRT, park and ride and complete street design. The goal of this plan was to guide growth to 500,000 residents with a great deal of consideration provided to sustainability and ease of moving around.
Implementation	The program was adopted by Council in 2016. Its implementation was the result of the need to establish a long range plan for City of Saskatoon growth and further develop the effectiveness of the Transit System. Development of the plan was contracted out and internal City of Saskatoon staff from Transit and Planning and Development provided additional resources. Consultation for the plan occurred at the resident level. The Official Community Plan (OCP) will have to be changed as well as a number of policies affecting land use, building construction and zoning.
Outcome	As the plan is less than one year old, there is little evidence to measure success. However, recommendations from the Growing Forward plan have led Saskatoon Transit to develop a High Frequency Corridor along a major street and similar corridors are in development. The program has been challenging to manage; however, customer feedback has generally been positive.
Next Steps	High frequency corridors will be expanded throughout Saskatoon over the next two years. The remaining recommendations will be addressed as per the timeline are provided within the plan. This will result in park and rides and demand/flexible routing. Saskatoon Transit has also engaged in very early discussions with the health region regarding their shuttle programs. Further, they have started exploratory conversations with taxi companies regarding potential to provide first last mile services in the North Industrial Area of Saskatoon.
Keys to Success	<ul style="list-style-type: none"> • Coordination between internal and external partners, most noticeably Business Improvement Districts and the bus riders of Saskatoon.
Challenges Faced	<ul style="list-style-type: none"> • Finding dedicated funding for the implementation of the recommendations became an issue.

4.1.3 Mobility Focused Transportation Master Plans

▷ *TMPs focused on moving communities and less on traditional infrastructure projects.*

MOBILITY-FOCUSED TRANSPORTATION MASTER PLAN – MI-WAY (MISSISSAUGA TRANSIT), MISSISSAUGA, ONTARIO, CANADA

Program Description	Service Development staff are involved in many long range city planning projects in Mississauga, such as transportation master plans, district plans, secondary plans. They provide input, comments, and feedback to these projects on a regular basis. The City of Mississauga recently put out an RFP to update its current transportation master plan. The goals of this update are to define the vision of Mississauga's transportation future, illustrate the current and projected state of the transportation network, highlight foreseeable opportunities and barriers, and lay out strategic goals and action items to advance the City's transportation priorities.
Implementation	The Transportation Master Plan (TMP) RFP is out and the study commencement expected to be early 2017. One of the key factors considered during the RFP process was to reduce private automobile dependence in Mississauga. Partnerships and stakeholders for this project are all internal city departments, municipalities surrounding Mississauga and their associated transit authorities, Transport Canada, MTO, Metrolinx, Conservation Authorities, private bus companies, taxi companies, and various community groups.
Outcome	The project will be finalized with the successful completion of the study, resulting in an official TMP report.
Next Steps	MiWay's next steps are to continue working with City staff to find out ways to support mobility options. They are working with City staff, Regional projects, and GTHA peers to explore new mobility options, such as microtransit and on-demand services.
Keys to Success	<ul style="list-style-type: none"> • Stakeholder engagement • Having the clear target of reducing auto dependency
Challenges Faced	<ul style="list-style-type: none"> • There is no clear champion of these initiatives and municipalities are implementing small scaled projects within their boundaries. It could be more effective when the approach and strategies are systematically adopted and implemented in organized matter under provincial or federal levels.

TRANSPORTATION MASTER PLAN – OTTAWA, ONTARIO, CANADA

<p>Program Description</p>	<p>In 2013, the City of Ottawa adopted a new transportation master plan. Examples of integrated mobility policies within the plan include:</p> <ul style="list-style-type: none"> • “Action 4-2: Expand the pedestrian network” places strong emphasis on the provision of “pedestrian facilities accessing transit or linking neighbourhoods”. This action is not just words but is backed by funding under the planning horizon to 2031 in the amount of \$26M for general community links including in transit-oriented development areas and \$40M for multi-use pathway structures such as pedestrian and cycling bridges across the Rideau River and Rideau Canal. • “Action 5-2: Implement the Cycling Network by 2031” provides a total of \$70M for cross-town bikeways, transit-oriented development links, community links, etc. • “Action 6-4: Make rapid transit stations convenient, comfortable and accessible to all users including pedestrians and cyclists”, which relates to the rapid transit network expansion and the existing network. • “Action 8-12: Provide parking facilities for more sustainable modes of travel.” <p>The TMP’s Transportation Vision is “In 2031, Ottawa’s transportation system will enhance our quality of life by supporting social, environmental and economic sustainability in an accountable and responsive manner.” The elements to achieve this include:</p> <ul style="list-style-type: none"> • Reducing automobile dependence by giving priority to public transit in accommodating future travel demand, making walking and cycling more attractive than driving for short trips and encouraging shorter trips and travel alternative like telework; • Meeting mobility needs by providing an integrated system of multi-modal facilities and services; and • Integrating transportation and land use in recognition that these two aspects of urban development must work together.
<p>Implementation</p>	<p>These policies/actions have been implemented since adoption of the TMP in 2013. They come from City Council approval of the TMP and are required to be followed in decisions of the municipality. This includes decisions under the City’s direct control or by way of City planning approvals of applications for development made by other parties, but requiring City approval under the Ontario Planning Act or other legislation.</p> <p>The lead city department is the Planning and Growth Management Department with involvement of the other departments responsible for traffic services and for OC Transpo.</p>
<p>Outcome</p>	<p>The 2013 TMP provided new and stronger direction (compared to the old 2008 TMP) on key themes of sustainable transportation, complete streets, active transportation, public transit and transit-oriented development. Direction from the TMP resulted in the creation and implementation of Complete Street Framework that is applied to all municipal activities involving new streets or renewal of old street infrastructure. A Multi-Modal Level of Service indicator is under development and will prove to be useful.</p> <p>Financial commitments as set out in the TMP for pedestrian and cycling facilities have been firmly secured for this term of Council (2014-2018) and implementation is underway. Construction is underway on Phase 1 of the City’s east-west LRT project (Confederation Line) with EA work completed and funding applications underway for Phase 2 expansions. Success is evident both by seeing things being constructed, e.g. bikeways, LRT line, and by public support for improvements to transit and active modes of transportation.</p> <p>The TMP is normally updated every 5 years and includes a reporting component at that time. Individual projects may be subject to survey or eco-counter (built in counters) of usage of a new facility.</p> <p>The public reaction to this plan has been continued demand for more and sooner implementation of complete streets, cycle tracks, and pedestrian and cyclists bridges. For example, the new Adàwe Crossing bridge, open for less than a year, has had summer/fall month usage levels of 90,000 to 100,000 crossings/month showing the demand for such a facility.</p>
<p>Next Steps</p>	<p>Continued implementation of the policies and actions that the TMP directs. The next TMP will build on the policies and success of what is being done today</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Public and political support is important along with funding (for both staff and project implementation). • Revisiting old paradigms is necessary.
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • Measuring/reporting can be challenging as it is relative easy to report the number of kilometers of new sidewalks or cycle tracks constructed each year or usage counts via eco-counters but less tangible to measure is the growing public acceptance of increases in integrated mobility . • Any change to the status quo meets with resistance from some. Examples of success are useful to point to and help breed more success. • Existing planning and transportation engineering processes, such as traffic analysis, Transportation Impact Assessment and geometric design guidelines are not necessarily supportive of non-car modes.

MOVING FORWARD 2031 – GRAND RIVER TRANSIT, REGION OF WATERLOO, ONTARIO, CANADA

<p>Program Description</p>	<p>Moving Forward 2031, the Region’s current TMP, was approved by Council in 2010 in response to several new provincial and local policy initiatives that had a significant influence on the future direction of transportation in Waterloo Region. It includes a set of policies that guide how future transportation direction and investments are made throughout the Region. It places priority on moving goods and people efficiently and on shaping the community to become more vibrant, compact and sustainable while also planning for automobiles, which continue to be an important means of travel in the Region. The TMP was developed in collaboration with the Cities of Cambridge, Kitchener, Waterloo, and the Townships of North Dumfries, Wellesley, Wilmot and Woolwich.</p> <p>The Region’s current TMP involved significant public consultation and resulted in a vision to have a transportation system that would accomplish the following goals: Optimize the Transportation System; Promote Transportation Choice; Foster a Strong Economy; and Support Sustainable Development.</p> <p>The TMP was developed in coordination with ION light-rail transit, which was approved separately. Its main vision was for a supportive transit strategy that would feed ION operating within the Central Transit Corridor. The goal of the plan was to increase peak hour transit mode share Region-wide from 4% to 15% by 2031.</p>
<p>Implementation</p>	<p>Targeted property tax increments to support the ION and TMP implementation have been approved by Council every year and have led to increased transit service hours in advance of ION service commencing. The project also required an agreement to support transit ridership growth in Cambridge, in advance of ION light-rail transit service being extended. The Cambridge Supportive Transit Strategy provides \$1,000,000 per year of funding to the City of Cambridge to increase transit ridership, and supports projects such as stop improvements, service improvements, TDM initiatives, free transit and TravelWise membership.</p> <p>Partners and stakeholders for the TMP include the Region of Waterloo (Corporate Services Department; Planning, Housing and Community Services Department; and Transportation & Environmental Engineering Department); Provincial ministries and agencies (e.g. MTO, Metrolinx, etc.); Area municipalities; and the general public.</p>
<p>Outcome</p>	<p>The TMP has resulted in several successes, including: Achievement of Grand River Transit 2016 ridership target; Increased ridership on certain iXpress routes; promotion of commute mode shifts to sustainable modes of travel through the Region’s TravelWise program; improved accessibility on Grand River Transit buses; continued implementation of planned iXpress routes; increased use of EasyGO electronic travel information system; development and approval of an Active Transportation Master Plan; and an approximate doubling of the total length of cycle lanes in the Region, and appropriate bicycle racks on all Grand River Transit buses.</p> <p>Lessons Learned from the project include:</p> <ul style="list-style-type: none"> • Youth/Students tend to be more satisfied with the transportation system versus commuters tend to be frustrated with congestion levels especially commuting to the Greater Toronto Area • Residents within the Region seem comfortable with the choice of their current mode of travel and are of the opinion that any efforts made to change their status quo may be beneficial for others (i.e., the general public) and not necessarily for them, irrespective of the type of change. Good TDM measures to achieve travel behavioural change will be required.
<p>Next Steps</p>	<p>The current TMP is in the process of being updated. The new TMP would identify policies and projects to meet the Region’s transportation needs over the next 25 years. These include where and how to invest in Regional road improvements, traffic controls, public transit service, cycling and walking facilities, and managing travel demand. Moving Forward would also address transportation needs related to provincial highways within the Region, travel to and from the Region, emerging transportation trends, and passenger rail and air service. In addition to Moving Forward, the Region is currently working on the Environmental Assessment for Stage 2 on the ION light-rail transit system, extending service to Cambridge.</p> <p>The Region seeks to maintain and carry on the goals outlined in the 2010 TMP to Moving Forward while focusing on promoting transportation choice, investing in public transit, cycling and walking, and reducing the reliance on travelling by driving alone. Part of Moving Forward will examine whether changing paradigms in technology and/or society, such as Mobility as a Service, Connected/Autonomous Vehicles, and the sharing economy, will have relevance to the Region and whether/how the Region can play a leadership role in their development or regulation.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Consistent investment in transit, and construction of ION LRT, has demonstrated a commitment to the service. • Commitment by Council to the vision and goals of the Regional Growth Management Strategy, a 2003 policy, has been instrumental in seeing long term policies like these come to fruition.
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • Keeping up with evolving trends in transportation and their effects on Regional transportation such as: climate change, public health, social equity, aging population, new technologies, expanded travel choices, safety, etc. • Regional residents continue to drive, especially in single occupant vehicles, and household auto ownership is high • Obtaining dedicated funding for active transportation • Implementing Transportation Demand Management measures, and affecting behavioural changes • Parking is integral to transportation outcomes, but is generally managed by area municipalities (not the Region)

4.1.4 Integrated Mobility Plans

- ▷ *Strategic plans which outline, over a medium-to-long-term, municipalities' goals and action items towards integrated mobility.*

SHERBROOKE SUSTAINABLE MOBILITY PLAN (2012-2021) – SHERBROOKE, QUÉBEC, CANADA

The Sherbrooke Sustainable Mobility Plan was created by the *Centre de mobilité durable de Sherbrooke* (Sherbrooke Sustainable Mobility Centre), a joint venture between the City of Sherbrooke and the Société de transport de Sherbrooke. It outlines the 33 action items to be completed over a decade in order to implement the sustainable mobility vision outlined in the City's master plan.

Each action item is described in terms of the existing context and objectives, and other action items that are prerequisites or corequisites for effective implementation. There is also an outline of phasing (including long-term goals beyond the 10-year horizon of the plan), cost, key partners involved, and the department/agency responsible for implementation.

The action items are grouped into the seven themes of the mobility plan:

- Planning and urban development
- Roadways and vehicle traffic
- Parking
- Carpooling and carsharing
- Active transportation
- Public transit and integrated mobility
- Accessibility for people with reduced mobility

The key action items for public transit and integrated mobility include:

- Reevaluate the routes, vehicles, frequency, and other aspects of the transit system once one or more BRT routes are operational in Sherbrooke.
- Develop a passenger information system with online trip planning, mobile apps, and real-time displays at major stops and onboard buses.
- Implement more useful and cost-effective transit service in suburban and exurban communities, and consider integrating transit with taxis, carpooling, or carsharing.
- Integrate urban transit service in Sherbrooke with regional transit services to other towns and cities in the Eastern Townships.
- Implement a new multimodal fare structure and single fare payment system that is valid on both urban and regional transit.
- Study and develop a plan to ensure that all future vehicles put on the road in Sherbrooke will be electric, including cars, trucks, and buses (implemented in 2025 at the earliest).

① https://www.ville.sherbrooke.qc.ca/fileadmin/fichiers/Mairie/plansstratpol/Plan_de_mobilite_durable_de_Sherbrooke_-_Fiches_action_-_lowres.pdf

INVESTING IN MOBILITY PLAN – CALGARY, ALBERTA, CANADA

<p>Program Description</p>	<p>The City of Calgary has a 10-year “Investing In Mobility” plan with programmed investments in active modes, transit, goods movement, traffic optimization and asset management/lifecycle replacement. Funds are assigned to buckets for each mode to avoid overspending on new infrastructure in easy to spend areas, such as interchanges in Greenfield areas.</p> <p>The overall goal of the plan is to help Calgary become more economically and environmentally sustainable, help reduce the cost of urban sprawl, and mitigate some of the impacts of auto-oriented travel.</p>
<p>Implementation</p>	<p>The Investing in Mobility plan covers programmed investments from 2015 to 2024; however, the approach of assigning funds to “buckets” was adopted in 2012. One of the driving ideologies for the plan was that City Council believed that the current path of land use and transportation investments were unsustainable. Additionally, the Transportation department agreed that greater investments in asset management and lifecycle replacement were required.</p> <p>The plan was developed with input from Transportation, Planning & Development, development industry, and many external stakeholders. Shorter-term business plans and budgets were adjusted to fit with the new funding program and capital investment strategy.</p>
<p>Outcome</p>	<p>Success is measured through reporting on the status of projects and funding with every 4-year Business Plan and Budget.</p> <p>Transit customers have generally responded favourably due to investments in transit capital projects and lifecycle repair of aging assets. Walking and cycling access to key stations has improved.</p>
<p>Next Steps</p>	<p>“Portfolio management” is now being introduced as a means of introducing further rigour to the process.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Teamwork is required to convey the benefits of multi-modal investments. • Partnerships between Roads/Streets business units and Transit business units is key to success.
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • There are pros and cons to “locking in” a 10-year vision for transportation investments. Growth in the City of Calgary region has exceeded expectations in most years leading up to 2015.

4.2 Complete Streets

The term “street” refers to everything within the right-of-way, from the face of one building to the face of the opposite building. Streets are comprised of many elements, including trees, benches, patios, sidewalks, boulevards, and paved roadways. Following this logic, the term “complete street” refers to a street that has been designed to support overall mobility, goods movement, and place making. For important neighbourhood main streets, in particular, this often this means reallocating area that was traditionally dedicated to private vehicles to support sustainable modes and create areas for people to interact.

To support the design of complete streets, a wide variety of guidelines and standards documents are provided by organizations such as the Transportation Association of Canada (TAC), the Provincial Ministries of Transportation, the Institute of Transportation Engineers (ITE), and the National Association of City Transportation Officials (NATCO). Some communities are also looking beyond these North America sources to examples of complete street implementation in other parts of the world, and incorporating elements of the design guidelines used abroad.

Complete streets can be created through many elements, including:

- Bike treatments, as has been done along the Pembina Highway in Winnipeg;
- Carpooling/carsharing treatments, as has been done along the Queen Elizabeth Way in Ontario;
- Transfer hubs for transferring between many modes, such as in Bremen, Germany, and the Region of Waterloo, Ontario; and
- Bus treatments, such as along Douglas Street in Victoria, British Columbia, and in Laval and Gatineau, Quebec.

Examples of efforts being made to design more complete streets are summarized in the following sections. The graphic below outlines the relative level of transit agency involvement for each strategy towards complete streets.



4.2.1 Bike Treatments

- ▷ *Bike boxes, cycle tracks, exclusive bike lanes, secured bike storage.*

PEMBINA HIGHWAY BUFFERED BIKE LANES PROJECT – WINNIPEG, MANITOBA, CANADA

In 2014, the City of Winnipeg rehabilitated one of its major thoroughfares, Pembina Highway. During the rehab, buffered bike lanes were added to each side of the road between Markham Road and Chevrier Boulevard (approximately 2.6 km). The bike lanes are buffered from the first vehicle travel lane by evenly spaced orange poly-posts. A unique feature of the design was the treatment at bus stops, which entailed bus stop islands with bike ramps that direct cyclists behind the stop and adjacent to the sidewalk. This design is intended to prevent weaving or “leap frogging” that can commonly occur between buses and cyclists in the presence of curb lane bike treatments.

- ① <http://www.winnipeg.ca/publicworks/pedestriansCycling/activeTransportationNetwork/background/2014-PembinaBufferedBikeLanes.stm>

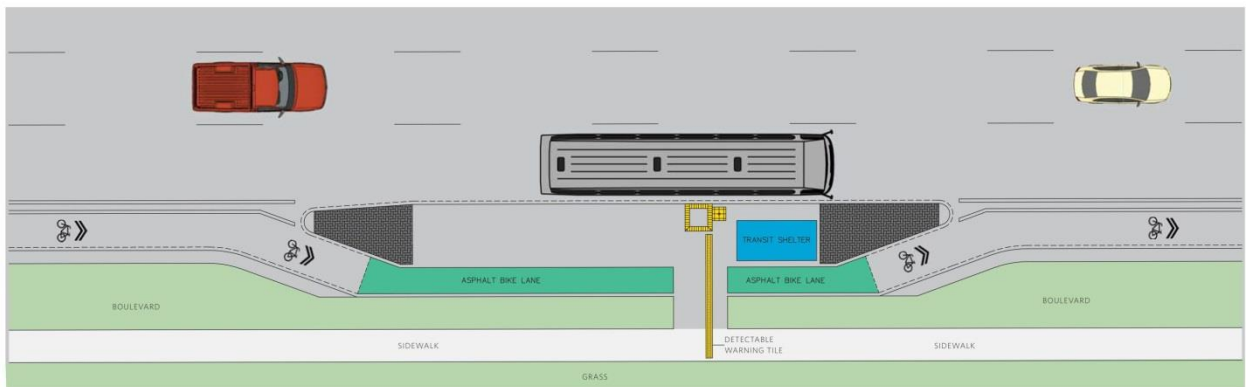


Figure 3: Bike Lane Treatment at Bus Stops

<http://www.winnipeg.ca/publicworks/construction/majorProjects/pembinaRehab.stm>

4.2.2 Carpooling/Carsharing Treatments

- ▷ *HOV/HOT lanes.*

QUEEN ELIZABETH WAY HIGH-OCCUPANCY TOLL LANE PILOT – ONTARIO, CANADA

In June 2016, the Province of Ontario launched a high-occupancy toll lane project on the Queen Elizabeth Way (QEW). The lanes run for approximately 16.5 km in both directions between Oakville and Burlington. The HOT lanes will be available to vehicles with two or more persons, buses, taxis, emergency vehicles, vehicles with green licence plates, and vehicles with a special permit. Approximately 1,000 permits are being sold during the pilot. These permits allow single-occupancy vehicles to use the HOT lane. The permits cost \$180 and have a validity of three months. Various technologies related to tolling, compliance, and performance will be tested during the pilot.

- ① <https://www.ontario.ca/page/high-occupancy-toll-hot-lanes>
- ① <http://www.cbc.ca/news/canada/toronto/qew-hot-1.3763083>

4.2.3 Transfer Hubs

▷ *Intermodal transfer hubs.*

INTEGRATED MOBILITY HUBS – BREMEN, GERMANY

The City of Bremen, Germany has an integrated mobility strategy that promotes seamless transitions between cycling, car sharing, and public transportation. The system relies on several major mobility hubs in conjunction with numerous smaller “mobil.punkt” stations that are spread out across the city. These hubs serve as the meeting point of each mode and have computerized information booths that can be used to help plan trips. Services are further integrated through the use of smartcards. A smartcard can be used for many functions including unlocking car sharing vehicles, accessing bike storage facilities, and paying for each type of service. Over 30 different operators are coordinated under a single system that allows for smartcard fare payment, coordinated scheduling, and transferring between services. The City has also passed legislation that allows new developers to integrate car-sharing in lieu of meeting the standard parking requirements, thus reducing the overall footprint of parking spaces.

Car sharing in Bremen began in the early 1990’s; however, integration between public transportation and carsharing did not fully come into effect until the late 1990’s and early 2000’s. This required partnerships and coordination between 35 local and regional rail, bus, and tram operators. It also involved work with the local fleet provider, Cambio (car share operator), the municipal government, and the public transportation licencing and funding body and real estate developers. German legislation originally did not allow carsharing vehicles to be parked within the public right-of-way. In the early stages of the program when on-street car sharing stations were not allowed by law, there was also coordination with various organizations to make room for car sharing stations out of the right-of-way.

According to a survey conducted by the City of Bremen, each car-sharing vehicle replaces 11 private vehicles. Bremen’s goal is to reduce the number of privately owned vehicles by 6,000 by 2020.



Figure 4: Carshare station in Bremen

<http://www.citylab.com/commute/2014/12/how-bremen-germany-became-a-car-sharing-paradise/383538/>

① <http://www.citylab.com/commute/2014/12/how-bremen-germany-became-a-car-sharing-paradise/383538/>

① <http://mobilpunkt-bremen.de/>

MULTI-MODAL TRANSIT HUB – GRAND RIVER TRANSIT, REGION OF WATERLOO, ONTARIO, CANADA

<p>Program Description</p>	<p>Introduction of LRT and the subsequent redesign of the transit network in the Region of Waterloo have provided an opportunity to better tie local and intercity travel options together through a central multimodal transit hub (the King/Victoria Transit Hub). Planned features and design elements include:</p> <ul style="list-style-type: none"> • Barrier-free, pedestrian-focused intersection improvements • Pedestrian connection (underpass) to nearby neighbourhood and multi-use trail (MUT) to improve neighbourhood connectivity through rail corridor • Space for a bikeshare station and sheltered bike parking for shorter trips • On-street transfers between bus services, and between bus-LRT to provide fast transfers • Off-street, on-site intercity bus terminal and accessible bus (MobilityPLUS) pick-ups and drop-offs • Rail-Level Passenger Pick Up and Drop Off for GO Transit and VIA Rail above bus terminal • Dedicated carshare spaces • Harmonized customer information (wayfinding) and service amenities (fare kiosks) • 2 public plazas for gathering and rendezvous space, shade and built canopy, as well as opportunities for accessible retail frontage. <p>Zoning for the four-acre site allows for up to approximately 1 million square feet of mixed-use residential, office, and retail (transit-oriented development). The Transit Hub will connect local transit services (ION, GRT,) and intercity services (Greyhound, GO, VIA,) with pedestrians and cyclists in one convenient location. It will also include space for transit amenities as well as offices, stores, condos and apartments. Initial designs have sought to build the hub from the perspective of the pedestrian.</p>
<p>Implementation</p>	<p>The Province of Ontario has committed \$43 million to construct a transit hub at the corner of King and Victoria Streets in downtown Kitchener.</p>
<p>Outcome</p>	<p>N/A</p>
<p>Next Steps</p>	<p>The Region has been working with Infrastructure Ontario and Deloitte to prepare a Provincial Business Case for the Ministry of Transportation, in addition to working with various agencies to identify roles and responsibilities for upgrading rail corridor features.</p> <p>Request for Qualification and Request for Proposals process for a master developer to being in 2017.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • N/A
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • N/A



Figure 5: Region of Waterloo King/Victoria Transit Hub Conceptual Design
<http://www.regionofwaterloo.ca/en/gettingAround/transithub.asp>

4.2.4 Bus Treatments

▷ *Bus lanes, queue jumps, far side stops, in-lane stops, bus only facilities.*

DOUGLAS STREET BUS & BIKE PRIORITY LANES – BC TRANSIT, VICTORIA, BRITISH COLUMBIA, CANADA

Program Description	Transit signal priority and bus/bike priority lanes were implemented on Douglas Street, which connects into downtown Victoria. The goal of the program was to improve transit travel times into the downtown core and operating efficiency to make transit and more attractive travel choice.
Implementation	<p>The project has been implemented over 3 years starting in 2013 when transit signal priority was turned on. Implementation resulted because of local desire to start to develop a rapid transit line to the Westshore, which is a suburban municipality in the Victoria Region.</p> <p>The project involved the City of Victoria Planning and Engineering departments, Ministry of Transportation staff, BC Transit planning and fixed asset construction staff, and extensive consultation with local residents and businesses. Formal agreements were created to provide a grant from BC Transit for the construction. An ongoing maintenance agreement is in development for a contribution to road maintenance and signal maintenance.</p> <p>The first few kilometres of the bus lane were considered a pilot project when announced but they have become permanent</p>
Outcome	The project is considered a success as transit and bike travel times have been improved without having significant impacts to business access along the corridor. Transit travel times have decreased by approximately 1-2 minutes on average; however, further time savings are expected once the entire project is complete. Areas where travel time could be most improved have not yet been completed.
Next Steps	Consideration is being given to extending the bus lanes onto the provincial highway system.
Keys to Success	<ul style="list-style-type: none"> • Education campaign run by partnership between BC Transit, Victoria Police Department, and City of Victoria reminds drivers of regulations about the bus and bike priority lanes
Challenges Faced	<ul style="list-style-type: none"> • Implementation of bus lanes requires a multi jurisdiction coordination and approval process which can be a challenge when organization have multiple priorities to deal with • Local government approvals can be a slow process • The project took longer to implement than expected • Stakeholders asked for road and sidewalk improvements beyond the scope originally envisioned

MESURES PRÉFÉRENTIELLES POUR BUS – SOCIÉTÉ DE TRANSPORT DE LAVAL, LAVAL, QUÉBEC, CANADA

Program Description	The “Mesures préférentielles pour bus” project focused on redefining the streetscape in one of Laval’s industrial sectors. The Société de transport de Laval (STL) worked with the City of Laval to add sidewalks, cycle lanes, reserved bus lanes and transit signal priority for buses to roads that were primarily dedicated to private vehicles. Improvements were required because the sector was attracting many workers, while also receiving through traffic between a residential sector and the Laval central business district.
Implementation	<p>The project was implemented in Fall 2016, after receiving a 100% grant from Québec government. The need for reserved lanes was the main reason to intervene, but also a pretext to integrate many features of Laval Active Mobility Plan.</p> <p>STL had some agreements with the City of Laval and coordinated works with Urbanism and Traffic Engineering. Other civil engineering roadworks were planned on that street and STL was responsible for them too (only one contractor was hired). STL coordinated payment between the City of Laval and the contractor.</p> <p>One pilot was conducted with TSP (7 traffic lights, 4 buses) in 2013 to measure real time savings, calibrate models, and evaluate which intersections in Laval would benefit from TSP.</p>
Outcome	<p>According to STL, it is too soon to measure ridership or modal shift that will result from these improvements. However, time savings for each and every intersection are being measured by calculating how long each bus takes to go through the intersection. Everything is measure in real time, every day, on every bus. TABLEAU is used to manage big data and everything is organized so that the STL can verify if a bus or a traffic light doesn’t work as planned.</p> <p>The project has been challenging to manage, but STL feels that both they and the City of Laval have learned a lot from the experience.</p> <p>Public perception and reaction to the project has been largely positive. In particular, there have been many positive reactions to the integration of active modes.</p>
Next Steps	More corridors are planned on a medium-term period. Further, a Mobility as a Service (MaaS) is now being planned for 2017 that would include taxi, car sharing, ridesharing and transit.
Keys to Success	<ul style="list-style-type: none"> • STL worked very closely with the City of Laval from the beginning • Created a win-win context for both the City and transit operator
Challenges Faced	<ul style="list-style-type: none"> • STL struggled with deciding upon the overall goal of synchronizing the traffic lights. They didn’t know if they wanted to accommodate more vehicles or more people.

RAPIBUS AND AFFILIATED PROJECTS – SOCIÉTÉ DE TRANSPORT DE L'OUTAOUAIS, GATINEAU, QUÉBEC, CANADA

Program Description	<p>The Société de transport de l'Outaouais (STO) recently implemented a new BRT system (Rapibus) in the eastern parts of the city. The corridor is 12km in length and dotted with stations with various amenities, such as bike racks and park-and-rides. It also uses a dedicated bridge to cross the Gatineau river, a major chock point on the road network, and TSP at multiple intersections. The entire endeavour was completed in partnership with the City, which will now focus on the implementation of TODs around the stations. In addition, the transit agency built a cycling lane along most of the corridor.</p> <p>The program forms one step in the STO's overall vision to develop public transit for the next 25 years through the construction of a strong corridor and integration with various modes.</p>
Implementation	<p>The corridor was completed in the Fall of 2013 and was based on 20 years of studies. Partnerships were required with Transports Québec (MTQ), and the City transport & urban planning departments. Formal agreements required to obtain funding.</p>
Outcome	<p>Ridership decreased during the first few months and there was quite a bit of negative press. However, ridership has been increasing over the past 2 years, past the level that were seen before implementation. Smart card taps in the affected sector are checked on a regular basis. However, a complete study, taking into account employment and household data, must be completed to ensure that the program was the cause of increased ridership. The STO also completes an annual survey of customer satisfaction to monitor the success of programs such as this.</p>
Next Steps	<p>STO's plans are to continue to improve the service coverage (span during the day) and service frequency for feeder services. An expansion of the corridor is also in the works. The STO is currently undertaking a study to see where and how to build a similar corridor in other parts of the city. Another IM service being planned is outfitting buses with bike racks to increase the catchment area of the corridor.</p>
Keys to Success	<ul style="list-style-type: none"> • Favouring new connections and destinations over simply providing an improved service to existing customers (and destinations).
Challenges Faced	<ul style="list-style-type: none"> • STO noted that frustration resulted from not focusing the improvements on existing customers. Multiple studies were completed afterwards to learn from mistakes.

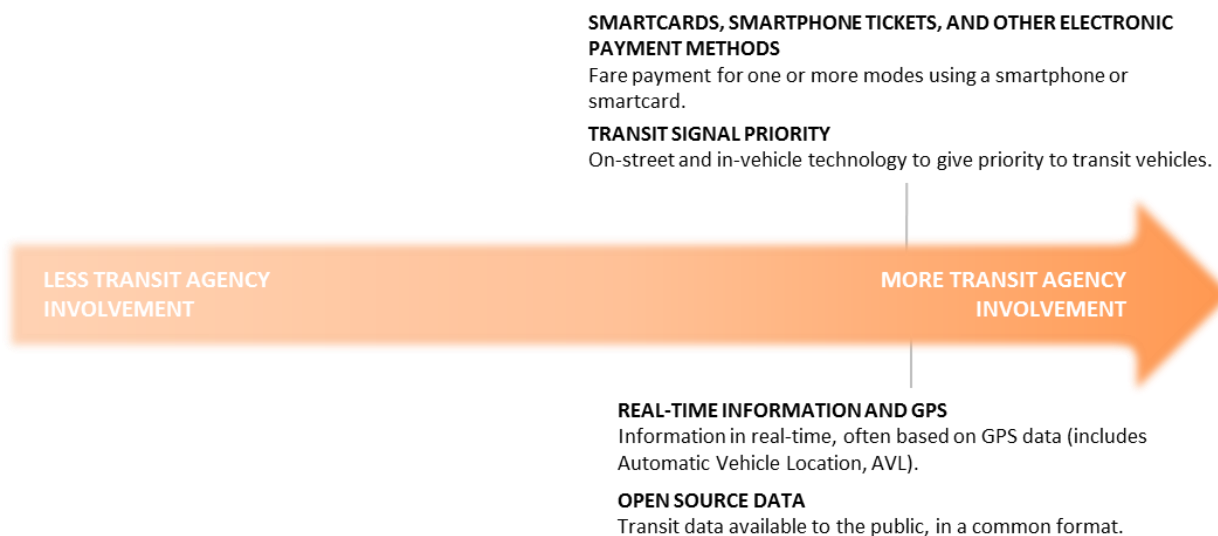
4.3 Intelligent Transportation Systems

The term Intelligent Transportation Systems (ITS) is a broad catch-all description for technology that in some way improves the safety, operation or maintenance of a transportation system, or provides enhanced information to the users of a transportation system. Examples include in-road or video vehicle detection and counting, transit signal priority, freeway traffic management systems with changeable message signs, automated vehicle location systems, real time transit passenger information, closed circuit station and on-vehicle monitoring, and many other systems and technologies.

ITS is a key component of the Design for Movement element of Integrated Mobility because it supports the safe, efficient and effective operation of the infrastructure and modes that people use to travel within a community. While there are numerous solutions under the umbrella of ITS, the following have been selected to provide illustrative examples:

- Smartcards, smartphone tickets, and other electronic payment methods, as has been done with the Transit GO Ticket in King County, Washington, and with the Octopus Card in Hong Kong;
- Transit signal priority, which is used widely across many municipalities (Durham Region is presented herein as an example);
- Real-time information and GPS, which is gradually being adopted by many municipalities and for which projects are currently underway in Winnipeg, Manitoba, Melbourne, Australia, Allegheny County, Pennsylvania, and Seattle, Washington; and
- Open source data, which is provided by a number of municipalities including Columbus, Ohio through SmartColumbus, as well as by the Toronto Transit Commission in Toronto, Ontario.

The following sections outline these examples of ITS approaches to integrated mobility. The graphic below outlines the relative level of transit agency involvement required for each approach.



4.3.1 Smartcards, Smartphone Tickets, and Other Electronic Payment Methods

▷ *Fare payment for one or more modes using a smartphone or smartcard.*

TRANSIT GO TICKET – KING COUNTY METRO TRANSIT, KING COUNTY, WASHINGTON, UNITED STATES

In December 2016 King County Metro announced that customers can now pay for King County Metro, Water Taxi, Seattle Streetcar and Sound Transit Link and Sounder services using their mobile phones. The pilot project is expected to run for six to twelve months. Riders can purchase one or more tickets in advance and activate the ticket when required. They must then show the ticket to the operator when boarding. Transfers can be made to other services within 2 hours of activating the ticket.

① <http://kingcounty.gov/depts/transportation/news/2016/20161201-mobile-ticketing.aspx>

OCTOPUS CARD – HONG KONG

The Octopus Card is a smartcard that was launched in Hong Kong in 1997. At its launch it could be used to pay fare at six participating transit systems. Since then it has been expanded to include over 8,000 service providers, such as:

- Buses, ferries, coaches, railways, tramways, taxis
- Retail (shops, supermarkets, and select restaurants)
- Car parks and on-street parking
- Photocopiers and vending machines
- Leisure facilities
- Access control to commercial and residential buildings
- Hospitals, schools, and public services

Card users earn points over time and can redeem the points for various benefits. The cards can also be set to automatically reload cash once the balance drops below a set value.

In 2014, the Octopus card was also developed as an app to eliminate the need for a physical card. Payments are processed through Near Field Communication (NFC) on enabled devices. According to Acorn Marketing & Research Consultants (International) Limited, approximately 99% of people in Hong Kong between the ages of 15 and 64 have an Octopus card.

① <http://www.octopus.com.hk/get-your-octopus/where-can-i-use-it/en/index.html>

4.3.2 Transit Signal Priority

▷ *On-street and in-vehicle technology to give priority to transit vehicles.*

TRANSIT PRIORITY MEASURES – YORK REGION TRANSIT (YRT)/VIVA, YORK REGION, ONTARIO, CANADA

York Region Transit (YRT) implemented transit priority measures in place before dedicated rapidways were constructed for many Viva routes to assist the on-time performance of Viva services.

The transit signal priority (TSP) system used on Viva routes includes variable priority levels, and is one of the most advanced systems in North America. Viva vehicles are able to “ask” the system for priority when the vehicle is running behind schedule. Vehicles can ask for a low or high level of priority, depending on how late they are running. The system either extends a green light signal or holds a red light signal, depending on the signal cycle.

- ① <https://www.yrt.ca/en/about-us/our-technology.aspx>
- ① <http://www.vivanext.com/blog/tag/transit-priority-measures/>

4.3.3 Real-Time Information and GPS

▶ *Information in real-time, often based on GPS data (includes Automatic Vehicle Location, AVL).*

TRANSITTOOLS – WINNIPEG TRANSIT, WINNIPEG, MANITOBA, CANADA

Winnipeg Transit has been using automatic vehicle location (AVL) technology since 2008. AVL technology is leveraged by Winnipeg Transit through a suite of tools called “TransitTOOLS” that provide Winnipeg Transit customers with a variety of options for obtaining up-to-date scheduling information. These tools include:

- **TeleBUS:** Users can call the TeleBUS number and navigate through the automated system using key prompts to obtain schedule information, such as expected bus arrivals at a particular stop.
- **BUSguide:** BUSguide is a mobile compatible website that can be used to locate stops, plan trips, and receive up-to-date information about upcoming busses.
- **BUStxt:** Users can text the BUStxt number and navigate through the system using text commands to obtain up-to-date scheduling information. The primary commands relate to locating nearby stops, searching for bus departure times, and arrival times at specific locations for a particular bus.
- **BUSwatch:** BUSwatch is a series of almost 100 electronic bus information signs that are located at stops across Winnipeg. They provide estimated arrival times for approaching busses based on AVL data. Arrival estimates are refreshed every minute.
- **BUSgadget:** BUSgadget is a desktop based system that utilizes the AVL data to provide arrival estimates of upcoming busses. The application can be used by the general public or private enterprises to create customized “BUSwatch” signs.
- **QR Codes:** Various bus stops around the City of Winnipeg have QR codes on sign panels. When scanned using a smartphone, the QR codes direct transit customers to a website with up-to-date schedule information for the stop.

① <http://winnipegtransit.com/en/schedules-maps-tools/transittools/>

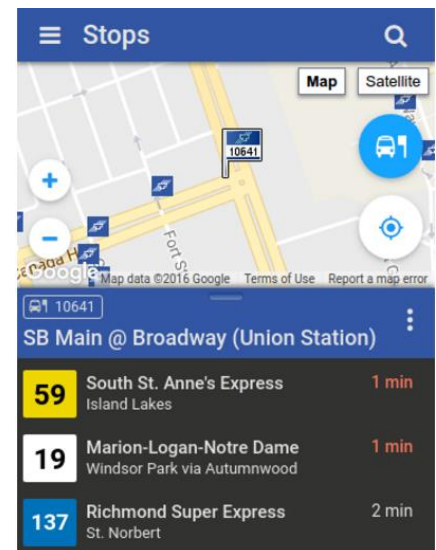


Figure 6: TransitTOOLS Screenshot

<http://winnipegtransit.com/en/schedules-maps-tools/transittools/busguide-beta/>

NATIONAL CONNECTED MULTIMODAL TRANSPORT TEST BED PROJECT – CITY OF MELBOURNE AND UNIVERSITY OF MELBOURNE, MELBOURNE, AUSTRALIA

Set to begin in April 2017, the National Connected Multimodal Transport Test Bed' Project will leverage data from pedestrians, cyclists, and thousands of sensors in vehicles and infrastructure to analyze the movement of active modes, passenger vehicles, public transit, and freight. The test is being conducted in a 1.2 km² area within the City of Melbourne and includes 17 public and private partners. Results from the study will be used to address how to manage traffic from a multi-modal perspective and could help pave the way for connected and automated vehicles.

① <http://360.here.com/2017/01/30/todays-big-cities-need-smarter-transport/>

① <http://www.iotm2mcouncil.org/meltest>

TIRAMISU – PORT AUTHORITY OF ALLEGHENY COUNTY, ALLEGHENY COUNTY, PENNSYLVANIA, UNITED STATES

Tiramisu is a new application developed by Carnegie Mellon University that allows users to get a better indication of how many people are on board Port Authority of Allegheny County buses. Users of the app rate how many people are on board and this information is aggregated and displayed to people waiting to use the bus. They can also input other information, such as breakdowns or service interruptions. The app also uses the built in GPS tracker in phones to provide real-time location info, which can be more accurate than some AVL systems. The purpose of the app is to provide transit users with more accurate information about scheduling and usage.

① <https://dailycrowdsource.com/content/crowdsourcing/613-crowdsourcing-takes-the-edge-off-public-transportation>

PARKING AVAILABILITY PILOT – SOUND TRANSIT, SEATTLE, WASHINGTON, UNITED STATES

Sound Transit recently ended a real-time parking availability pilot that informed prospective customers of the availability of parking at Auburn Station and Federal Way Transit Center. The program monitored the number of vehicles entering and exiting the parking lot to estimate total usage. This information was made available to the public on a dedicated webpage. Sound Transit is currently reviewing the results of the pilot to determine if the program should be continued and/or expanded.

① <http://www.soundtransit.org/Real-time-parking-pilot-program>

4.3.4 Open Source Data

▷ *Transit data available to the public, in a common format.*

SMART CITIES APPLICATION (SMARTCOLUMBUS) – COLUMBUS, OHIO, UNITED STATES

The City of Columbus recently won the Smart Cities Challenge, which looked at innovative plans to develop smart cities across the US. Through this challenge and an additional grant, Columbus has \$50 million in funding to implement their plan.

A core component of Columbus' plan was the development of an integrated data exchange. The data exchange would provide an open source data base that could be used by private app developers, public agencies, the public sector, and the private sector. Sources of data that would feed into the data exchange include non-transportation sources such as United Way and the City of Columbus Department of Health, transportation sources such as the Ohio DOT and transport networking companies, and Smart City Project sources such as dedicated short range communication, electric vehicle charging stations, and RFID vehicle sensors. The availability and ease of access of this open data promote collaboration and innovation between government and non-governmental groups, giving app developers and potential new mobility actors the data they need to develop new mobility solutions that support the planning and mobility goals of the community.

① <https://www.columbus.gov/smartcolumbus/>

AUTOMATIC VEHICLE LOCATION INFORMATION – TORONTO, ONTARIO, CANADA

The Toronto Transit Commission (TTC), like many transit agencies, makes public information regarding the locations of each bus on each route, in real-time. This information is accessible by a number of mobility applications which assist users in planning when they need to arrive at the bus stop.

A local café has begun streaming this information using a mobility application, to provide customers with a better sense of how long they can rest in the café before the streetcar arrives. This is a particularly interesting example of two actors in commuters' daily lives – the café and the transit agency – working together to improve the travel experience.

① https://www.thestar.com/news/city_hall/2010/11/30/ttc_info_a_perk_for_riders_at_coffee_shop.html

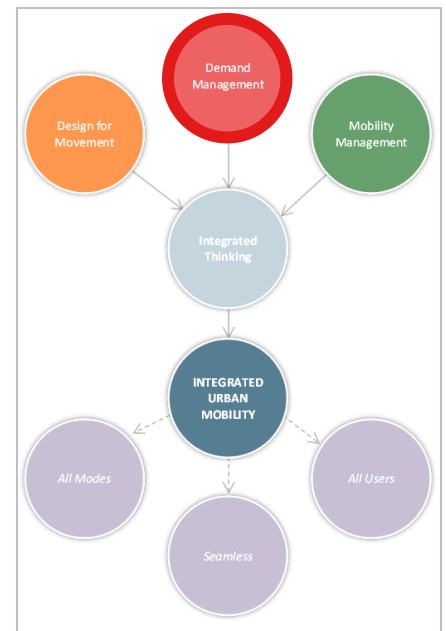


5.0 Demand Management

All segments of a population that need to move about in a community represent the mobility demand, and understanding and influencing this is called Demand Management. Put another way, Demand Management is the use of policies, programs, services and products to influence whether, why, when, where and how people travel by encouraging them to shift modes (walk, cycle, take transit, or rideshare instead of drive), make fewer trips (telework, telephone, shop online), or travel more efficiently (shop locally, do several things on each trip, avoid peak periods or congested routes).

Demand Management is also about understanding the needs of each and every user. This means learning about why people are traveling and developing services, offers and incentives that meet their individual lifestyle needs. In other words, focusing on the user.

Demand Management approaches typically use education, promotion and/or outreach techniques to provide information and training to the community in order to encourage them to make more sustainable urban transportation choices. Incentives or disincentives such as transit fare discounts or parking space charges can also be used to influence demand.



Example initiatives and programs for Demand Management described in this toolbox are:

**Pricing Policies
& Incentives**

- Parking Prices
- Fare Free
- Rewards/Points Programs
- Discounted Passes for Seniors
- U-Pass Agreements
- Dynamic Fare Pricing

Smart Travel Programs

- Full Programs
- Employer Incentives for Transit Use

Education/Outreach

- Outreach
- Travel Training Programs
- Mobility Research and Advocacy Groups

5.1 Pricing Policies & Incentives

Fare strategies are used to shift travel demand away from peak periods or make public transit a viable mode choice for a broader range of users. Dynamic fare pricing can be based on a number of factors. For example, transit fares are discounted during smog alerts in Laval, Quebec, and transit fares in the Greater Toronto and Hamilton Area (GTHA), Ontario and Vancouver, British Columbia, are based on a zonal system.

Fare strategies can also be used to encourage increased transit usage through the use of discounts or incentives, such as:

- Adjusting parking pricing, as has been done in Kelowna, British Columbia, and Kingston, Ontario;
- Reduced fares for seniors, as offered in Mississauga, Ontario; and
- Rewards/points programs, such as the Merci Program (Montreal, Quebec), M-Card (St. John's, Newfoundland), and I Amsterdam City Card (Amsterdam, Netherlands).

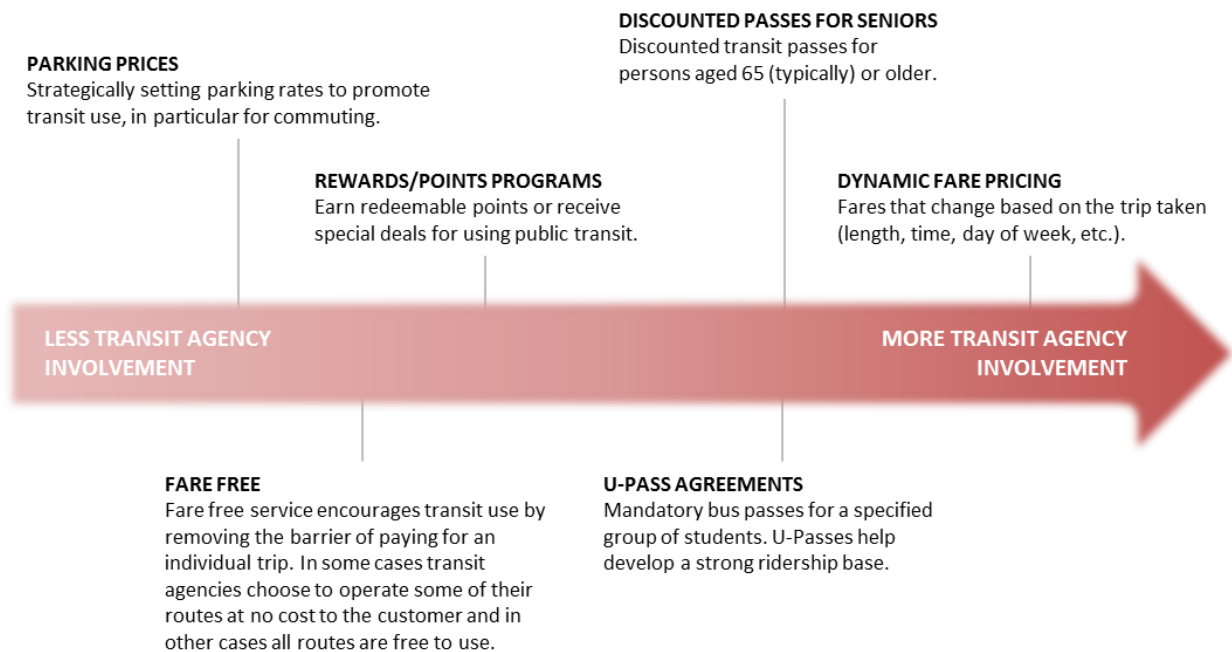
Some transit agencies have partnered with universities to provide “U-Passes” to students, and sometimes to university staff/faculty as well. Two examples are discussed herein – the University of Fraser Valley in British Columbia, and Brock University in Ontario.

A small group of municipalities worldwide have chosen to provide free transit service. These include select services in Winnipeg, Manitoba.

The increasingly common use of smart cards and the emerging use of mobile technology for fare payment are providing greater flexibility and new ways to manage demand and create fare/price based incentives. In concert with this is the increasing availability of data about trips and the people that make them, and this requires insight and effort to learn from, and secure the new information.

It is important to note the link between fare policies (many examples of which are mentioned above) and social programs, as social programs often have mobility implications. For example, a social program targeted at reducing fares for low-income citizens may result in increased ridership. These types of social programs will not be discussed in this toolbox.

The sections below highlight some examples of the many different fare strategies. The graphic below illustrates the spectrum of transit agency involvement of each type of fare strategy. Please note that strategies related to “fare free” service or discounted transit passes for particular user groups are often implemented to promote social equity and may not be an appropriate strategy for supporting integrated mobility in some jurisdictions.



5.1.1 Parking Prices

▷ *Strategically setting parking rates to promote transit use, in particular for commuting.*

PARKING MANAGEMENT STRATEGY – KELOWNA, BRITISH COLUMBIA, CANADA

According to Guiding Principle #5 of the City of Kelowna Parking Management Strategy, “parking will be used to support a balanced transportation system”. This principle further states that use of single occupancy vehicles will be discouraged by limiting the available parking and strategically setting parking prices. Based on a resolution passed by Council in 2001, parking rates in Kelowna are priced to be a minimum of 10% greater than a monthly transit pass in high demand areas and 80% of the cost of a transit pass in low demand areas.

In September 2015 Council approved increases in transit rates, which triggered an increase in parking rates. The monthly parking rate in high demand areas was increased from \$66.00 to \$77.00, making it \$7.00 more than a monthly transit pass. Additionally, the daily parking rate was increased from \$5.00 to \$6.00, setting it at \$1.00 more than the cost of two transit fares.

- ① <https://www.kelowna.ca/roads-transportation/parking/parking-management-strategy/guiding-principles>
- ① https://www.kelowna.ca/sites/files/1/docs/roads-transportation/2015-11-16_report_to_council_-_parking_rate_fine_and_fee_adjustments.pdf

TRANSIT AND PARKING RATE REVIEW – KINGSTON, ONTARIO, CANADA

In 2013, the City of Kingston proposed linking monthly parking prices to the price of a Kingston Transit monthly pass. The proposal was based on several guiding principles that were derived from a study of best practices. In particular, these principles stated that “continuing to price monthly parking at a lower rate than a monthly transit pass would be unsound and will affect our ability to support the investment in Transit, and achieve our modal shift objectives.” The proposed rates for parking were based on the desirability of the spaces, with the least desirable spaces (Category 1) set to a minimum of 10% more than a monthly transit pass and Category 2 to 4 spaces set to 15%, 20%, and 25% higher than the cost of a Category 1 space, respectively.

- ① <https://www.cityofkingston.ca/documents/10180/255592/Transit+&+Parking+Rate+Review+Report/cd2eb71a-4e9d-40e8-9cce-5feff05d1dc6>

5.1.2 Fare Free

- ▷ *Fare free service encourages transit use by removing the barrier of paying for an individual trip. In some cases transit agencies choose to operate some of their routes at no cost to the customer and in other cases all routes are free to use.*

DOWNTOWN SPIRIT – WINNIPEG TRANSIT, WINNIPEG, MANITOBA, CANADA

Winnipeg Transit operates three free to board routes branded as the “Downtown Spirit” that run through several neighbourhoods in downtown Winnipeg. The Downtown Spirit serves as a connector between shopping centres, entertainment establishments, museums and heritage sites, and a plethora of restaurants in the downtown core. According to the current schedule, two of the routes run Monday to Friday between 11:00am and 4:00pm at approximately 17 minute headways, Saturday between 11:00am and 6:00pm at approximately 17 minute headways, and Sundays and holidays between 12:00pm and 6:00pm at approximately 21 minute headways. The third route operates on 34 minute headways, Monday to Friday between 7:00am and 7:00pm and Saturday between 11:00am and 7:00pm.



Figure 7: Winnipeg Transit Downtown Spirit Bus
<http://winnipegtransit.com/en/service/downtownspirit/>

① <http://winnipegtransit.com/en/service/downtownspirit/>

5.1.3 Rewards/Points Programs

▶ *Earn redeemable points or receive special deals for using public transit.*

MERCI PROGRAM – SOCIÉTÉ DE TRANSPORT DE MONTRÉAL, MONTRÉAL, QUÉBEC, CANADA

STM Merci, which was launched as a pilot program in 2013, gives deals to STM customers on local events, establishments, and services. Example promotions include discounted admission prices, free one-way fares to or from an event, and discounts on car rental and carshare programs. The program originally required STM users to have an iPhone app, but this requirement has since been removed. More recent partnerships require STM customers to use promo codes, show their OPUS cards, or provide proof of a valid STM fare to receive their discount.

- ① <http://www.stm.info/en/offers-and-outings/benefits/exclusive-offers>
- ① <http://www.stm.info/en/press/press-releases/2013/the-stm-launches-a-one-of-a-kind-application-to-thank-its-clients>

M-CARD – METROBUS, ST. JOHN'S, NEWFOUNDLAND & LABRADOR, CANADA

In 2006, the St. John's Transportation Commission launched the m-card program, which allowed users to pay for fares using a smartcard while simultaneously accruing "m-points" for using Metrobus services. The "m-points" could be used to get deals at local establishments. Since then the program has been changed to an AIR MILES® Reward Program. According to the current offer, m-Card users can "earn one AIR MILE® reward mile for every two on-board electronic validations during the offer period, excluding transfers, to a maximum of ten on-board electronic validations per Collector Account per day". m-Cards can be purchased for \$5.00 from participating establishments and can be loaded with various fare types (i.e. cash, tickets, passes) at Metrobus machines, at sales outlets, or online.

- ① http://cutaactu.ca/sites/default/files/3.4customize_fares.pdf
- https://www.metrobus.com/mcard/index_main.asp

I AMSTERDAM CITY CARD – AMSTERDAM, NETHERLANDS

The "I Amsterdam City Card" is aimed at tourists and provides unlimited access to Gemeentelijk Vervoerbedrijf (GVB) public transit services and tailored deals at other local establishments for a specified period of time. The passes can be bought in 24 hour increments up to 96 hours. Promotions related to over 130 local amenities are included with card, such as free giveaways and discounts at local restaurants and services, and free entry to various museums, heritage sites, galleries, gardens, and the Artis Royal Zoo.

- ① <http://www.iamsterdam.com/en/i-am/i-amsterdam-city-card>

5.1.4 Discounted Passes for Seniors

- ▷ *Discounted transit passes for persons aged 65 (typically) or older.*

OFF-PEAK SENIORS \$1 FARE PILOT PROGRAM – MiWay (MISSISSAUGA TRANSIT), MISSISSAUGA, ONTARIO, CANADA

MiWay is currently piloting a seniors' \$1 fare program. The offer is only valid during off-peak times, which include weekends, holidays, and weekdays from 9:30am to 3:30pm and after 7:00pm. Only persons aged 65 or older are eligible for the program and must present the operator with valid ID upon boarding. The pilot started in June 2015 and is set to end in June 2017.

① <http://miwayblog.ca/2016/01/senior-1-cash-fare-pilot-extended/>

5.1.5 U-Pass Agreements

- ▷ *Mandatory bus passes for a specified group of students. U-Passes help develop a strong ridership base.*

U-PASS AGREEMENT – UNIVERSITY OF FRASER VALLEY, BRITISH COLUMBIA, CANADA

BC Transit, in conjunction with Central Fraser Valley Transit System (Abbotsford) and Chilliwack Transit, have a U-Pass agreement with the Student Union Society of the University of Fraser Valley (SUS). Initiated in 2009, the U-Pass gives University of Fraser Valley students:

- unlimited access to transit services provided by Central Fraser Valley Transit System and Chilliwack Transit;
- free admission to several local recreation and leisure centres; and
- discounts at over 30 local restaurants and stores.

The current cost of the U-Pass is \$43.13 per four-month semester (i.e. Fall, Winter, and Summer). A portion of this fee goes to the students' union for administering the program and a portion goes to the recreation centres. Students may opt out of the program if they are not enrolled in any courses that require them to be on campus or if they have a disability that prevents them from using conventional and paratransit services.

U-Pass holders represent approximately 6% of Chilliwack Transit's total ridership and 24% of Central Fraser Valley Transit System's total ridership.

① <http://www.ufvsus.ca/upass.html>

U-PASS AGREEMENT – BROCK UNIVERSITY, ONTARIO, CANADA

St. Catharines Transit and the Brock University Students' Union (BUSU) have had a U-Pass agreement in place since 2003. Originally the U-Pass fee charged by St. Catharines Transit was structured on a 'per student' basis, but it has since changed to a 'per service hour' charge. Eight routes under the current agreement are funded exclusively by BUSU at full cost recovery.

BUSU charges each student taking at least 1.5 credits a mandatory fee of \$202.22. This fee includes cost incurred from its U-Pass agreements with St. Catharines Transit, Welland Transit, and Niagara Falls Transit. The U-Pass is valid between September and April each year. Students may purchase a separate monthly pass during the summer. U-Pass riders from Brock University and Niagara College represent approximately 55% of St. Catharines Transit's total ridership.

① <http://www.brockbusu.ca/government/finances/fees/>

5.1.6 Dynamic Fare Pricing

▷ *Fares that change based on the trip taken (length, time, day of week, etc.).*

SMOG ALERT PRICING – SOCIÉTÉ DE TRANSPORT DE LAVAL, LAVAL, QUÉBEC, CANADA

Between June 1 and Labour Day the Société de transport de Laval (STL) offers a reduced fare of \$1 on all bus trips made the day after Environment Canada issues a smog alert. The \$1 represents a 60% discount from the regular \$3.25 fare and must be paid in cash. Smog alert pricing does not apply to paratransit services. This initiative started in 2008 and is intended to help reduce smog generated by private automobiles.

① <http://www.stl.laval.qc.ca/en/about-the-stl/smog-alert/>

① http://www.stl.laval.qc.ca/userfiles/files/pdf/en/nouvelles/Smog_Alert_EN.pdf

ZONE FARE SYSTEM – TRANS LINK, VANCOUVER, BRITISH COLUMBIA, CANADA

TransLink utilizes a three-zone fare payment system. The fare zones radiate from the downtown core. All bus travel is priced as a one zone fare; however, SeaBus and SkyTrain prices change based on how many zones of travel are entered on a trip. Trips that begin and end within one zone (i.e. “one zone trips”) cost \$2.75, two zone trips cost \$4.00, and three zone trips cost \$5.50. Reduced rate fares are available for children aged 5-18, seniors (65+) or HandyCard holders. All fares are reduced to the one zone fare price during off-peak times, which includes after 6:30pm on weekdays and all day Saturday, Sunday, and holidays.

- ① <http://www.translink.ca/en/Fares-and-Passes/Single-Fares.aspx>
- ① <http://www.translink.ca/en/Fares-and-Passes/Paying-Your-Fare.aspx>



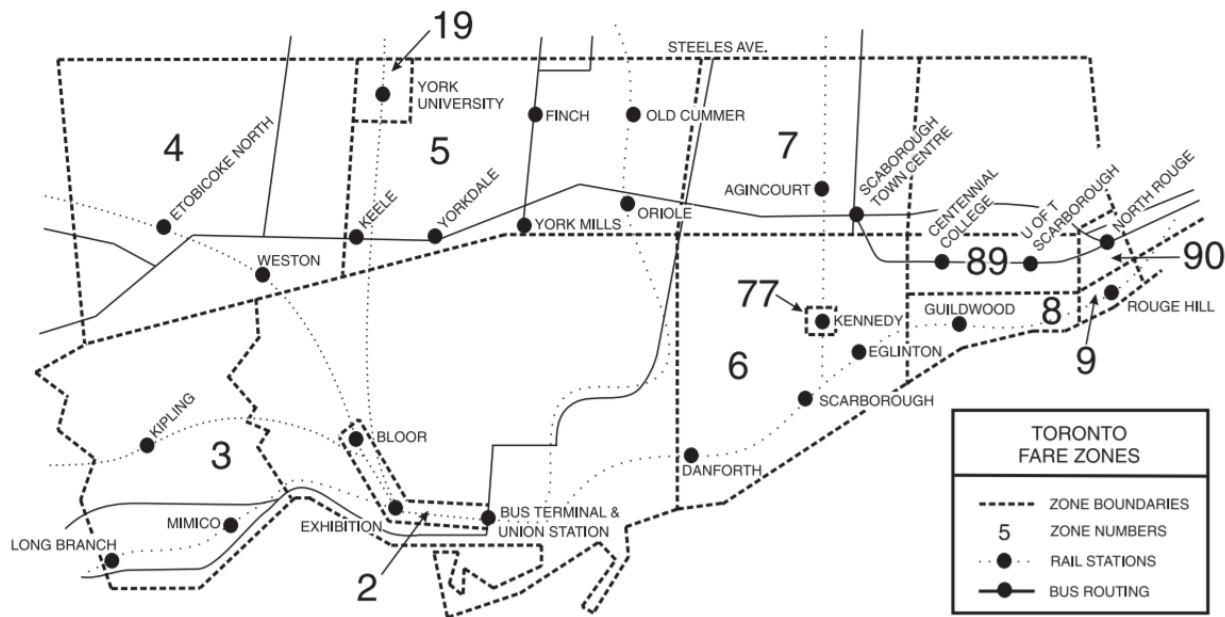
Figure 8: Translink Fare Zone Map

<http://www.translink.ca/en/Fares-and-Passes/Fare-Zone-Map.aspx>

ZONE FARE SYSTEM – GO TRANSIT, GREATER TORONTO AND HAMILTON AREA (GTHA), ONTARIO, CANADA

The GO Transit fare system is based on a series of fare zones and fare corridors. Fare zones are geographic areas and fare corridors are rail lines and bus routes that pass through multiple fare zones. There are currently 88* different fare zones, 12 of which are located within the City of Toronto, and 14 fare corridors. GO Transit fares are calculated based on the origin zone and destination zone along a fare corridor, and are roughly linked to the distance of travel. All fare corridors except for Highway 407 pass through the Toronto fare zone (i.e. Zone 2). In general, separate tickets are required for trips on multiple fare corridors; however, there are some exceptions. Due to the complexity of this fare system, GO Transit has a fare calculator that can be used to determine the fare between two stops for various pass types (i.e. single pass, day pass, group pass, or PRESTO) and demographic groups (i.e. adult, student, child, senior, or group).

- ① http://www.gotransit.com/public/en/docs/Tariff_EN.pdf
- ① https://en.wikipedia.org/wiki/GO_Transit_fares
- ① <http://www.gotransit.com/publicroot/en/fares/farecalculator.aspx>



- X. A ticket for travel beyond Toronto is valid from all points in Toronto Fare Zones where the fare value is equal to or less than the fare value to or from the Toronto Fare Zone shown on the ticket. (Examples, a ticket from Zone 3 to Zone 33 is valid from Zone 5 to Zone 33. A ticket from Zone 13 to Zone 91 is valid from Zone 2 to Zone 91.)

Figure 9: GO Transit Fare Zones

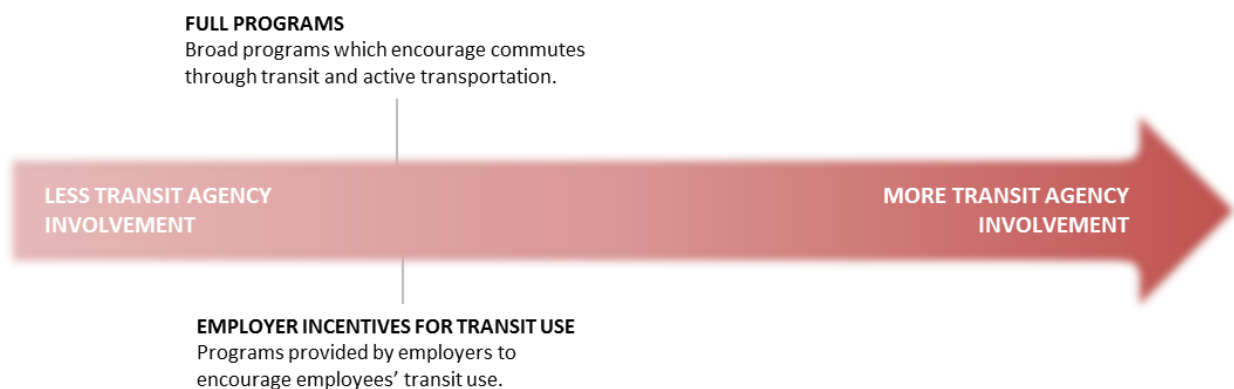
http://www.gotransit.com/public/en/docs/Tariff_EN.pdf

5.2 Smart Travel Programs

Smart Travel Programs are often run by public agencies or by non-profit groups under contract to public agencies. The programs typically bring together a variety of services such as education and outreach, carpool matching, guaranteed ride home, and transit incentives for the broad community or an area of a community such as a campus or large area of employers. The purpose of the program is usually to encourage and increase the use of sustainable transportation modes and reduce the use of single occupant vehicles.

Smart travel programs are generally either full programs, involving all citizens, or employer-based programs, which often involve employer-provided incentives for transit use (such as the EcoPass in Winnipeg, Manitoba). Full smart travel programs are generally more comprehensive and involve many elements. Examples of such programs are the Smart Commute Program (Mississauga, Ontario), SmartTrip Program (Halifax, Nova Scotia), and the TravelWise Transportation Management Association (Region of Waterloo, Ontario).

Examples of several different smart travel programs are outlined in the following sections. As the graphic below shows, there is relatively little transit agency involvement required.



5.2.1 Full Programs

▷ *Broad programs which encourage commutes through transit and active transportation.*

SMART COMMUTE PROGRAM – MIWAY (MISSISSAUGA TRANSIT), MISSISSAUGA, ONTARIO, CANADA

MiWay is working with Smart Commute to promote non-auto travel modes in Mississauga. There are several programs offered by Smart Commute, including the Smart Commute Trip Planning tool, Emergency Ride Home Program, Active Switch Program (promotes active transportation), and the Workplace Program. Through the Workplace Program, employers are provided with baseline commuter surveys, site assessments, customized employee commuting work plans, workshops, and promotional campaigns and incentives.

Smart Commute Programs were implemented in Mississauga in 2006 and 2007. The goal of the program is to reduce traffic congestion and to take action on climate change by encouraging the use of sustainable modes of transportation. Partners and stakeholders for the program include Transit marketing, the City of Mississauga TDM team, and the Region of Peel TDM team.

MiWay is continuing to work with City of Mississauga staff to find out ways of supporting a variety of mobility options, including transit.

SMARTTRIP PROGRAM – HALIFAX TRANSIT, HALIFAX, NOVA SCOTIA, CANADA

Program Description	As part of the implementation of the Transportation Demand Management functional plan, the SmartTrip program provides education, incentives, and information to Halifax employers to help promote transit, cycling, carpooling, walking, and tele-work options to its employees. The largest and most popular part of SmartTrip is the EPass program which is a reduced-cost annual transit pass, administered by employers participating in the SmartTrip Program. When SmartTrip was introduced in 2011, its primary objective was to increase transit ridership through the EPass program. EPasses are paid through payroll deductions.
Implementation	<p>The SmartTrip program was implemented in 2011. The EPass pilot program was launched in 2012/2013 fiscal year. SmartTrip was introduced to:</p> <ul style="list-style-type: none"> • reduce traffic congestion into the Halifax peninsula during peak hours • reduce environmental impact from greenhouse gas emissions • reduce need for road network capacity projects <p>Municipal departments included Planning and Development (through both the IMP and TDM programs), Halifax Transit, and Finance. Stakeholders included local employers. Formal agreements required with SmartTrip Partners include:</p> <ul style="list-style-type: none"> • One-year SmartTrip membership (yearly fees applies – currently under review) • One-year EPass program contract. If a change in employment occurs, EPasses must be returned to the onsite coordinator or the employer will continue to be charged.
Outcome	<p>Since its inception, membership to the SmartTrip program increases each year. With each new member, there is an enrolment increase in the EPass program with up to 20-50 new individual enrolments. New members are both new and current transit users.</p> <p>SmartTrip currently has 14 members (employers) and over 930 EPasses issued for 2017. An online yearly survey is conducted with EPass holders and employers to obtain feedback on program rollout, travel patterns prior to enrolment, travel patterns since enrolment, and ease of use, among others. Stakeholders have expressed satisfaction to be able to offer a discounted employee transit pass to its employees. It is a useful recruiting and retention tool and alleviates parking demands.</p>
Next Steps	<p>Next steps for the program include:</p> <ul style="list-style-type: none"> • Increase SmartTrip membership by 2 members (200-400 employees) • Increase EPass enrolments (specifically single-occupancy vehicle commuters) • Expand SmartTrip program offerings • On-going social marketing and communications <p>Currently Halifax Transit and the Halifax Planning & Development department are developing an Integrated Mobility Plan which has the overarching target of reducing single occupancy vehicles on the road. It is anticipated that some of the recommendations which will emerge from the report will include expansions or refinements of the Smart Trip and EPass programs.</p> <p>A lesson learned from the program is that employers should be able to offer the EPass program to new employers at a minimum twice a year. Employees feel disadvantaged having to wait to participate.</p>
Keys to Success	<ul style="list-style-type: none"> • Ease of program implementation • Employee retention and recruiting tool • Environmental stewardship • Parking-demand management
Challenges Faced	<ul style="list-style-type: none"> • With a growth of over 150 enrolments in 2016, the sign-up period has increased exponentially, making it more work for limited staff. • Yearly membership fee structure to participate in the SmartTrip Program is challenging. The membership fee was cost prohibitive for some large employers, particularly government employers. • At present there is only one enrolment period per year for the annual transit pass. This has meant that new employees are unable to enrol in the EPass program until the following year. • SmartCard technology unavailable.

TRAVELWISE TRANSPORTATION MANAGEMENT ASSOCIATION – GRAND RIVER TRANSIT, REGION OF WATERLOO, ONTARIO, CANADA

Program Description	<p>TravelWise Transportation Management Association (TMA) is a public-private partnership where participating organizations pay a membership fee to the Region in exchange for access to transportation demand management (TDM) services and tools. In exchange for annual membership fees, TravelWise members' employees gain access to online carpool matching and trip logging software, discounted GRT Corporate Passes, and an Emergency Ride Home Reimbursement service as incentives/supports for sustainable commuters.</p> <p>Member organizations also receive a suite of "Member Services". Member Services include annual reports on employee travel behaviours, employer recognition, annual on-site events to promote TravelWise services, and access to the member Working Group that shares information, resources, and local examples about how to implement successful employer-led TDM programs.</p> <p>TravelWise promotes mode choice over an adoption of particular behaviors. The TMA carries out branded promotional campaigns to targeted workplaces as well as broader community-based initiatives to shift norm appeals regarding integrated mobility. The goal of the program is to reduce single-occupancy vehicle use by promoting mode choice for commuters (including multi-modal travel solutions).</p>
Implementation	<p>The program was implemented in 2012 and was a direct result of the Commuter Challenge. Initial partnerships included various Departments at the Region of Waterloo, area municipalities, technology companies, consulting companies, University and higher education institutes, and insurance companies. Additional partnerships have since been made with workplaces in the transportation, developer, energy, community service, and telecommunications sectors.</p> <p>A Program Services Agreement was required to implement the program. It outlines the scope services provided to participating organizations in exchange for membership fee, as well as expectations of member organizations (e.g., provide workplace point of contact). The program also required a Collaborative Agreement so that the Region of Waterloo can contract frontline member/employee services to a local not-for-profit. This agreement outlines the roles, expectations, and work plan for the not-for profit.</p> <p>Prior to TravelWise, workplaces in the community could enrol in a payroll deduction program for transit passes. Individual employees can now access Grand River Transit's Discounted Corporate Transit Pass program and purchase a pass at a discounted rate, but this requires their workplace to participate in TravelWise. TravelWise was piloted in 2012 with a limited number of participating workplaces.</p>
Outcome	<p>The Region of Waterloo measures success in terms of membership growth, employee uptake, and annual employee travel behaviour surveys. Since 2012 the program has grown from 13 to 26 organizations. Further, over the past two years there has been a 15.8% increase in transit pass sales, 77.1% increase in web portal users, 39,691 sustainable trips logged, and 249 carpool requests connected. With that said, the travel surveys have indicated that the primary mode split remains relatively unchanged (71% single occupancy vehicles). This has resulted in the TMA setting a new target of 5% reduction in SOV commuting by 2020.</p> <p>Member organizations have generally been supportive and engaged in the program. However, members join for a variety of reasons. For example, a member who joins TravelWise as part of their organization's aggressive corporate sustainability strategy may be more engaged (e.g., setting an ambitious sustainable commute target for their employees) than an organization that joined to access the core services in an effort to manage parking supply issues.</p>
Next Steps	<p>One of the next steps of the program is to target membership outreach to workplaces along major transit corridors (LRT, express routes). Other proposed improvements include:</p> <ul style="list-style-type: none"> • Expanding the TravelWise brand and select services (promotions/ride matching) into school-based settings (with full services for school employees). • Expanding the TravelWise brand and services to selected high-density residential developments through a pilot. • Exploring enhanced partnerships with local carshare, bikeshare organizations to offer additional mobility services to participating TravelWise members.
Keys to Success	<ul style="list-style-type: none"> • Flexibility in motivation for membership – as described above the program is appealing because of its broad applicability (e.g., program can be seen as "quick win" for enhancing a corporate sustainability strategy or workplace health program, yet annual employee report provides opportunity to enhance programming and workplace commitment to sustainable transportation strategies. Core services are also viewed as an employee recruitment/retention package and/or solutions to rapid growth) • Consistent branding and messaging for program promotion, but understand how to "sell" the program based on a workplaces specific goals. Consistent, frequent, messaging to employees (through well positioned workplace contacts) is essential for demonstrating workplace support and commitment to alternative modes of transportation. Employers located within transit corridors see the cost-benefit potential of the program early and often champion the program.
Challenges Faced	<ul style="list-style-type: none"> • Ensuring all employees are aware of the program and its services. TravelWise works through workplace "champions" (points of contact). These champions need to be well positioned to reach out to all employees to promote the services that support multi-modal transportation.

5.2.2 Employer Incentives for Transit Use

▷ *Programs provided by employers to encourage employees' transit use.*

ECOPASS – WINNIPEG TRANSIT, WINNIPEG, MANITOBA, CANADA

Program Description	EcoPass is a discounted monthly bus pass offered to employees at participating employers. The employer decides on the amount of discount to offer (from 5% to 100%). Winnipeg Transit rebates a portion of this discount back to the employer and the employee pays the balance. The employee receives the full discount on the pass, with the employer and transit sharing the funding of the discount.
Implementation	The EcoPass was implemented in the early 2000's. The program has been maintained during the recent rollout of the Peggo automated fare collection system.
Outcome	The program has been popular with employers and employees. The program offers employers an attractive and less expensive alternative to the provision of on-site and/or subsidized parking. It is viewed as an important benefit in attracting and retaining employees. For employees, the passes are paid through payroll deductions, eliminating the need to renew each month. The program provides Winnipeg Transit with committed users throughout the year. Approximately 30% of all adult monthly passes in Winnipeg are sold through the EcoPass program.
Next Steps	The EcoPass program is mature and has worked well for many years. Winnipeg Transit markets the program to new employers on an ongoing basis.
Keys to Success	<ul style="list-style-type: none"> • Proactive marketing with employers • Sharing the discount between employer and transit
Challenges Faced	<ul style="list-style-type: none"> • Integrating the program with Peggo, Winnipeg Transit's automated fare collection system.

5.3 Education/Outreach

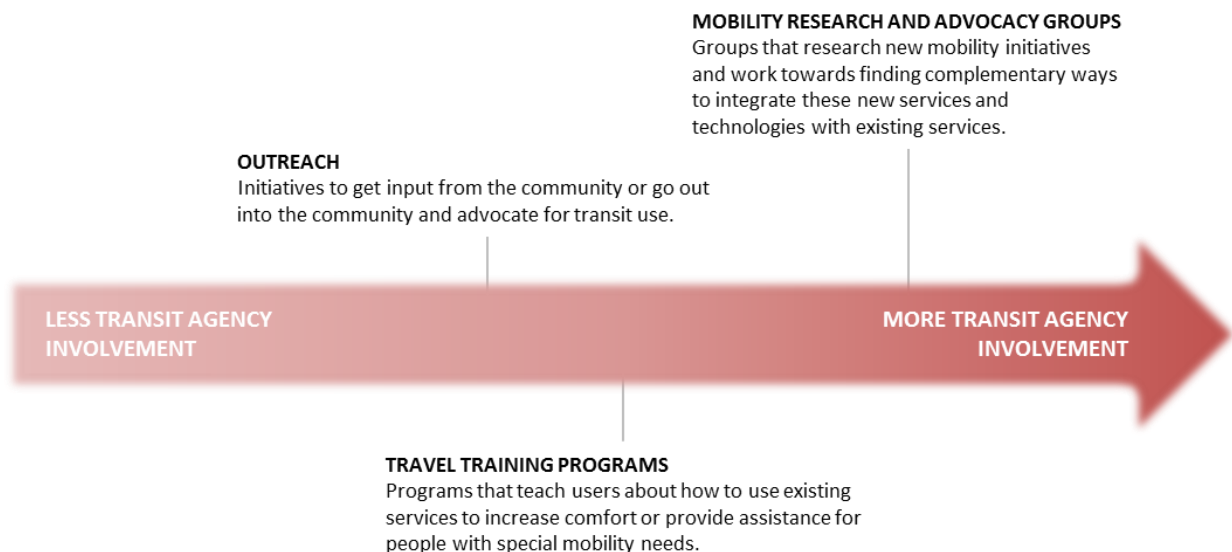
A key element of demand management initiatives is informing people about the benefits and impacts of the various transportation choices they make. This can take many forms.

General outreach efforts provide information to the community about the personal and societal costs and benefits of different mode choices, and demonstrate to each individual how making certain choices will add value to their daily lives. Examples of such outreach efforts include ORCA to Go (King County, Washington), and the Capital Bikeshare Crowdsourcing Map (United States).

Travel training programs teach people how to use modes they may not be accustomed to. Such programs are offered by York Region Transit/VIVA in York Region, Ontario, and the Réseau de transport de Longueuil (RTL) in Longueuil, Quebec.

Mobility research and advocacy groups push the envelope on new mobility initiatives to further the level of integration between services and technologies, through research and development. La maison de temps et de la mobilité in Belfort, France, the Mobility Innovation Lab in Vancouver, British Columbia, and l'Agence des temps in Poitiers, France, are all examples of mobility research and advocacy groups.

The sections following outline several examples of education and outreach efforts. The graphic below outlines the relative level of transit agency involvement required for each.



5.3.1 Outreach

- ▶ *Initiatives to get input from the community or go out into the community and advocate for transit use.*

ORCA TO GO – KING COUNTY METRO TRANSIT, KING COUNTY, WASHINGTON, UNITED STATES

King County Metro regularly travels to senior centres, community centres, and major events to provide mobile sales and assistance. This program is particularly help to customers that have trouble purchasing transit tickets or have mobility impairments that make it difficult to go to regular sales outlets.

① <http://kingcounty.gov/depts/transportation/metro/fares-orca/orca-cards/to-go.aspx>

CAPITAL BIKESHARE CROWDSOURCING MAP – UNITED STATES

Capital Bike Share utilizes a website to get input from the public as to where new bike sharing stations should be implemented. All proposed and existing station locations are displayed on an interactive map. The map also has different bike facilities shown and pending/approved stations that have not yet been constructed. Users can login and provide suggestions for new locations or support locations proposed by others. The site also allows people to provide written comments as to why they like or don't like a proposed location.

① <http://www.bikearlington.com/pages/bikesharing/capital-bikeshare-crowdsourcing-map/>

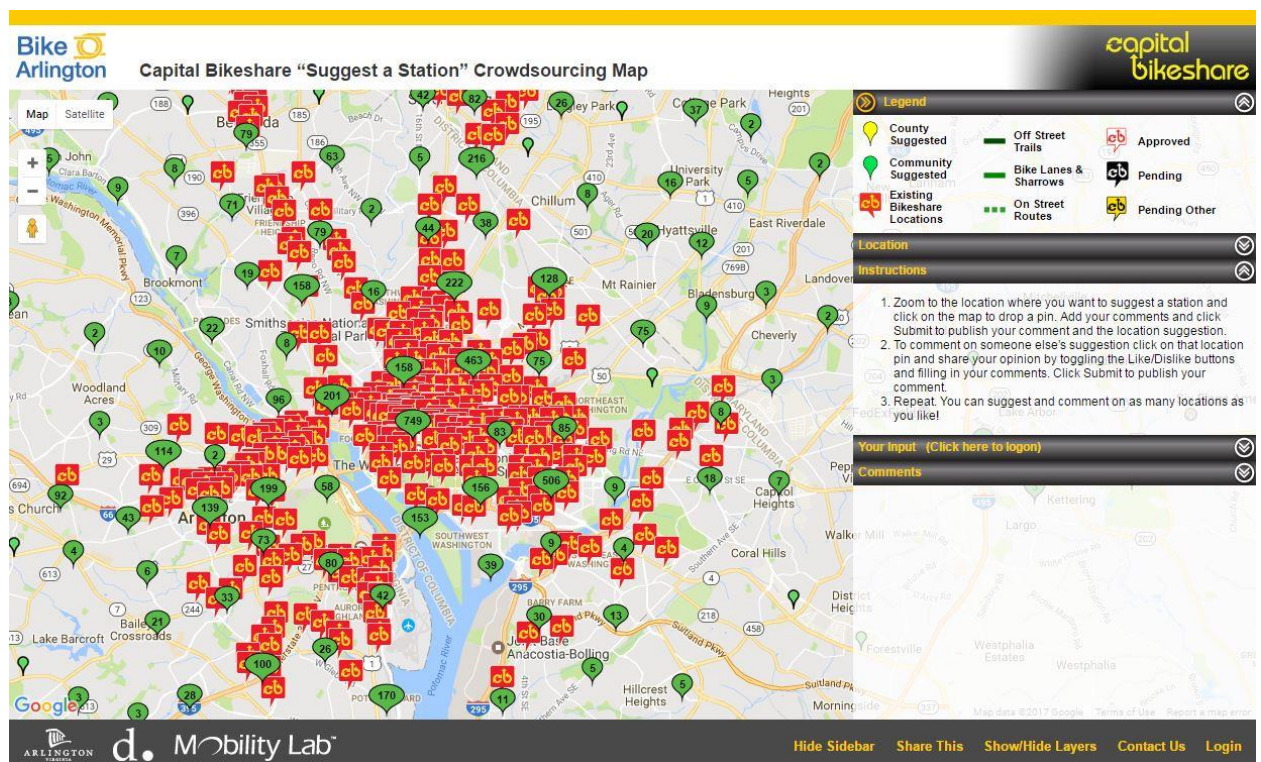


Figure 10: Capital Bikeshare Crowdsourcing Map Screenshot
<http://cabistations.com/>

5.3.2 Travel Training Programs

- ▷ *Programs that teach users about how to use existing services to increase comfort or provide assistance for people with special mobility needs.*

FAMILY OF SERVICES TRAVEL TRAINING – YORK REGION TRANSIT/VIVA, YORK REGION, ONTARIO, CANADA

York Region Transit offers travel training as a part of its Family of Services concept. The program is open to all customers, but is targeted at seniors, new immigrants, residents that are new to the Region, people entering the workforce, and paratransit users that have the potential to use conventional services for all or a portion of their trip. The program helps these customers get more familiar and comfortable with YRT's conventional service. Training includes several presentations and in-person training. A focus of the training is assistance at transfer points. YRT staff will assist customers as they transfer between services and communicate with transit operators to provide extra assistance to these customers.

① <https://www.yrt.ca/en/riding-with-us/myride-travel-training.aspx>

LEARNING TO USE PUBLIC TRANSIT PROGRAM – RÉSEAU DE TRANSPORT DE LONGUEUIL (RTL), LONGUEUIL, QUÉBEC, CANADA

The Réseau de transport de Longueuil (RTL) offers a Learning to Use Public Transit Program for students with special needs, in partnership with the Commission scolaire Marie-Victorin, the Riverside School Board and the Commission scolaire des Patriotes. The program is intended to assist students with special needs to become more comfortable and independent on transit.

Students with special needs receive free access to RTL's services in off-peak hours. Students experience their first transit trip alongside a teacher from the Program, and receive a user guide as well as other training to improve their level of comfort and confidence using the transit system.

① <http://www.rtl-longueuil.qc.ca/en-CA/news/press-release/2017/learning-to-use-public-transit-program-now-offered-in-3-school-boards/>

5.3.3 Mobility Research and Advocacy Groups

- ▷ *Groups that research new mobility initiatives and work towards finding complementary ways to integrate these new services and technologies with existing services.*

LA MAISON DE TEMPS ET DE LA MOBILITÉ – BELFORT, FRANCE

Belfort is a city in Eastern France with a metropolitan population of 300,000. The city is home to the Institute of Time and Mobility, with the support of multiple levels of government, including the European Union. Established in 2001, the goal of the institute is to improve the quality of daily life for citizens in terms of addressing their mobility needs. They also seek to reduce inequalities faced by people in regards to the time pressures and time spent on transportation in their lives. This is accomplished by finding synergies between institutions, universities, economic, and social players.

Traditional approaches to transportation put people at the mercy of public transit schedules. Those who are reliant on public transit are often disadvantaged in terms of the how much time they must spend on transportation and when they must travel. By researching and pilot testing new mobility initiatives, the Institute looks at ways that travel demand management can be used to improve the daily functions of cities and societies. The overarching goals are to give people more control over their time and scheduling, and allow people to achieve a better work-life balance.

Specific research areas for the Institute include:

- Integrated mobility and information
- On-demand transportation systems
- Workplace commuter planning and flexible work schedules
- Carpooling and carsharing
- Transportation for youth in evenings
- Flexibility in childcare

① <http://www.innovations-transport.fr/La-Maison-du-Temps-et-de-la?lang=fr>

MOBILITY INNOVATION LAB – TRANSLINK, VANCOUVER, BRITISH COLUMBIA, CANADA

The Mobility Innovation Lab (MI-Lab) will be the mechanism to address the recommendation of TransLink's preferred outcome of their Future of Driving report. The overarching goal for MI-Lab will be applying a design methodology that explores the particulars of the new role for transit, regulates price for equity and then work creatively with the tools available to conceptualize, test and refine policy or practical ideas.

Partnerships used to test technology have been largely saturated elsewhere (in places like the Bay Area in California, Michigan testing facilities, etc.), there has been no place to explore and test the profound social implications of the technology in an open, transparent and productive way.

Starting in January 2017 TransLink will be scoping and developing the MI-Lab concept and creating a corresponding implementation strategy, which will be developed in partnership with potential lab partners, municipalities, and other levels of government. Partners will help outline a charter strategy for the lab which will define its purpose and mandate, structure and organization, additional key partners' interests and next steps to bring MI-Lab to life.

AGENCE DES TEMPS – POITIERS, FRANCE

Poitiers is a city in Western France with a population of 300,000. The city is home to the Agency for Time, which examines and researches issues related to peoples' time in an urban context. Social time is diversifying as society evolves: more women working, reduced working hours, flexibility of working hours, extreme mobility for certain groups, and immobility for others. Different types of population frequent the public domain at different times of day. The consideration of the different time frames contributes to fighting against inequalities. Changing schedules upsets established practices, affects how people think and act and challenges ideas that are taken for granted.

The Agency's research has shown the need to create service and administration branches in local areas, the need for more frequent public transport and for child care that works for families with atypical working hours. This initiative highlighted the need to consult and work in partnership with local decision-makers. The research has resulted in concrete initiatives in Poitiers, notably the reform of work schedules in the public services, and a one-stop shop for school transportation requirements.

① http://www.grandpoitiers.fr/c__211_574__Presentation.html



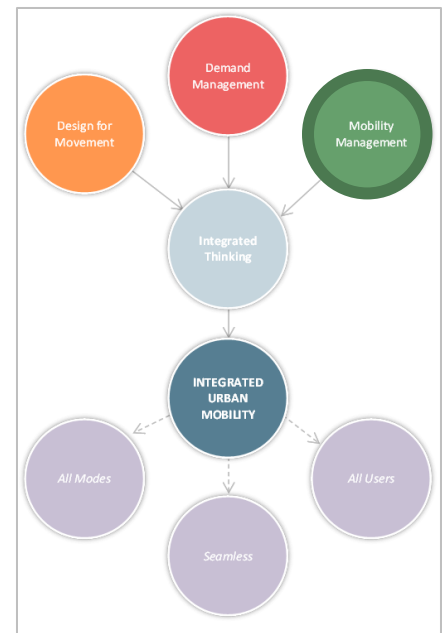
6.0 Mobility Management

CUTA defines Mobility Management as the

Coordination and optimization of all modes of transportation to enable ease of travel in urban areas

These means acknowledging all the ways that people can travel in a community (transit, bike, walk, drive a vehicle, passenger in a vehicle) and all of the different ways that these modes can be operated (owned bikes, bikeshare, owned car, carshare, rideshare, ridesource) and bringing them together for the benefit of the user. Bringing the modes and approaches together means building partnerships between two or more of them in order to better integrate mobility and provide opportunity for the user.

A key question that transit systems must consider is whether or not they have the resources, skills, and mandate to form these partnerships, or whether they are one of the services being brought together by another entity.



Example initiatives and programs for Mobility Management described in this toolbox are:

<p>Carshare Service Partnerships</p>	<ul style="list-style-type: none"> • Private Carsharing • Carsharing and Bike Integration • Carsharing and Parking Policies • Parking Partnerships • Smartcard Integration • Fare Integration Partnership • Government Administered Carshare Services
<p>Transportation Network Company (TNC) & Taxi Partnerships</p>	<ul style="list-style-type: none"> • Mobile App Integration • First Mile / Last Mile Partnerships • Guaranteed Ride Home / Late Night Service Partnerships • Paratransit Service Partnerships • Low Demand Area Service Partnerships
<p>Vanpool, Carpool, and Ridesharing Services</p>	<ul style="list-style-type: none"> • Dedicated Parking at Transit Facilities • Carpool Parking Permits and Discounted Parking Lots • First Mile / Last Mile • Mobile App Integration • Publicly Owned and Operated Carpool/Vanpool/Rideshare
<p>Bikeshare Services Partnerships</p>	<ul style="list-style-type: none"> • E-Bikesharing • Bikeshare Owned and Operated by a Non-Profit or Private Enterprise • Bike Friendly Transit Policies • Fare Integration with Transit • Bikeshare System Integration with Transit • Publicly Owned and Privately Operated Bikeshare • Publicly Owned and Operated Bikeshare
<p>Microtransit Services</p>	<ul style="list-style-type: none"> • Private Microtransit Services • Community Transportation • Publicly Operated Commuter Services • Area Based Demand Responsive Services • First Mile / Last Mile Demand Responsive Services
<p>Mobility-as-a-Service Models</p>	<ul style="list-style-type: none"> • Private MaaS Providers • Multimodal Transportation Trip Planning Applications • Public Private Partnerships • Public MaaS Providers

6.1 Carshare Service Partnerships

Carshare services are typically membership-based services that people use in urban areas to avoid car ownership, or reduce the number of vehicles that a family owns. Members often use carshare services along with transit, cycling and walking. There are two models of common carshare services:

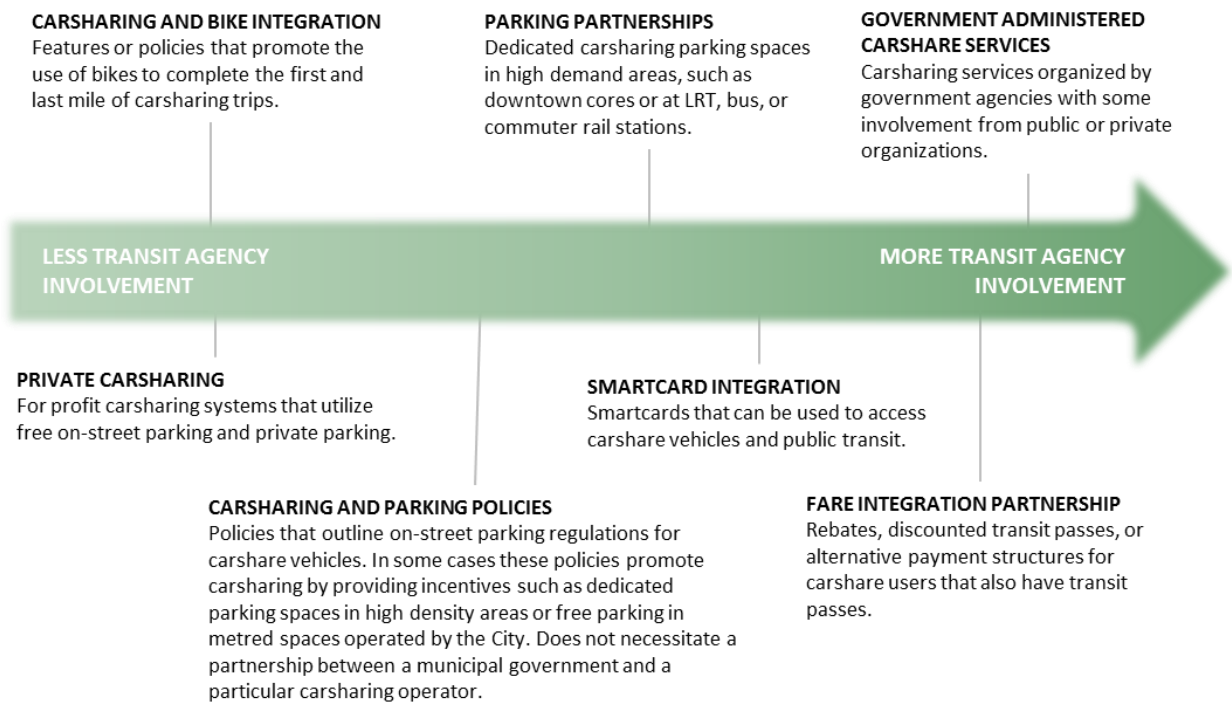
1. **Stationary Vehicles** – In this model, cars are assigned to particular parking spots by the service and members reserve a car and pick it up and return it to that parking spot. Time of use and distance traveled by the member are only restricted if the service has rules covering these items. This type of service works well for planned trips and can accommodate last minute trips if the vehicles at nearby spots are currently available.
2. **Flexible Vehicles** – In this model, a service locates vehicles throughout a service area, parking them either in designated locations, or negotiating an agreement to allow them to park anywhere in designated on-street parking spots. A member searches on line for the closest available vehicle currently available, picks up the vehicle, and then drops it off at the destination. This approach works well for last minute trips and can eliminate the need for advance trip planning if enough vehicles are provided by the service.

There is also a third, emerging car share model that is less well established, but growing quickly. Peer to peer car sharing uses an online platform to bring together individuals who have a car they are prepared to let others use at certain times with others who are looking for a vehicle at a particular time. The platform allows them to connect and provides a set of rules to manage the arrangements and a secure method of payment.

Within these three models, there are a variety of types of carsharing service partnerships, including:

- Private Carsharing, such as HiyaCar (United Kingdom);
- Carsharing and Bike Integration, such as Car2Go and the “Option Zone” in Portland, Oregon, and the City Carshare E-Bike Pilot in San Francisco, California;
- Carsharing and Parking Policies, such as the one in Calgary, Alberta;
- Parking Partnerships, such as the Zipcar Partnership with GO Transit in Ontario, and the On-Street Carsharing Program in Washington, DC;
- Smartcard Integration, such as the Hourcar and Metro Transit Partnership in Minnesota;
- Fare Integration Partnership such as the Duo Auto + Bus partnership in Montreal, Quebec; and
- Government Administered Carshare Services, such as Iniziativa Car Sharing in Italy.

Examples of carshare service partnerships with transit systems are described in the following sections. The graphic below illustrates the relative level of transit agency involvement in each partnership.



6.1.1 Private Carsharing

▷ For profit carsharing systems that utilize free on-street parking and private parking.

HIYACAR – UNITED KINGDOM

Program Description	HiyaCar is a new take on carsharing, which has a similar operating model as AirBnB and Uber. Members sign up to be car sharers or car users. Car sharers list their car on the website, making it available to be booked by others. Car users can then use the HiyaCar website to find cars in their area to book for various periods of time and check various prices. After a booking request has been received and approved, the car owner and car sharer have to sign an e-agreement. Next, they exchange the keys to the vehicle. This process can involve keyless remote entry or an in-person exchange of keys. HiyaCars insurance supersedes the individual car owners insurance. Drivers must be over the age of 23. Limitations are put on mileage as part of the agreement and the driver must fill the vehicle with fuel before returning.
Implementation	HiyaCar secured equity through online crowd sourcing in 2015. Since then HiyaCar has been successfully implemented for various applications, including: <ul style="list-style-type: none"> • Employer with pool cars replaced the fleet with keyless HiyaCars that could be used by employees. Spaces were reserved in the company parking lot for these vehicles. • Self drive fleet with excess capacity utilized the HiyaCar keyless option for bookings that were beyond regular business hours. • A commercial car park used it similar to a valet service
Outcome	Operational service for various applications
Next Steps	HiyaCar plans to continue expanding their service and find new partnerships.
Keys to Success	<ul style="list-style-type: none"> • Persistence
Challenges Faced	<ul style="list-style-type: none"> • Insurance requirements were a big barrier to overcome. HiyaCar has a policy through AXA that covers both the car owner and car driver, superseding the car owner's policy when the car is in use. This took one year to put in place. • Market research is very important prior to implanting the service. Council in one community embraced HiyaCar and helped lead to its implementation; however, locals were not very interested in using the service.

① <https://www.hiyacar.co.uk/>

① <https://www.crowdfundinsider.com/2016/05/85057-airbnb-for-cars-hiya-car-returns-to-seedrs/>

① <http://disrupts.com/hiya-car/>

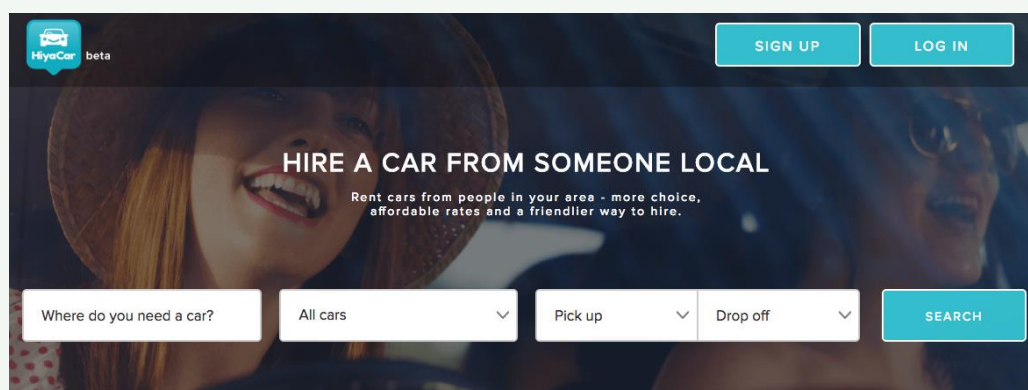


Figure 11: HiyaCar Homepage Banner

<https://www.hiyacar.co.uk/>

OKANAGAN CAR SHARE CO-OP (OGO) – KELOWNA, BRITISH COLUMBIA, CANADA

The Okanagan Car Share Co-op (OGO) started in 2013 and is based in Kelowna, BC. It currently has 12 vehicles and more than 350 members. Carshare vehicles are located strategically across Kelowna and can be reserved online via a smartphone, tablet, or computer. Customers must have a key fob to access the vehicle.

Customers can pay a one-time fee to become a co-op member or a monthly fee to become a casual member. Usage fees are separate from the membership fees and depend on the duration of the booking and mileage. Co-op membership gives the added benefit on being able to vote at the Annual General Meeting. Co-op members also can pay a monthly fee to upgrade to a Co-op+ membership, which comes along with reduced usage fees and is targeted at frequent users. OGO also offers corporate memberships and currently has nine corporate members.

<https://www.ogocarshare.ca/>

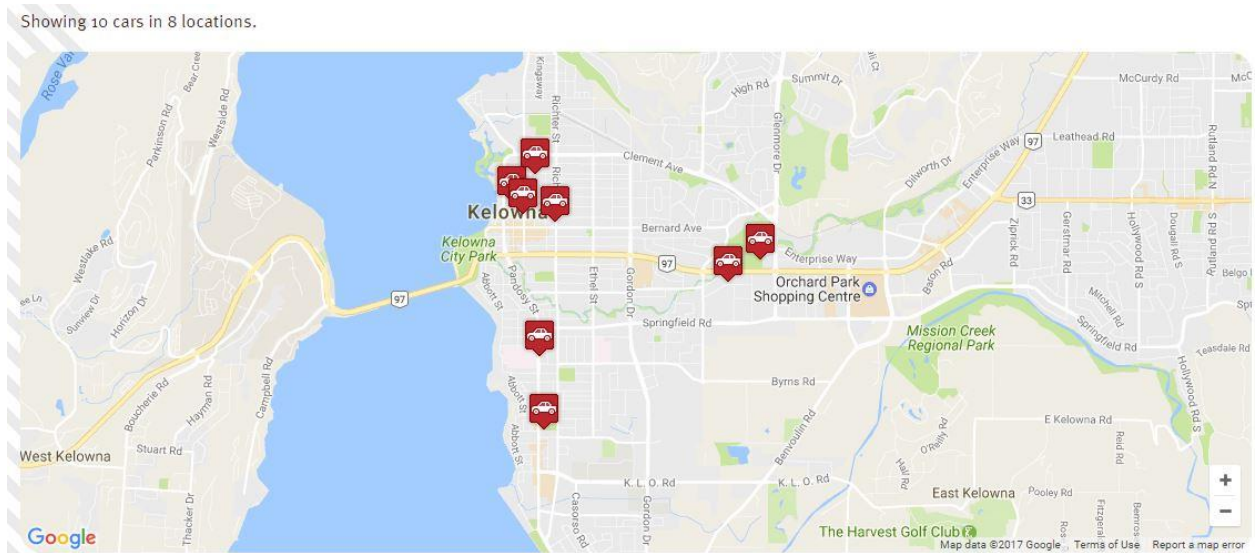


Figure 12: Screenshot from OGO Website Showing Current Locations of Vehicles
<https://www.ogocarshare.ca/>

6.1.2 Carsharing and Bike Integration

- ▶ *Features or policies that promote the use of bikes to complete the first and last mile of carsharing trips.*

CAR2GO – PORTLAND, OREGON, UNITED STATES

As of March 2015, Car2Go in Portland started equipping half of its carshare fleet (250 vehicles) with bike racks. The initiative was launched in response to a member survey which revealed that approximately 70% of Car2Go customers use a bike regularly and would like to see bike racks on Car2Go vehicles.

- ① https://www.car2go.com/media/data/usa/microsite-press/files/car2go_portland_bike_rack_program_press_release_-_final.pdf

“OPTION ZONE” – PORTLAND, OREGON, UNITED STATES

To help promote the use of carsharing, the City of Portland provides 50 reserved on-street carsharing spaces called “Options Zones”. These spaces are marked with paint on the pavement and have a bright orange parking meter pole with a bike rack attached. Cost of installation of each options zone was approximately \$260 and the City offered a credit to carsharing companies that provided the bike rack. Additional on-street parking spaces are put up for auction each year and carsharing companies can bid on the spaces. The minimum bid is equivalent to the lost revenue from metered parking plus administration and maintenance fees.

- ① <https://www.portlandoregon.gov/shared/cfm/image.cfm?id=121293>
- ① <http://ops.fhwa.dot.gov/publications/fhwahop16022/ch4.htm>

CITY CARSHARE E-BIKE PILOT – SAN FRANCISCO, CALIFORNIA, UNITED STATES

City Carshare is a non-profit carsharing program based in San Francisco, California. In 2013, City Carshare was awarded funding to conduct an electric bike (e-bike) sharing pilot program. The pilot will look at implementing an electric bikesharing system based at stations that are adjacent to carsharing stations. As of September 2016 the pilot had not started, but is anticipated to be completed by July 2018.

- ① http://ops.fhwa.dot.gov/congestionpricing/value_pricing/projects/not_involving_tolls/dyn_ride_sharing/ca_link_electric.htm

6.1.3 Carsharing and Parking Policies

- ▷ *Policies that outline on-street parking regulations for carshare vehicles. In some cases these policies promote carsharing by providing incentives such as dedicated parking spaces in high density areas or free parking in metred spaces operated by the City. Does not necessitate a partnership between a municipal government and a particular carsharing operator.*

CARSHARE PARKING POLICY – CALGARY TRANSIT, CALGARY, ALBERTA, CANADA

<p>Program Description</p>	<p>The Carshare Parking Policy aims to help improve carshare parking in Calgary, allowing fair access for not only carshare users but all users in commercial areas (like the downtown) and residential areas. The policy includes rules on where carshare vehicles can park in commercial areas and residential areas, information on how carshare companies can request dedicated on-street parking spaces for their vehicles, and the parking and enforcement costs.</p> <p>The carshare parking policies focus on on-street parking as offstreet parking arrangements do not have the same impact on the general public and can be addressed through individual contractual arrangements.</p>
<p>Implementation</p>	<p>The Carshare Parking Policy was approved by City Council in March 2015. Its implementation was spurred on by the recent success of carsharing companies in Calgary, such as Car2Go and Calgary Carshare. Further, carsharing is something that the City of Calgary wanted to promote because it offers an affordable, convenient and energy-efficient alternative to owning a private vehicle. The issue was that many carshare vehicles are stored on public streets when they are not being used and will increase as carsharing becomes more popular.</p> <p>Transportation, Planning & Development, Calgary Parking Authority, and Business Revitalization Zones (including the Calgary Downtown Association) were involved in developing the policy. Implementing the policy required changes to Calgary’s overarching parking policies and bylaws.</p>
<p>Outcome</p>	<p>Calgary Carshare has operated in Calgary since 1999 with a small fleet of vehicles. Since car2go entered the market in 2013, Calgary has seen a rapid expansion in carshare membership and usage, with the Car2Go fleet growing from 150 vehicles to over 550 vehicles in 2015. There tends to be no net change in the amount of transit use by carshare members, though there is some indication that carsharing and light rail transit (e.g. Calgary’s Ctrain) can work effectively together. Smaller one-way carsharing vehicles, such as those used by Car2Go, also take up less parking space per vehicle. Carsharing currently represents less than 1% of all travel in Calgary. However, these results do contribute to the long term goals in the Calgary Transportation Plan.</p> <p>Transit customers have reacted positively to programs to encourage car-sharing.</p>
<p>Next Steps</p>	<p>Calgary currently has plans to review the availability of car-share and ride-share stalls at light rail transit park and ride lots. They also want to ensure that the introduction of new parking bylaws and practices meets the following principles:</p> <ul style="list-style-type: none"> • Facilitate access to carshare services for citizens of Calgary. • Treat all carshare organizations (CSOs) equitably, while acknowledging the differences between round-trip and one-way carshare services. • Treat carshare users like all other drivers in Calgary, while interacting with CSOs like other businesses that operate in Calgary. • Effectively manage low turn-over and clustering of carshare vehicles in congested parking areas, when and where this activity occurs. • Allow portions of existing or new parking space to be dedicated to carshare parking in commercial and residential areas.
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Recognition of the value of on-street spaces to the Business Revitalization Zones • Addressing the perception issues associated with car-share vehicles “bunching”
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • One-way carshare vehicles have been observed clustering together on some streets adjacent major employment or educational centres. In some circumstances, large portions of individual blocks may be occupied by carsharing vehicles for extended periods of time. • Standard parking enforcement activities have highlighted that a minority of one-way carshare vehicles remain parked in excess of posted time restrictions. Although these situations are not always consistent, the markings on carsharing vehicles make such events highly visible to business owners and the public. • Some inquiries to The City and Calgary Parking Authority (CPA) have also highlighted the perception that carshare vehicles receive special treatment. Although special arrangements have been made between The City, CPA and CSOs to allow effective access to carshare vehicles, some perceptions of special treatment, such as provision of free parking, are inaccurate.

6.1.4 Parking Partnerships

- ▶ *Dedicated carsharing parking spaces in high demand areas, such as downtown cores or at LRT, bus, or commuter rail stations.*

ZIPCAR PARTNERSHIP (ONTARIO) – GO TRANSIT, ONTARIO, CANADA

In 2014 GO Transit and Zipcar entered a partnership that made Zipcar carsharing vehicles available at six GO stations. It has since been expanded to a total of 14 GO stations across the Greater Toronto Hamilton Area (GTHA). The goal of the program is to provide GO Transit users another way to access GO services and enable people to more easily reach destinations that are not serviced by GO Transit.

Zipcar vehicles have dedicated parking spaces at each station and can be reserved via the Zipcar mobile app, online, or by phone. GO Transit does not provide any subsidies for those that opt to use Zipcar.

① <http://www.zipcar.com/press/releases/metrolinx2015>

ON-STREET CARSHARING PROGRAM – DISTRICT DEPARTMENT OF TRANSPORTATION, WASHINGTON, DISTRICT OF COLUMBIA, UNITED STATES

The District Department of Transportation in Washington D.C. has had reserved on-street parking spaces for car share vehicles since 2005. Carsharing companies can apply for spaces through a special permitting program through the Public Space Regulations Administration (PSRA). In addition to reserved spaces, carsharing vehicles can park on residential streets or metered spaces for free. Further, they are not subject to the posted time limit at metered locations. Currently, Zipcar, Enterprise, and Car2Go are operating carsharing programs in D.C.

① <https://ddot.dc.gov/page/street-carsharing-program>

6.1.5 Smartcard Integration

- ▶ *Smartcards that can be used to access carshare vehicles and public transit.*

HOURLCAR AND METRO TRANSIT PARTNERSHIP – MINNESOTA, UNITED STATES

Metro Transit operates the public transit system in Minneapolis and St. Paul, Minnesota. As of September 2015, Metro Transit's smartcards (Go-To, U-Pass, College Pass, and Metropass) have had the added functionality of being able to unlock Hourcar carshare vehicles. Chips embedded in the cards allow transit users to access Hourcar vehicles at over 60 locations across the Twin Cities.

① <https://www.metrotransit.org/go-to-cards-provide-hourcar-access>

① <http://www.startribune.com/go-to-cards-can-now-be-used-for-both-transit-and-car-sharing/325183601/>

6.1.6 Fare Integration Partnership

- ▶ *Rebates, discounted transit passes, or alternative payment structures for carshare users that also have transit passes.*

DUO AUTO + BUS – SOCIÉTÉ DE TRANSPORT DE MONTRÉAL, MONTRÉAL, QUÉBEC, CANADA

The Société de transport de Montréal (STM) and carsharing company Communauto have partnered to provide a discount to customers that make use of public transit and carsharing services. Through the “Duo Auto + Bus” program Communauto subscribers are eligible to receive a \$3.45/month rebate off of STM monthly passes if they commit to buying monthly passes for the year. They are also exempted from paying the refundable \$500 membership fee. Members that add BIXI services to their account are eligible for an additional \$59 discount (i.e. the TRIO BIXI-Auto-Bus program).

Duo Auto + Bus was implemented in 2008 through an agreement between Communauto and STM. Communauto has similar types of agreements in place with Autorité régionale de transport métropolitaine (ARTM), Réseau de transport de la Capitale (RTC), Société de transport de Laval (STL), Société de transport de l’Outaouais (STO), and Société de transport de Sherbrooke (STS).

① <http://www.communauto.com/duo/en/amt.html>

6.1.7 Government Administered Carshare Services

- ▶ *Carsharing services organized by government agencies with some involvement from public or private organizations.*

INIZIATIVA CAR SHARING NATIONAL CIRCUIT OF CAR SHARING – ITALY

In 2005, the Italian Ministry of Environment set up a policy framework to help guide the establishment of carsharing programs in various cities and provinces. Instead of providing monetary funding, the Iniziativa Car Sharing (ICS) provides municipalities various services and infrastructure needed to implement a carsharing program. This includes the provision of various technologies and assistance with design, legal, administrative, customer support, marketing, and promotion for the program. The goal of the ICS is to help promote uniformity across all of the carsharing programs in Italy.

① <https://carloiacovini.com/2013/01/21/why-italy-is-the-right-country-for-car-sharing/>

① <http://www.icscarsharing.it/main/english>

① <https://www.autovistaintelligence.com/blogs/news/car-sharing-grows-in-italy>

6.2 TNC & Taxi Partnerships

Traditional carpool and vanpool services have been operating for many years, but have had a relatively small impact in Canada (compared with the United States). These services have generally required ongoing and regular commuter trips by members/subscribers in order to be successful. Modern rideshare services take advantage of mobile technology to instantly connect drivers with riders for all purposes of trips happening when users want to travel. Uber and Lyft are two examples of such services, and are often called Transportation Network Companies (TNC). Traditional taxi services are also evolving to make greater use of mobile technology and compete with the new TNC services. More recently, transit agencies have begun partnering with ridesharing services to expand their coverage into new areas and help improve elements of their service that are unprofitable and/or ineffective.

Transit agencies are partnering with TNC and taxi services in many different ways. The simplest partnerships involve transit agencies including TNC and taxi services within their mobile app, to provide the customer with additional options, particularly if or when transit service may not be available. Dallas Area Rapid Transit (DART) and the Memphis Area Transit Authority (MATA) are examples of such integration.

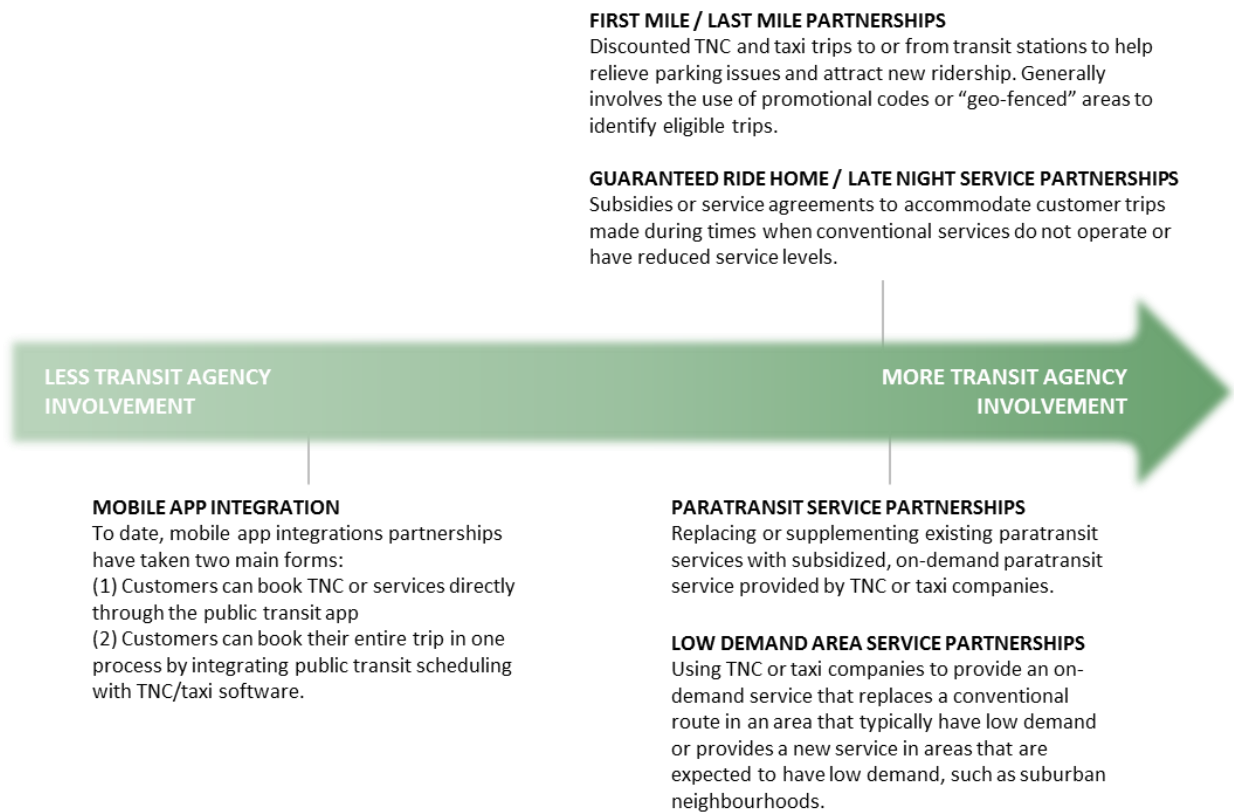
Some partnerships take advantage of TNC and taxi services to provide cost-effective mobility in areas or time periods of low demand. These partnerships may include:

- First mile / last mile partnerships, such as Rails to Rideshare in Philadelphia, Pennsylvania, and the MARTA, Uber, and Lyft partnership in Atlanta, Georgia;
- Guaranteed ride home / late night service partnerships, such as the TD Late Shift program offered in Pinellas County, Florida, the Guaranteed Ride Home Program in Minnesota, and the Emergency Ride Home program offered by Metrolinx in Ontario; and
- Low demand area service partnerships, such as the GO Dublin! Rideshare Pilot in Dublin, California.

Other partnerships use TNC and taxi service to supply or supplement paratransit service provided by the transit agency. This is currently being piloted in Boston, Massachusetts.

With all TNC service partnerships, legislation can be a key challenge, and whether it allows the new services to operate and be part of the solution. Another challenge with TNC partnerships can be information sharing – as private corporations, TNC organizations can be reluctant to share their usage information.

Examples of modern rideshares service partnerships with transit systems are described in the following sections. The graphic below outlines the relative amount of transit agency involvement required for each partnership.



6.2.1 Mobile App Integration

- ▷ *To date, mobile app integrations partnerships have taken two main forms:*
 - (1) *Customers can book TNC or services directly through the public transit app*
 - (2) *Customers can book their entire trip in one process by integrating public transit scheduling with TNC/taxi software.*

DALLAS AREA RAPID TRANSIT (DART) & LYFT PARTNERSHIP – DART, DALLAS, TEXAS, UNITED STATES

DART has partnered with Lyft to help address first mile/last mile issues that are otherwise expensive to address with conventional transit services. Lyft services can be accessed and booked through the DART mobile app. Lyft provides DART users a limited time promo code for discounted trips.

① <http://www.dart.org/news/news.asp?ID=1213>

MEMPHIS AREA TRANSIT AUTHORITY, UBER & TRANSLOC PARTNERSHIP – MATA, MEMPHIS, TENNESSEE, UNITED STATES

In January 2016 TransLoc announced its partnership with Uber and Memphis Area Transit Authority (MATA) to develop an integrated mobility interface. The app will allow users to book and pay for a trip using any combination of public transit, Uber, and walking. During the pilot customers will be given optimized routes from which to choose based on origin, destination, and temporal inputs. A similar arrangement has also been reached with Go Triangle, Uber, TransLoc in Raleigh/Durham, North Carolina.

① <http://transloc.com/transloc-and-uber-partner-to-pioneer-a-new-standard-in-public-transit/>

6.2.2 First Mile / Last Mile Partnerships

- ▷ *Discounted TNC and taxi trips to or from transit stations to help relieve parking issues and attract new ridership. Generally involves the use of promotional codes or “geo-fenced” areas to identify eligible trips.*

MARTA, UBER & LYFT PARTNERSHIP – MARTA, ATLANTA, GEORGIA, UNITED STATES

MARTA has partnered with Uber and Lyft for more seamless travel to their final destinations. Uber and Lyft advertise within the MARTA app, but passengers must book the service using the Uber or Lyft app. Uber and Lyft drivers are allowed to use designated taxi stands at MARTA stations. The cost for Uber and Lyft trips are covered entirely by the rider, but Uber and Lyft provided discounts on their first few rides to customers as an incentive. MARTA and Uber first entered into a partnership after realizing that riders were frequently using Uber to get to and from MARTA stations.

① <http://www.bizjournals.com/atlanta/news/2016/03/29/viewpoint-why-uber-atlanta-is-proud-to-support.html>

① <http://www.citylab.com/cityfixer/2015/08/uber-and-public-transit-are-trying-to-get-along/400283/>

RAILS TO RIDESHARE – SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY, PHILADELPHIA, PENNSYLVANIA, UNITED STATES

<p>Program Description</p>	<p>The “Rails to Rideshare” program is a pilot partnership between SEPTA and Uber. For the pilot, Uber provided discounted trips to and from 11 LRT stations in SEPTA’s service area in exchange for SEPTA promoting Uber on its mobile app / website, and at its stations.</p> <p>Passengers could book Uber trips through the regular Uber app. A 40% discount (up to \$10) was automatically applied as long the Uber trip was booked to or from one of the participating LRT stations. GPS was used to confirm that people were actually picked up or dropped off at a station. All booking, scheduling, fare payment, customer service, and operations related tasks were performed by Uber and were treated the same as a regular Uber trip. SEPTA had discussions with Uber prior to the pilot to ensure there would be enough drivers around the stations to service the demand; however, there were no capacity issues during the pilot.</p>
<p>Implementation</p>	<p>The pilot launched on May 24, 2016 and ended September 5, 2016. SEPTA considered extending the pilot; however, it was not extended due to other priorities. Although the partnership was initiated by Uber, SEPTA had had discussions with Lyft prior to implementing the pilot. SEPTA’s goals for the pilot were to increase LRT ridership and to address parking issues at LRT stations. A particular goal was to attract potential riders who, in the absence of Uber’s services, would not have access to the rail stations.</p>
<p>Outcome</p>	<p>SEPTA considers the pilot program as a success. Uber reported that there was a 60% increase in Uber pickups from the participating stations. However, SEPTA has no data to determine whether this resulted in an increase in LRT ridership. Public perception of the pilot was generally positive. While this service model has the potential to be replicated at other LRT stations, SEPTA reports that it would only be possible if Uber is able to provide the 40% discount.</p>
<p>Next Steps</p>	<p>While SEPTA is considering a second phase, it is not yet certain whether it would replicate the initial pilot or include other features. Moreover, SEPTA is not yet considering the replacement of fixed route conventional service or paratransit service with Uber. It is monitoring the initiatives of other transit initiatives in this regard, particularly the MBTA’s recent pilot in Boston to use TNC’s for some paratransit trips.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Relatively low level of effort required to manage the program • Relatively low cost for SETPA because the discount for all trips was provided by Uber
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • There was some abuse, as some non-transit users walked to LRT stations to book an Uber trip to take advantage of the 40% discount; • SEPTA did not receive much data from Uber as the issues were not explicitly addressed in the agreement. In retrospect, SEPTA wishes it had discussed data sharing with Uber prior to the agreement being finalized; • The program was not well communicated to the public. Many passengers took Uber trips from the stations but did not realize they were getting a discount until they were billed. SEPTA was also of the opinion that most customers did not even know the pilot was in operation.

6.2.3 Guaranteed Ride Home / Late Night Service Partnerships

- ▷ *Subsidies or service agreements to accommodate customer trips made during times when conventional services do not operate or have reduced service levels.*

GUARANTEED RIDE HOME PROGRAM – METRO TRANSIT, MINNESOTA, UNITED STATES

Registered participants can request reimbursements up to four times per year for unexpected trips with valid documentation, up to a maximum of \$100. These trips can include taxi, car-share, ridesharing company (Uber, Lyft, etc.) or car rentals. To qualify for this service, registrants must commute to school or work using modes other than SOV's at least three times per week and register online. Customers pay out of pocket for the trip, and then submit a form for reimbursement through mail.

① <http://www.metrotransit.org/guaranteed-ride-home>

TD LATE SHIFT – PINELLAS SUNCOAST TRANSIT AUTHORITY, PINELLAS COUNTY, FLORIDA, UNITED STATES

The TD Late Shift pilot project (beginning August 1, 2016) offers late night and early morning rides to low income residents with no access to a vehicle. This service provides up to 23 free Uber rides for people with less than a certain income that can be used during times when regular transit service is not offered (i.e. 9pm-6am). Users can also make use of one subsidized daytime ride per month for \$3. This program is being funded by a \$300,000 grant awarded by the Commission for the Transportation Disadvantaged (TD). The service is only available within the Pinellas County.

① <http://www.psta.net/press/07-2016/index.php>

EMERGENCY RIDE HOME – SMART COMMUTE, METROLINX, ONTARIO, CANADA

Through the Smart Commute Emergency Ride Home (ERH) program, employees that commute using sustainable modes (i.e. all modes except single occupancy vehicles) are eligible to receive up to \$75 per ride for transportation costs in the event of an emergency. Emergencies covered through the program include, personal or family member medical-related events, unscheduled overtime, and unexpected absences of carpooling partners. Commuters can use any means of transportation (e.g. taxi, GO Transit, etc.) for an emergency trip and are reimbursed for the trip within six weeks of the reimbursement request. There is no limit to the number of times that employees can use the ERH program in a given year.

① <http://smartcommute.ca/more-options/emergency-ride-home/>

6.2.4 Paratransit Service Partnerships

- ▶ *Replacing or supplementing existing paratransit services with subsidized, on-demand paratransit service provided by TNC or taxi companies.*

ON-DEMAND PARATRANSIT PILOT – MASSACHUSETTS BAY TRANSPORTATION AUTHORITY, BOSTON, MASSACHUSETTS, UNITED STATES

<p>Program Description</p>	<p>The Massachusetts Bay Transportation Authority (MBTA) recently began a one-year on-demand paratransit pilot program. The goal of the program is to explore an alternative service delivery model that improves the customer experience and has the potential to reduce operational costs in comparison to the existing conventional paratransit service.</p> <p>For this pilot the MBTA contracted Uber and Lyft to provide on-demand paratransit services for 400 of its registered paratransit users across its entire service area. All aspects related to scheduling, dispatch, and customer service are provided by Uber and Lyft. Uber and Lyft also provide all of the vehicles and drivers for the pilot. Conversely, the MBTA handles promotion and overall management of the program in addition to providing a subsidy for all trips. No special branding or mandatory driver training has been used in the pilot. Trip requests made through the pilot are treated as a standard trip request by Uber and Lyft, with the exception of the subsidy provided by the MBTA.</p> <p>Fare payment is completed by pilot customers through the Uber and Lyft smartphone apps. Users without access to a smartphone can call into the MBTA call centre to book a trip with Lyft or request a free smartphone from Uber. For each trip, the customer pays the first \$2.00, the MBTA pays the next \$13.00, and then the customer pays any remaining cost. These trips are still subject to Uber and Lyft's "surge pricing" which increases trip prices during times of high demand. Uber and Lyft bill the MBTA on a monthly basis to recover the portion owed by MBTA.</p>
<p>Implementation</p>	<p>The pilot program began in Fall 2016 and has been running for approximately two months as of December 13, 2016. Although the pilot is currently scheduled to run for one year, the MBTA reserves the right to terminate the pilot at any time. Consideration is also being made for an extension or expansion of the pilot. The existing paratransit service is operating simultaneously with the pilot program.</p>
<p>Outcome</p>	<p>Limited conclusions can be drawn since the program has only been operating for two months. Performance metrics are evaluated and reported on a monthly basis. In the December 2016 report, the MBTA noted that the average trip cost per person has decreased from approximately \$30 for the existing paratransit service to \$9 for the pilot service. They also noted an increase in ridership from 10 to 13 trips per person per month. Overall, there has been no significant effect on the operational costs of the on-demand service in comparison to existing paratransit service; however, user feedback has been positive.</p>
<p>Next Steps</p>	<p>The next steps will depend on the overall success of the pilot. Things being considered include:</p> <ul style="list-style-type: none"> • Allow the use of UberPOOL. • Adjust subsidy per trip • Increase co-payment per trip (i.e. user cost) • Modify the limit on number of trips per month • Modify eligibility requirements for entry into pilot • Create additional pilot for high-volume, high conversion customers • Create a pilot to evaluate an on-demand service to replace certain suburban fixed routes • Create a pilot to evaluate an on-demand service to replace existing late night service
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Convenience of use in comparison to the existing paratransit service • Uber and Lyft being willing to step outside of their regular comfort zone • The MBTA being willing to test out something new and innovative
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • Operational costs are higher than desired • Directing customer feedback to Uber and Lyft

6.2.5 Low Demand Area Service Partnerships

- ▷ *Using TNC or taxi companies to provide an on-demand service that replaces a conventional route in an area that typically have low demand or provides a new service in areas that are expected to have low demand, such as suburban neighbourhoods.*

GO DUBLIN! RIDESHARE PILOT – LIVERMORE AMADOR VALLEY TRANSIT AUTHORITY, DUBLIN, CALIFORNIA, UNITED STATES

Originally called “Wheels on Demand”, the Go Dublin pilot is a partnership the Livermore Amador Valley Transit Authority (LAVTA) and DeSoto Cab Co., Uber, and Lyft. LAVTA is using the pilot to determine if it is economically feasible to subsidize TNC and taxi companies to deliver transit service to several low-density suburban areas in Dublin, California. During the pilot LAVTA is paying 50 percent of the cost of eligible trips, up to a maximum of \$5 per trip. Only trips that utilize ridesharing services and begin and end within the designated pilot service area are eligible for the subsidy.

The pilot program is being conducted in an area previously served by a conventional fixed route. During the pilot all of the service hours from this route have been transferred to other LAVTA routes.

① <http://www.wheelsbus.com/godublin/>

6.3 Vanpool, Carpool, and Ridesharing Services

Sometimes called ridematching or ridesharing services, carpool and vanpool services are often run or supported by a public agency or a non-profit group. As an example, the Vanpool Program in King County, Washington, is run by King County Metro Transit. The services are most often designed to accommodate regular commuting trips. Modern services will typically use a website where individuals can register that they are looking for a ride or have a vehicle and are willing to drive one or more individuals. Based on the entered trip origins and destinations, matches are made and the individuals are contacted to see if an arrangement can be made. Riders are expected to pay an appropriate fee (either fixed or based on the trip distance) to the driver. Some services offer online payment arrangements. Services can be organized within an employer, multi-employer campus or area, or for a broad community. These services differ from carshare or transportation network company services in that the vehicle is owned by the driver of the carpool vehicle and/or is one of the people going to the destination. These services can conveniently be used to provide first mile / last mile connectivity, as is the case with the TripPool program run by King County Metro Transit in King County, Washington.

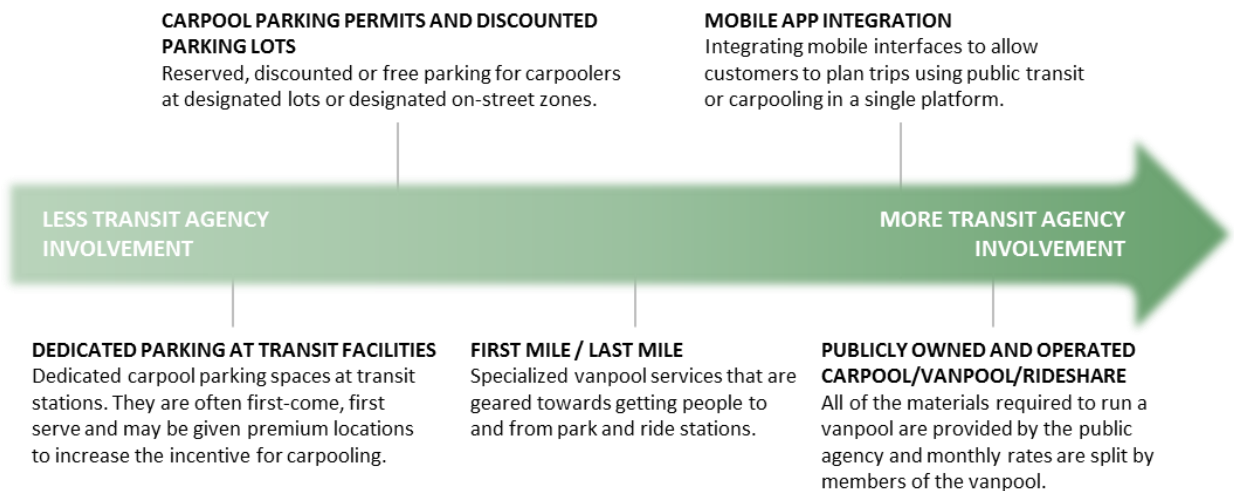
In addition to the basic service described above, some services will also offer guaranteed ride home arrangements to accommodate non-drivers who suddenly have to travel home unexpectedly (e.g., school calls about a sick child) or work late. This is done to overcome one of the fears of potential users of a service that they will lose the flexibility to accommodate sudden changes in their schedule.

Some services will organize vanpools to accommodate larger groups of people with the same general origins and destinations. The vans are most often purchased and maintained by the organizing service and one of the people using the vanpool agrees to be the driver in return for a significantly reduced fee.

Transit agencies who do not wish to be heavily involved in these programs can support them in other ways, such as with:

- Dedicated parking for shared-ride services at transit facilities, as is offered by TransLink (Vancouver, British Columbia) and the Edmonton Transit System (Edmonton, Alberta);
- Carpool parking permits and discounted parking lots, as is offered in Seattle, Washington, and at GO Transit stations in the Greater Toronto and Hamilton Area (GTHA), Ontario; and
- Mobile app integration, such as the Netlift Pilot Project in Longueuil, Quebec.

Examples of vanpool, carpool, and ridesharing services are outlined in the following sections. The graphic below depicts the relative degree of transit agency involvement required for each type of program.



6.3.1 Dedicated Parking at Transit Facilities

- ▶ *Dedicated carpool parking spaces at transit stations. They are often first-come, first serve and may be given premium locations to increase the incentive for carpooling.*

PARK & RIDE CARPOOL PROGRAM – TRANSLINK, VANCOUVER, BRITISH COLUMBIA, CANADA

TransLink offers priority parking at three park and ride lots to customers that share a ride with at least one other person. Currently there are 52 priority spaces across the three participating stations. These spaces are reserved for carpoolers until 9:00am and cannot be reserved in advance.

① <http://www.translink.ca/en/Getting-Around/Driving/Carpooling.aspx>

LRT CARPOOL PARKING – EDMONTON TRANSIT SYSTEM, EDMONTON, ALBERTA, CANADA

Edmonton Transit System’s LRT Carpool Parking Program promotes carpooling through reserved stalls at several LRT stations. Currently, the Stadium LRT Station, Belvedere LRT Station, and Clareview LRT Station each have five reserved stalls for carpoolers. Each space is signed with a “carpool parking only” sign.

① <https://www.edmonton.ca/ets/lrt-carpool-parking.aspx>

6.3.2 Carpool Parking Permits and Discounted Parking Lots

- ▶ *Reserved, discounted or free parking for carpoolers at designated lots or designated on-street zones.*

CARPOOL PARKING – SEATTLE, WASHINGTON, UNITED STATES

Seattle has a carpool program through its Department of Transportation. To be eligible for designated on-street parking, the carpool must be made up of two adults that live more than 3 km from the parking location, they must share more than 50 percent of a common route to/from work, and must commute together at least four days per week. Parking rates range from \$300 to \$600 per quarter. The spaces in designated zones are reserved between 7:00am and 10:00am, at which point they are opened up to the general public. Carpoolers can also get certified to park at over 15 off-street garages.

① <https://www.seattle.gov/transportation/parking/carpool.htm>

GO TRANSIT CARPOOL PARKING – GO TRANSIT, GREATER TORONTO AND HAMILTON AREA (GTHA), ONTARIO

GO Transit currently has 583 designated carpool parking spaces across 50 stations. Carpoolers must apply for a free carpool parking permit online prior to using the designated spaces. Each car is covered under a unique permit. New permits can take up to six weeks to be processed.

- ① <http://www.gotransit.com/public/en/stations/carpooltogo.aspx>
- ① <http://www.gotransit.com/public/en/stations/parking.aspx>
- ① http://www.gotransit.com/public/en/aboutus/GO%20Info%20To%20Go_EN_Jan%202017.pdf



Figure 13: GO Transit Carpool Map
<http://www.gotransit.com/public/en/stations/carpooltogo.aspx>

6.3.3 First Mile / Last Mile

- ▶ *Specialized vanpool services that are geared towards getting people to and from park and ride stations.*

TRIPPOOL – KING COUNTY METRO TRANSIT, KING COUNTY, WASHINGTON, UNITED STATES

King County Metro started a carpool pilot program called TripPool in Fall 2015. Through the pilot, volunteer drivers pick up registered TripPool users and drive them to park and ride locations or transit centres. Vans for the program are provided by King County Metro. Each TripPool has at least two designated drivers for redundancy.

TripPool is an on demand service that users can access the service through the iCarpool app. Within the app is a list of available stops. Trip requests must be made at least 60 minutes in advance of the trip and riders must be accepted into the carpool by the TripPool driver. After the trip is over, drivers can give each passenger a rating.

Volunteer drivers ride for free and passengers pay \$1.50 for the first 8 km and \$0.26 for each additional 1.6 km. Passengers that link their iCarpool account with RideshareOnline.com are reimbursed in the form of iCarpool credits for any charges greater than \$2.75. Further reimbursements are available for users with an ORCA card.

① <http://metro.kingcounty.gov/tops/van-car/programs/trippool/index.html>

6.3.4 Mobile App Integration

- ▶ *Integrating mobile interfaces to allow customers to plan trips using public transit or carpooling in a single platform.*

NETLIFT PILOT PROJECT – RÉSEAU DE TRANSPORT DE LONGUEUIL (RTL), LONGUEUIL, QUÉBEC, CANADA

In October 2014, the the Réseau de transport de Longueuil (RTL) launched the Netlift pilot project, which is a carpooling app that integrates with public transit. Drivers that sign up for the program get a reimbursement on a portion of their vehicle maintenance costs, gas, and parking expenses. Passengers can create a profile that outlines what days they need to travel, what time of day they would like to depart, and what modes of travel they are willing to use. The app then matches the trip request with drivers that can accommodate all or a portion of the trip, leveraging existing public transit services wherever possible. Drivers and passengers can rate each other after each trip to assist with future matching.

① <http://www.rtl-longueuil.qc.ca/en-CA/news/press-release/2015/netlift-pilot-project/>

① <https://www.netlift.me/#get>

6.3.5 Publicly Owned and Operated Carpool/Vanpool/Rideshare

- ▶ *All of the materials required to run a vanpool are provided by the public agency and monthly rates are split by members of the vanpool.*

VANPOOL PROGRAM – KING COUNTY METRO TRANSIT, KING COUNTY, WASHINGTON, UNITED STATES

The King County Metro's Vanpool program begins with a group of at least five people. Anyone can create their own vanpool or join an existing group. Each vanpool has at least two drivers and one record keeper and can accommodate up to 7 or 14 people depending on the van. The van is parked at one of the drivers' homes overnight. Collectively each vanpool group decides on the route and pickup/drop-off times and locations. The cost of the vanpool is split between the riders and can be subsidized by employers. Fares vary by work week schedule and round trip distance. Individual fares decrease with additional vanpool members. The van, insurance, gas, maintenance, 24 hour road assistance, and emergency rides home are provided by King County Metro and covered by the vanpool fare. Vanpools also ride for free on certain toll roads.

A third-party app, Vanpooler, is used by the program to organize rides. King County Metro Transit offers incentives for participation in the program, such as offering two free months for every 12-passenger vanpool initiated, and \$150 to each vanpool group with 8 or more members active after 6 months.

- ① <http://metro.kingcounty.gov/tops/van-car/programs/vanpool/index.html#mb=https://www.youtube.com/watch?v=AP0GMCOKLgM> | grid

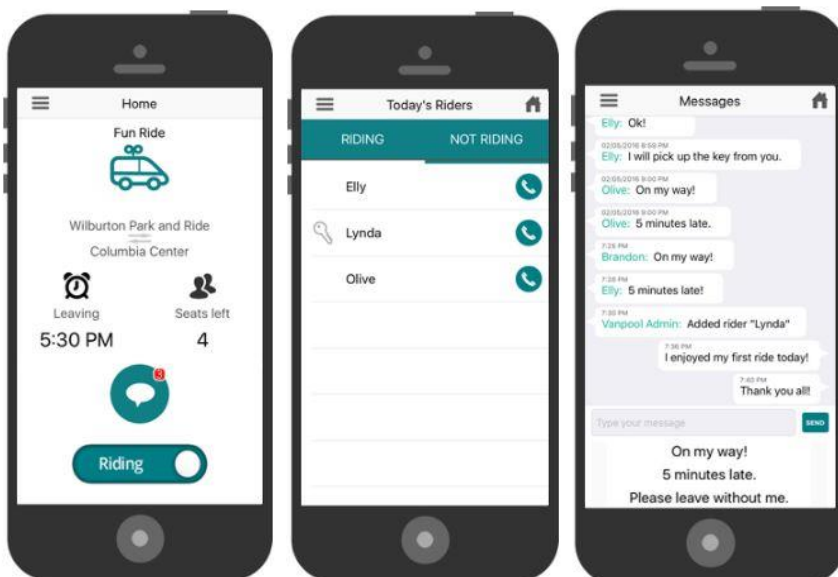


Figure 14: Screenview of Vanpooler App used for King County Metro Transit Vanpool Program
<http://www.vanpooler.com/>

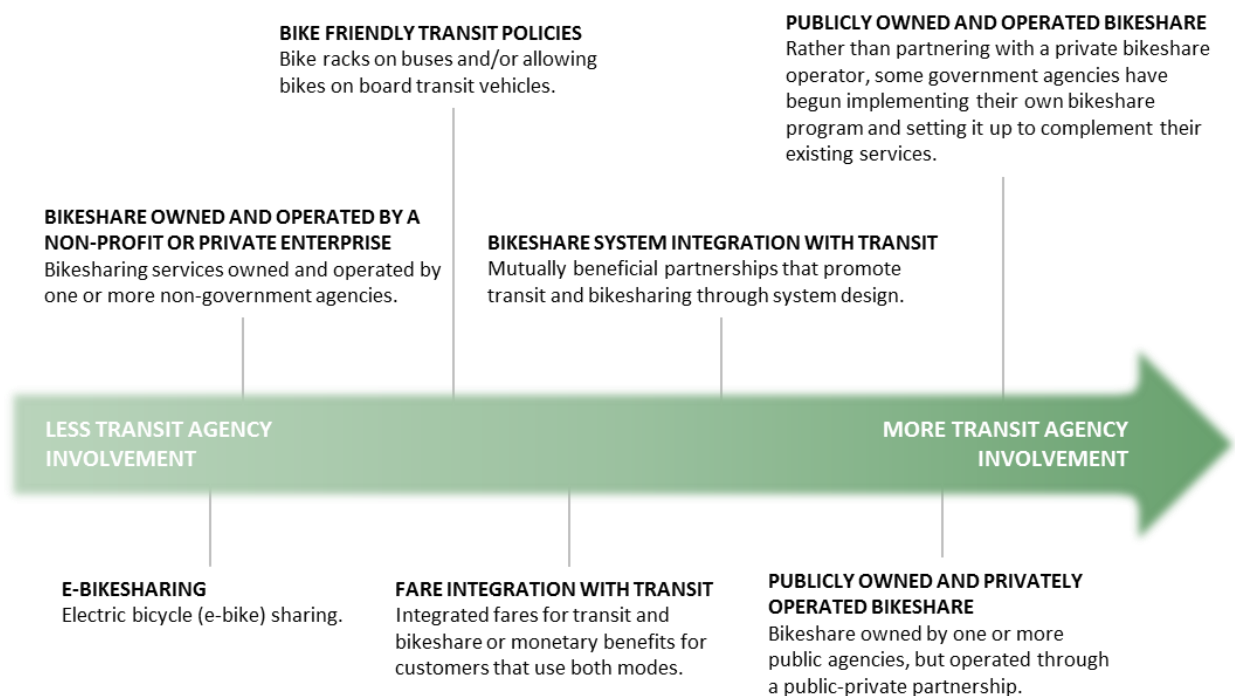
6.4 Bikeshare Services Partnerships

Bikeshare services typically consist of bicycles parked at stations throughout appropriate portions of an urban area. Users access a bike at a station near their trip origin and drop the bike off at a station near their trip destination. Payment is electronic and can be through membership or single use. Bikesharing services are owned and operated by various actors – by public agencies (such as Boise GreenBike in Boise Idaho, Metro Bike Share in Los Angeles, California, and Helsinki City Bike in Helsinki, Finland), non-profit organizations (such as Houston Bike Share in Houston, Texas), private companies (such as Citi Bike in New York City, New York), or combination thereof (such as Bike Share Toronto, in Toronto, Ontario). Some programs use e-bikes instead of standard manual bikes (such as BiciMad in Madrid, Spain).

Bikeshare services can also be promoted by transit agencies through:

- Bike friendly transit policies (such as those of TransLink in Vancouver, British Columbia);
- Fare integration with transit (as offered in Dresden, Germany, Bordeaux, France, and Toronto, Ontario); and
- Bikeshare system integration with transit (such as in Hangzhou, China, Region of Waterloo, Ontario, and Montreal, Quebec).

Examples of bikeshare service partnerships are described in the following sections. The graphic below depicts the transit agency involvement typically required for each type of bikeshare service partnership.



6.4.1 E-Bikesharing

▷ *Electric bicycle (e-bike) sharing*

BICIMAD – MADRID, SPAIN

Electric bikes (e-bikes) provide power assistance to the rider to make it easier to bike at higher speeds or greater distances. Madrid, Spain launched an e-bikesharing program in 2014. It was implemented through a competitive bid process. The winning bid proposed an e-bikesharing program for the same budget as a conventional bikesharing system. Madrid's program has since grown to more than 2,000 e-bikes at 165 docking stations. The e-bikes have a range of 70 km (18 hours) and are limited to a maximum speed of 25 km/h. Prospective customers can get annual memberships or one-day, three-day, or five-day passes. The BiciMad system also has an incentive system to help reduce bunching at high demand stations. Users are given a small credit for taking bikes from a station that is 70% full or if they return the bike to a station that is 30% full or less.

① <https://www.bicimad.com/>

6.4.2 Bikeshare Owned and Operated by a Non-Profit or Private Enterprise

▷ *Bikesharing services owned and operated by one or more non-government agencies.*

CITI BIKE – NEW YORK CITY, NEW YORK, UNITED STATES

Citi Bike is a bikesharing service based in New York City. It is the largest bike share in the U.S., with more than 10,000 bikes and 600 docking stations. Citi Bike was formed through a public-private partnership in 2013 and is currently owned and operated by Motivate, a private bikesharing company. Motivate operates many other bikesharing systems across the world, including Capital Bike Share in Washington D.C and Melbourne Bikeshare in Melbourne, Australia. Citi Bike does not receive any operational subsidies from the City of New York. Prospective customers can purchase one-day passes, three-day passes, or annual membership from kiosks located around the city.

① <https://www.citibikenyc.com>

HOUSTON BIKE SHARE – HOUSTON, TEXAS, UNITED STATES

Houston Bike Share is owned and operated by the non-profit Houston Bicycle. The system currently has 225 bikes and 31 docking stations across Houston, Texas and has plans to add 71 new stations and 568 new bikes. Prospective customers can purchase 24-hour passes, seven-day passes, or annual memberships. Day passes can be purchased using a credit card at any docking station or online. Seven-day passes and annual memberships must be purchased online.

① <https://houston.bcycle.com/>

6.4.3 Bike Friendly Transit Policies

▷ *Bike racks on buses and/or allowing bikes on board transit vehicles.*

BIKES ON TRANSIT – TRANSLINK, VANCOUVER, BRITISH COLUMBIA, CANADA

TransLink currently allows bicycles on its buses, SkyTrain service, SeaBus, and West Coast Express at no added cost to the customer. The policies for each mode of travel include:

- **Bus:** TransLink has bike racks attached to the front of each bus, with a capacity to hold two standard-sized bikes. Folding bikes are also allowed on board at any time if folded.
- **SkyTrain:** The Canada Line allows one bike per car on board at all times and in all directions. This includes electric, standard, and folding bikes. Expo and Millenium Lines allow up to two bikes per car except in the westbound direction Monday-Friday from 7:00-9:00am and in the eastbound direction Monday-Friday from 4:00-6:00pm.
- **SeaBus:** Up to six bikes are allowed on board the SeaBus during rush hours. There is no restriction to the number of bikes on board during off-peak times.
- **West Coast Express:** The West Coast Express allows up to two bikes per car at all times.

① <http://www.translink.ca/en/Rider-Guide/Bikes-on-Transit.aspx>

6.4.4 Fare Integration with Transit

▷ *Integrated fares for transit and bikeshare or monetary benefits for customers that use both modes.*

DRESDNER VERKEHRSBETRIEBE AG (DVB) & SZ-BIKE PARTNERSHIP – DRESDEN, GERMANY

Dresdner Verkehrsbetriebe AG (DVB) is the public transportation provider in Dresden, Germany. Customers with a monthly subscription to DVB can access bikes from any SZ-bike bikesharing station for free for the first 30 minutes and 0.5€ (roughly \$0.70 CAD) for each additional 30 minutes, up to a maximum of 5€ (roughly \$7 CAD) per day. The DVB also offer a combined bus and bikeshare ticket that allows customers to have unlimited public transit and bikeshare for 10€ (roughly \$14 CAD) a day.

① <https://www.dvb.de/en-gb/service-en/cycle-hire/>

V³ – VELOS DE LA COMMUNAUTE DE BORDEAUX, BORDEAUX, FRANCE

V³ is a bikesharing service in Bordeaux, France. It currently has 1,800 bicycles at 166 stations scattered across the city. Many of the stations are located in close proximity to Transports Bordeaux Metropole (TBM) transit stations, which provides convenient transitions between modes. To further promote integration TBM and V³ offer discounted subscriptions to users of both services.

The cost of using V³ is broken up into one time access fees and usage fees based on how long the bike is rented. The usage fee for all riders is free for the first 30 minutes and then 2€ for each additional hour. Table 1 outlines the V³ access fees for various levels of TBM subscribers. V³ also has docking spaces at many transit stations that are available for subscribers that choose to use their on bikes.

Table 1: V³ Access Fees

Program Description	24-Hour Access	7-Day Access	Monthly Access	Yearly Access
Non-TBM Subscriber	1.5 €	7 €	10 €	30 €
Monthly TBM Subscriber	N/A	N/A	7 €	30 €
Annual TBM Subscriber	N/A	N/A	7 €	20 €

i <https://www.infotbm.com/en/bicycles-vcub>

i <https://www.vcub.fr/vcub-service>

PRESTO AND BIKE SHARE – TORONTO, ONTARIO, CANADA

In October 2016 PRESTO and Bike Share Toronto announce a new partnership through which PRESTO users can save 50% on an annual Bike Share Toronto membership. An annual bikeshare membership normally costs \$90 per year. The standard usage fees for Bike Share Toronto still apply. Currently there is no integration between the PRESTO cards and the Bike Share Toronto system; however, this feature could be added in the future.

i <https://www.bikesharetoronto.com/presto>

i <http://www.cambridgetimes.ca/news-story/6836471-toronto-bike-share-offers-discount-to-presto-cardholders/>

6.4.5 Bikeshare System Integration with Transit

▷ *Mutually beneficial partnerships that promote transit and bikesharing through system design.*

PUBLIC BICYCLE – HANGZHOU, CHINA

Hangzhou, China boasts one of the largest bikeshare systems in the world with more than 75,000 bicycles, 2,700 bike stations as of 2014. Around that time the system had an average of 282,000 trips per day. High ridership can largely be attributed to the fact that the first hour of travel is free for all users and stations are strategically located to help complete the first mile and last mile of each trip. Bus users can use their recently activated transit cards to get an additional 30 minutes of the bike rental for free. Approximately 96% of all trips are made for free.



Figure 15: Hangzhou Public Bicycle Station

<http://www.worldwidecyclingatlas.com/initiatives/hangzhou-public-bike-share-scheme/>

- ① <http://www.streetfilms.org/the-biggest-baddest-bike-share-in-the-world-hangzhou-china/> <http://policytransfer.metropolis.org/case-studies/hangzhou-china-urban-public-bicycle-sharing-program>

BIKESHARE AND TRANSIT INTEGRATION – GRAND RIVER TRANSIT, REGION OF WATERLOO, ONTARIO, CANADA

In recognition of the importance of “last mile” multimodal connectivity for transit travel, Region of Waterloo’s TDM Program is working with the local bikeshare provider and Area Municipalities to identify options for enhancing the integration of bikeshare and transit.

Current stakeholders (e.g., Community Access Bikeshare, Area Municipalities) have recognized that the current bikeshare model has limited capacity for expansion and recent advances in bikesharing technology could greatly enhance the value of a region-wide bikeshare network. For instance, GPS-enabled 4th generation bikeshare systems have modular stations that can make use of existing bicycle parking, collect trip data, and incentivize members to “balance” the number of bicycles throughout the system.

The goal of the program is to enhance the local bikeshare program to better serve transit.

The first stage of the proposed plan is to retain a consultant to review existing technologies and assess the feasibility of implementing an enhanced system locally. This could include market demand analysis, service area identification (guided by transit network integration), and options for service delivery. The work is anticipated to be carried out in 2017-2018.

BIXI PARTNERSHIP – SOCIÉTÉ DE TRANSPORT DE MONTRÉAL, MONTRÉAL, QUÉBEC, CANADA

Program Description	The Société de transport de Montréal (STM) has several initiatives that are aimed at facilitating the integration of various transportation modes. One of such initiatives is a partnership with the bikesharing company Bixi. Through this partnership, STM coordinates with Bixi to offer prime bike parking spots near metro stations. They also offer special promotional prices to customers who register for both services. This partnership is supported by other initiatives, such as having bike holders on 8 bus routes, secured bike storage next to metro hubs, and bike racks around most subway stations. A pilot program is currently underway to test the feasibility of using transit smartcards to unlock Bixi bikeshare services.
Implementation	This program was implemented gradually, starting in 2008. It required a formal agreement with Bixi to cover technological and marketing aspects. It is important to note that some of the challenges of offering this service have been overcome or avoided because the STM has a seat on the Board of Directors for Bixi.
Outcome	The number of participants making use of the bike-related services is monitored; however, the STM states it is too soon to interpret results. One thing that is not currently monitored is how many new customers have been gained from the addition of this service. It is something that STM is interested in knowing, but currently does not have the capacity to measure. Overall, public perception and customer reactions have been very positive.
Next Steps	One of the next steps includes looking into mandating the transit smartcard as the one payment method for every partner in the integrated mobility “eco-system”. The STM is also looking into mobile payment technologies, a multi-modal itinerary planner, and real-time transit information.
Keys to Success	<ul style="list-style-type: none"> • A seat on the Board of Directors of Bixi helped facilitate the sharing of information and priorities • Seamless physical integration, integrated pricing, and information centralization made it convenient for new and existing customers • Offering many choices to customers to help suit their individual needs • Top down approach with support from senior management and the mayor
Challenges Faced	<ul style="list-style-type: none"> • Cooperation between multiple (public and private) partners requires many discussions and significant coordination, which can be challenging to manage • Organizations must be open to cooperation for the greater public good – requires a shift from focusing only on individual profit. Business processes must be more transparent and flexible to integrate all partners. • Access to data needed to make informed decisions



Figure 16: STM Integrated Mobility Webpage
<http://www.stm.info/en/info/fares/special-offers/integrated-mobility>

6.4.6 Publicly Owned and Privately Operated Bikeshare

- ▶ *Bikeshare owned by one or more public agencies, but operated through a public-private partnership.*

BIKE SHARE TORONTO – TORONTO, ONTARIO, CANADA

Bike Share Toronto launched in May 2011 with 800 bikes and 80 docking stations spread out across downtown Toronto. It has since expanded its system to more than 2,000 bikes and 200 docking stations.

Bike Share Toronto is owned by the Toronto Parking Authority and operated by Motivate, a private bikesharing operator. Prospective customers can purchase one-day passes or three-day passes from Bike Share Toronto kiosks or through the mobile app. Annual memberships require online registration.

Users can check for available bikes using the third-party Transit App. The app can also be used to plan users' routes to the bikeshare station, purchase a pass, and unlock bikes.

- ① <https://www.bikesharetoronto.com/about>



Figure 17: Transit App Used for Bike Share Toronto

<https://www.bikesharetoronto.com/how-it-works/get-the-app>

6.4.7 Publicly Owned and Operated Bikeshare

- ▶ *Rather than partnering with a private bikeshare operator, some government agencies have begun implementing their own bikeshare program and setting it up to complement their existing services.*

BOISE GREENBIKE – VALLEY REGIONAL TRANSIT, BOISE, IDAHO, UNITED STATES

Boise GreenBike is a publicly owned and operated bikeshare system in Idaho. It is operated by Valley Regional Transit, which is responsible for providing regional transit services in Ada County and Canyon County. Urban centers in this region include Boise, Garden City, Nampa, and Caldwell. The project receives capital funding from federal grants and operational funding from customer revenue, sponsorship, and advertising. Boise GreenBike offers rates hourly, monthly, annual, student-annual, and premium members. Bicycles for the system are supplied by Social Bicycles (SoBi).

- ① <http://boise.greenbike.com/#about>
- ① <http://valleyregionaltransit.org/HOME.aspx>

METRO BIKE SHARE – LOS ANGELES, CALIFORNIA, UNITED STATES

In July 2016, the Los Angeles County Metropolitan Transportation Authority (Metro) launched L.A.'s first bike-share system. The system is owned and operated by Metro and is designed to complement transit. It currently has 1,000 bikes and 65 docking stations across downtown Los Angeles. Over 100,000 trips have been made and 3,000 passes have been sold to date. After registering for the bike share program, current Metro users can link it to their transit account and use their existing public transit card (TAP) to access bikesharing services. The TAP card can also be used to access Breeze Bike Share in Santa Monica. Bicycles for the system are supplied by BCycle. Metro currently offers three service delivery options:

- Walk-up: \$3.50 for every 30 minutes of travel, payable by credit card or debit card at docking station kiosks.
- Flex Pass: \$40 per year and \$1.75 per 30 minutes of travel automatically charged to the credit card or debit card on your account. Bikes can be unlocked by using your TAP card or verifying your ID.
- Monthly Pass: \$20 per month, free travel for the first 30 minutes of each trip, and \$1.75 per 30 minutes after. Payment and bike access are the same as for the flex pass.



Figure 18: Metro Bike Share
<http://www.swellmayde.com/2016/08/my-style-metro-bike-share-in-la.html>

① <http://www.latimes.com/local/lanow/la-me-ln-bikeshare-launch-q-and-a-20160706-snap-story.html>

HELSINKI CITY BIKE – HELSINKI CITY TRANSPORT, HELSINKI, FINLAND

Helsinki City Bike is owned by Helsinki City Transport (HKL) and operated by Helsinki Regional Transit (HSL), the regional transportation provider. As of 2016 City Bike has operated under the same branding as the other mobility services provided by Helsinki Regional Transit. Bicycles are supplied and maintained by a consortium of Smoove and Moventia. In 2016 City Bike had approximately 500 bikes and 50 docking stations across Helsinki. There are plans to increase this to 1,500 bikes and 150 docking stations by the summer of 2017.

HSL offer day passes, week passes, and annual passes. Weekly and annual pass holders must have an account with HSL, which can be completed online. The bikeshare program is fully integrated with other forms of transit. Weekly pass and annual pass holders can opt to use their HRT public transit smartcard to unlock bikes in lieu of a 7-digit cyclist ID pin. Bike share usage fares are automatically charged to the debit or credit card linked to your transit account when you unlock the bike using your public transit card. Use of the HSL card still requires a 4-digit pin for security.



Figure 19: Helsinki City Bike
<http://www.citybikefinland.fi/>

① <https://www.hsl.fi/en/citybikes>

① <http://betterbikeshare.org/2016/07/11/helsinkis-instant-bike-share-boom-shows-potential-integrating-transit/>

6.5 Microtransit Services

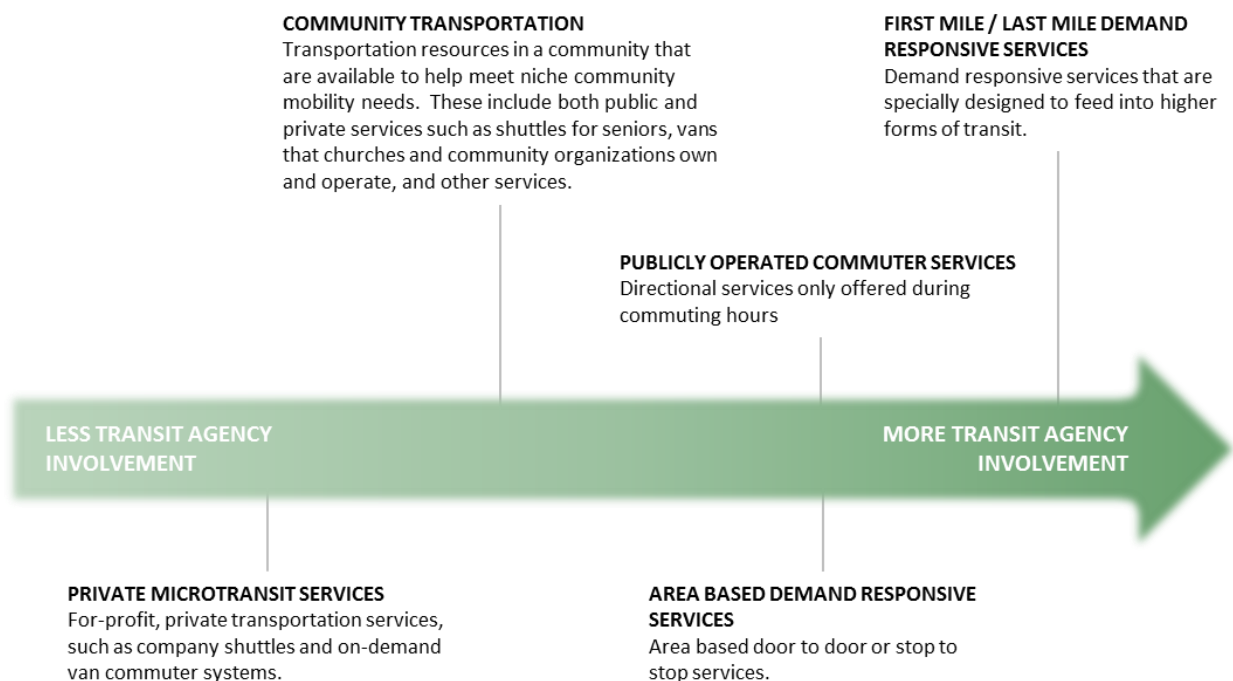
Microtransit is a relatively new term that some use to describe publicly or privately operated transit services which, in many cases, complement or even mirror the operation of conventional public transit services. For the purposes of this toolbox, microtransit refers to the operation of small bus or van services in either a fixed route or demand responsive manner.

Many forms of microtransit have been in place for a number of years, such as:

- Community transportation (such as in Ottawa, Ontario);
- Commuter services (such as the Ride KC:Bridj Pilot in Kansas City, Kansas);
- Area-based demand responsive services (such as Kutsuplus in Helsinki, Finland, and VTA Flex in Santa Clara County, California); and
- First mile / last mile microtransit solutions (such as Milton GO Connect in Milton, Ontario, and Dial-a-Ride transit in Winnipeg, Manitoba and York Region, Ontario).

Other, private forms of microtransit have only recently been conceived and can be considered as emerging. Chariot (operating in the United States) and the Consumers Road Corporate Shuttle (operating in Toronto, Ontario) are examples of privately-operated microtransit services.

Several examples of microtransit services are provided in the following sections. The graphic below outlines the relative level of transit agency involvement typically required for each type of microtransit service.



6.5.1 Private Microtransit Services

- ▶ *For-profit, private transportation services, such as company shuttles and on-demand van commuter systems.*

CHARIOT – UNITED STATES

Chariot is a fixed route vanpool commuter service in San Francisco, California and Austin, Texas. Passengers are picked up from communal stops by 14-seat vehicles called 'chariots'. New routes are added to the system through a multiple step crowdsourcing process. First, Chariot uses origin and destination data to propose new routes. Next, new Chariot users can support the route by reserving a monthly pass. Once the target ridership has been reached, Chariot implements the new route. Since Chariot is primarily targeted at commuters, the service is typically directional and service hours are focussed around the AM and PM peaks. Chariot is currently in the process of being acquired by the Ford Motor Company.



Figure 20: Rider alighting a Chariot

<http://www.sfchronicle.com/business/article/Chariot-to-add-50-vans-increase-shuttle-10643284.php>

① <https://www.chariot.com/about>

CONSUMERS ROAD CORPORATE SHUTTLE – TORONTO, ONTARIO, CANADA

The Consumers Road Corporate Shuttle is a corporate shuttle bus shared by multiple organizations in the Consumers Road Business Park. Employees at participating companies have free unlimited use of the shuttles. The shuttles currently run a loop from Don Mills Subway Station or Fairview Mall down Yorkland Boulevard, then Consumers Road, and back along Sheppard Avenue (approximately 3.5km). Approximately 16 runs are conducted throughout the day, focused around the morning commute hours, lunch, and evening commute hours.

The business park is also served by one Toronto Transit Commission (TTC) bus route and bordered by others

① <http://smartcommute.ca/north-toronto-vaughan/get-me-there/consumersshuttle/>.

6.5.2 Community Transportation

- ▶ *Transportation resources in a community that are available to help meet niche community mobility needs. These include both public and private services such as shuttles for seniors, vans that churches and community organizations own and operate, and other services.*

COMMUNITY TRANSPORTATION PARTNERSHIP, RURAL COMMUNITY SUPPORT SERVICES – OTTAWA, ONTARIO, CANADA

<p>Program Description</p>	<p>The City of Ottawa allocates funding to three local community support agencies to help fund the cost of providing transportation services to rural residents. Seniors and adults with a physical disability can arrange for rides to scheduled appointments via passenger vans or with volunteers using their own vehicle.</p> <p>The goal of the program is to enable community support services agencies to augment the rural transportation services they provide to seniors and persons with disabilities.</p>
<p>Implementation</p>	<p>On November 7, 2007, the Seniors Advisory Committee (SAC) presented a report entitled Transportation Parity for Seniors and People with Disabilities in Rural Areas (ACS2007-CCV-SAC-0003) to the former Transit Committee. The Committee directed staff to review the issue of parity for rural seniors and people with disabilities, and that staff review the pre-amalgamation practice of purchasing service from a local community resource centre. This led to the implementation of the community transportation partnership – rural community support services on April 1st, 2012.</p> <p>The City of Ottawa – Transportation Service – OC Transpo is currently partnered with three community support services agencies: Western Ottawa Community Resource Centre, Rural Ottawa South Support Service and Eastern Ottawa Resource Centre. Formal agreements between the City of Ottawa and the three community support services agencies are in place. The agreement stipulates a certain amount of funds to be provided to the agencies. The agencies must use the funds for specific purposes identified in the agreement, such as activities related to the personnel required to initiate augmented transportation programs and to operate/maintain/provide transportation services.</p> <p>The funding for this program was transferred from the Transit Services budget. Simultaneously, the responsibility for trips between two rural locations was transferred to the community support service agencies. Para Transit service became only available for trips from the rural area into the urban area or from the urban area to the rural area.</p>
<p>Outcome</p>	<p>The partnership has enabled more rural trips for seniors and people with disabilities to be provided, and at a lower cost. Reports are prepared to monitor the continued success of the agreement. Quarterly reports are provided by the agencies, documenting total trips and unique clients carried as a result of the funding. Annual reports are also prepared by the agencies, outlining the value of the overall transportation services provided and the value of the funding contribution for the users of the service. The City of Ottawa stated that the program has not been challenging to manage.</p>
<p>Next Steps</p>	<p>Plans are for the program to continue. Additional funding could allow some form of program expansion.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Ongoing and open communication between both parties as well as providing flexibility to the agencies to operate as they see fit.
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • Obtaining consistent data from all three agencies in order to track the results of the partnership.

6.5.3 Publicly Operated Commuter Services

▷ *Directional services only offered during commuting hours*

RIDE KC: BRIDJ – KANSAS CITY AREA TRANSPORTATION AUTHORITY, KANSAS CITY, KANSAS, UNITED STATES

Bridj, KCATA, and Ford recently partnered to provide improved mobility within several neighbourhoods in the Kansas City area, supplementing regular transit services. Bridj provided the scheduling/routing software, KCATA supplied the drivers and manages operations, and Ford supplied locally-built, 14-seat vans. Bridj routes were fixed and operated on demand. New routes were formed and existing routes were modified using algorithms that sift through transit data, social media, and requests for service on the mobile Bridj app. Bridj shut down in early 2017.

The pilot was targeted at commuters. Trips were only allowed within and between three service areas. All trips began and ended at “pop up stations” within a 5-minute walk of the customer’s origin and destination.

Fares during the pilot were \$1.50, which matches the existing regular transit fare. Customers booked trips and paid fares via the Bridj smartphone app. The fares were then recovered by KCATA and Bridj was paid on a per hour basis, per vehicle in operation. Only locally available funds were used to run the pilot (i.e. no federal funding).

KCATA drivers were hired under a new seniority unit within the CBA specific to microtransit. Emphasis was placed on hiring drivers with a background in the hospitality industry.

Prior to the pilot, the KCATA planning team did extensive planning and research on the type of service they wanted to provide and potential partnerships to provide said service. After selecting Bridj as their software provider, the KCATA and Bridj worked together to identify target areas for the pilot. The goal of the pilot was to test out an alternative service delivery model and attract new types of riders to use public transit.

The pilot launched in early 2016 and operated for approximately one year. It started with two service areas and has since been expanded to a third area based on user requests.

Customers view it as higher end service than traditional transit. Higher earners were more commonly observed using the service because they have a better understanding of how the service works. Businesses are jumping on board to handle parking issues, and employers are willing to subsidize.

A new procurement process came out of this, avoiding federal funds and allowing for sole source rather than request for proposal.



Figure 21: Ride KC: Bridj Vehicle

<https://media.ford.com/content/fordmedia/fna/us/en/news/2016/02/11/bridj-kansas-city-ford-urban-mobility.html>

6.5.4 Area Based Demand Responsive Services

- ▶ *Area based door to door or stop to stop services.*

KUTSUPLUS – HELSINKI, FINLAND

Kutsuplus was an on-demand mini bus service that operated in Helsinki between 2012 and 2015. The service utilized user input from a smartphone-based app to build optimized routes in real time. Service was available within a 100 square kilometre area in and around Helsinki. The dispatch system was developed by AJELO and vehicles were managed by the City of Helsinki. Local municipalities provided an 80% subsidy to make it economically competitive with other modes. The service terminated in 2015 after being deemed economically unsustainable. One of the major issues was the inability to compete with Uber, particularly due to the cost of drivers.

- ① <https://www.hsl.fi/en/news/2016/final-report-kutsuplus-trial-work-develop-ride-pooling-worth-continuing-8568>
- ① https://www.hsl.fi/sites/default/files/uploads/8_2016_kutsuplus_finalreport_english.pdf



Figure 22: Kutsuplus App and Vehicle

<http://sharedusemobilitycenter.org/news/killed-kutsuplus-3-takeaways-cities-pursing-mobility-demand/>

VTA FLEX – SANTA CLARA VALLEY TRANSPORTATION AUTHORITY, SANTA CLARA COUNTY, CALIFORNIA, UNITED STATES

Program Description	<p>The VTA Flex program was a dynamic transit service pilot that used software developed by RideCell to create dynamic routes between designated communal bus stops based on user trip requests in real time. During the pilot drivers were provided step-by-step directions to get to the next communal stop via a mounted iPad in the vehicle. Instructions on how to get to the next pickup or drop off location were only provided once the current pickup or drop off was complete.</p> <p>The maximum walking distance to communal stops was 400m and the average walking distance was 200m. Additionally, the maximum ride time was set to 15 minutes on board the shuttle bus to avoid the vehicle picking up too many people between someone's origin and destination.</p> <p>Customers were allowed to go from any stop to any stop rather than just providing connections to LRT. The VTA started the pilot with a 3 square mile area around the local LRT stations. People that were riding it at first were doing point to point. The VTA only captured the LRT connection trips once the service area was expanded to a 6 square mile area.</p> <p>The fare was \$3.00 during the AM and PM peak and \$2.00 during off peak times.</p>
Implementation	<p>The VTA Flex program stemmed from a few businesses challenges that the VTA wanted to address, including first mile/last mile issues and having a service that could run without fixed route fixed schedule. They also wanted to focus on helping suburban areas where fixed routes were not cost effective and aim to help meet the high demand at heavy rail and light rail stations, which had parking capacity issues.</p> <p>The program started in late 2014 when the VTA got approval to try a dynamic transit model. The VTA put out a RFP to get the software to do the dispatch and the customer interface in 2015. Santa Clara VTA worked with RideCell over 4-5 months to customize their software to the local context and then ran the pilot for six months.</p>
Outcome	<p>The pilot was considered a success because the software functioned well and there was high customer satisfaction and approval. It was not successful from with respect to cost and the VTA hopes that future pilots could be used to make the service economically sustainable in the long term.</p>
Next Steps	<p>If the pilot is revisited, some of the possible changes could be having specific vehicles that are only used for advanced reservations and expanding the service area.</p>
Keys to Success	<ul style="list-style-type: none"> • Ridecell's software was very good • Customers were very accommodating because they understood it was a pilot and that some of the kinks needed to be worked out
Challenges Faced	<ul style="list-style-type: none"> • The original concept was very open ended and the project planning team found it hard to come to an agreement with respect to various aspects of the service • Could not reliably provide both real-time and advance bookings • Vehicle size was too large. They never fully utilized the capacity and the vehicle size hindered maneuverability which limited where the vehicles could go and where stops could be placed. • Sometimes the software would tell customers to go to a further stop to make the vehicle trip faster. This required public education to explain. Before customers understood this they would cancel the trip thinking that they were being sent to the wrong place. • Having communal bus stops made it hard to expand the service area because the VTA had to select appropriate stop locations and go out and label the stops. They were only able to expand on a quarterly basis because new stops had to be approved and they had to train the operators. • The VTA underestimated marketing costs. They needed to spend a lot of money to communicate this service to the public and get people to use it. • Future pilot should be a minimum of a year to see maturity in ridership. Six months was not enough time to grow ridership to realistic levels for use in decision making and proper evaluation of the service delivery model. • There were issues with GPS accuracy. The VTA had to install GPS antennae on top of the buses and use dual cell coverage to accurately monitor the locations of the buses and develop routes.

6.5.5 First Mile / Last Mile Demand Responsive Services

▷ *Demand responsive services that are specially designed to feed into higher forms of transit.*

MILTON GO CONNECT – MILTON, ONTARIO, CANADA

Milton GO Connect was a one-year pilot to evaluate a first mile, last mile service to and from GO Transit stations in Milton, Ontario. The service ran from May 2015 until April 2016. One of the impetuses for the pilot was the lack of coordination between local transit service and GO Train arrivals/departures due to the variability of GO Train schedules. This resulted in some customers waiting up to 20 minutes for a connection between services.

The pilot service utilized shuttles operating on dynamic routes that were formed in real-time based on pickup and drop-off requests. Customers could use a smartphone app to arrange for a local transit pickup based on the GO Train arrival or departure time. Customers were charged a small fare premium for the direct connection to the GO Train and an additional fare premium if they wanted a pick-up or drop off directly in front of their house instead of at a communal stop.

① <https://www.milton.ca/MeetingDocuments/Council/agendas2016/rpts2016/ENG-003-16%20Dynamic%20Transit%20Pilot%20Project%20final.pdf>

DIAL-A-RIDE TRANSIT (DART) – WINNIPEG TRANSIT, WINNIPEG, MANITOBA, CANADA

Program Description	<p>DART is a demand-responsive service operated in low density areas during periods of low demand. In areas it operates, DART replaces conventional fixed route service to provide service on demand when and where required. In each area, a 30-foot transit bus is used for service delivery. The DART bus has scheduled connections with a mainline route at the edge of the service area (usually at a regional shopping centre). Outbound passengers transferring from the mainline service and destined to the service area inform the DART operator of their destinations upon boarding. The operator then plans a route to deliver passengers to their destinations so that overall travel time is minimized for all passengers. Passengers are dropped off at the nearest intersection. Passengers wishing to travel from their homes must book trips by calling the DART operator (who is equipped with a mobile phone) to provide origin, destination, and desired time of travel. The bus operator then fits the trip into his hourly vehicle tour. Trip reservations are made about 30 minutes prior the pick-up time. Because pick-up times are approximate, passengers are picked up at their homes. Regular transit fares apply to DART service.</p>
Implementation	<p>Two DART services were implemented on a trial basis in 1996. Following a successful trial, the services were made permanent. Four additional DART services were implemented in the late 1990's and early 2000's. Two of the additional services were successful and continue to operate. In the other two areas, ridership declined and fixed route services were reinstated. Of the four DART services that have continued to operate, three operate in low-density suburban areas during weekday evenings and throughout the day on weekends. The fourth DART service operates in the central part of the city (where there is a high concentration of seniors) during the midday on weekdays and during the morning/afternoon on Saturdays.</p>
Outcome	<p>DART has successfully operated during all weather conditions and is popular with both passengers and operators. Ridership levels are comparable to those of the fixed-route services that were replaced. The conversion of fixed-route service to DART does not necessarily result in costs savings. Because DART can service a much larger geographical area, improvements in cost-effectiveness have resulted. The flexibility of DART operation means that passengers travelling to/from areas out-of-reach of fixed-route transit can be served. Experience has shown that DART is operationally feasible for ridership levels up to 12 boardings/bus hour. Demand levels during early weekday/Saturday evenings were too high for DART on one of the services; fixed-route service was reinstated until 22:00 with a transition to DART for the remainder of the service day. The two unsuccessful DART services operated during the midday on weekdays and, as they did not appreciably reduce walking distances and required a high proportion of passengers to pre-book their trips, a loss in ridership resulted. The former fixed-route services in these two areas were subsequently reinstated.</p>
Next Steps	<p>While DART is considered for other low-density areas, the current priority is to implement a mobile app that allows for improved booking for passengers and for automated assist to operators for route and schedule planning for pick-ups and drop-offs.</p>
Keys to Success	<ul style="list-style-type: none"> • Operator training • Effective public communications on how the service works • Integrated fare system with conventional transit
Challenges Faced	<ul style="list-style-type: none"> • Finding a suitable vehicle (ideally a low-floor kneeling bus, with a short turning radius) to operate on residential streets • Finding suitable locations for DART pick-up, drop-off locations

LOW DEMAND SERVICES – YORK REGION TRANSIT/VIVA, YORK REGION, ONTARIO, CANADA

<p>Program Description</p>	<p>The Regional Municipality of York’s Low Demand Services program utilizes extra paratransit capacity to supply an on-demand service in areas without conventional service and replace conventional routes in low demand areas. It operates as dial-a-ride system, requiring users to phone in to the call centre and request a pickup at least 30 minutes in advance. A mobile application called TapRide is being piloted as an alternative way to book trips for the dial-a-ride service. The goal of the program is to help address first mile and last mile issues by connecting residents to YRT’s conventional services and implement a more economically sustainable service model in low demand areas. Customers are allowed to make both same day bookings and subscription trips.</p>
<p>Implementation</p>	<p>Low demand services first began as a dial-a-ride service in 2015. In 2016, YRT began piloting the TapRide mobile application as a way for customers to book trips using their smartphones. The programmed stemmed from two primary factors:</p> <ul style="list-style-type: none"> • pressure from elected officials to increase operational efficiencies; and • excess capacity on paratransit services that resulted from maintaining compliance with AODA requirements. <p>Implementing the service required communication with the operating contractors and an RFP was issued for on-demand services.</p>
<p>Outcome</p>	<p>The program has been successfully implemented in several areas. Routes that were targeted for replacement with this service had less than 10 passengers per hour; however, YRT has not set a formal target that would trigger replacing a conventional route with on-demand coverage.</p>
<p>Next Steps</p>	<p>YRT is currently piloting the TapRide mobile app as a way to book trips using a smartphone. They are currently working with RouteMatch to integrate on-demand bookings with conventional services. Eventually YRT aims to have all of their services within one application.</p>
<p>Keys to Success</p>	<ul style="list-style-type: none"> • Using extra capacity in an innovative way
<p>Challenges Faced</p>	<ul style="list-style-type: none"> • According to current Ontario regulations, passengers that bring small children require car seats that are secured in YRT’s minivans. To get around this requirement, YRT has a few 26 ft. buses that it sends upon being notified of a trip request with small children. • YRT has found that there are accuracy issues with its automatic passenger counters. These issues make it difficult to identify routes that are underperforming and would benefit from being converted to on-demand service. • YRT is unsure of what type of model they want to provide for the on-demand service. There are benefits of having stop to stop service and curb to curb service. Each situation is different and there is no “one size fits all” solution.

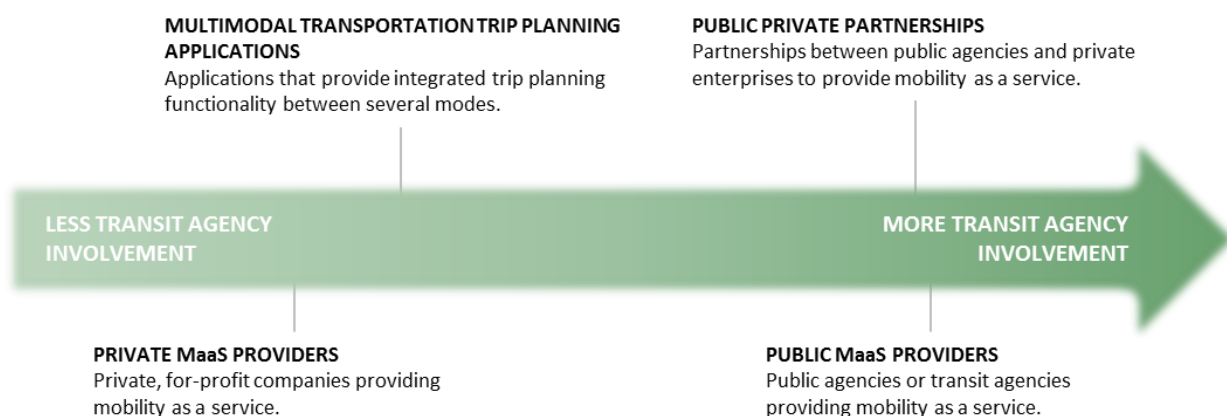
6.6 Mobility-as-a-Service Models

Also known as Transportation-as-a-Service, Mobility-as-a-Service (MaaS) describes a shift away from personally owned modes of transportation and towards mobility solutions that are consumed as a service. MaaS typically requires some type of transportation/mobility aggregator to bring together all of the mobility options and approaches within a community (public transit, bikeshare, carshare, rideshare, microtransit) and provide an integrated platform for users to plan trips, monitor progress, and pay for the services used (either through a subscription package or as an individual trip). The implementation of MaaS is only just emerging, but there are already various partnership models.

In some cases, MaaS is provided by a private enterprise/organization, as is the case with Ford Smart Mobility in the United States. In other cases, MaaS is provided by a public entity, as is the case with the Family of Services approach in York Region, Ontario. In other cases, MaaS is provided through a partnership between a private enterprise/organization and a public entity. This is the case with Whim in Helsinki Region, Finland, The Total Travel in Denmark, and SMILE in Vienna, Austria.

MaaS can also be approached by integrating trip planning across all modes into one single application, such as Moovit.

Examples of MaaS models are summarized in the sections following. The graphic below outlines the relative level of transit agency involvement required for each.



6.6.1 Private MaaS Providers

▷ *Private, for-profit companies providing mobility as a service.*

FORD SMART MOBILITY LLC – UNITED STATES

Ford is in the process of developing a suite of mobility services that can all be accessed through a single app called FordPass. Currently this app is capable of scheduling service appointments for a private vehicle, remotely starting a vehicle at a scheduled time, reviewing vehicle information, and identifying, reserving, and paying for parking at select locations. Services that could eventually be included in this app are:

- Chariot: a crowdsourced commuter shuttle service that develops new routes based on demand that was recently purchased by Ford
- Ford GoBikes: a bikesharing initiative being developed with the assistance of bikesharing company, Motivate
- GoDrive: a one-way car share service with reserved parking at your destination currently being piloted in London, UK

① https://www.fordpass.com/en_us/marketplace.html

① <http://www.theverge.com/2016/9/9/12861632/ford-shuttle-bus-bikeshare-chariot-motivate-san-francisco>

① <http://www.theverge.com/2015/5/26/8659553/ford-godrive-car-sharing-london>

6.6.2 Multimodal Transportation Trip Planning Applications

▷ *Applications that provide integrated trip planning functionality between several modes.*

MOOVIT – WORLDWIDE

Moovit is one of many emerging multimodal trip planning applications that leverages open source data from public transportation providers. After the user inputs origin, destination, and time of departure, the application uses available scheduling data and user preferences to develop multiple trip suggestions from which the user can choose. Moovit is currently available in over 1,200 cities, across more than 70 countries. The app is not currently capable of reserving or paying for trips.

① <https://www.company.moovitapp.com/>

6.6.3 Public Private Partnerships

▷ *Partnerships between public agencies and private enterprises to provide mobility as a service.*

WHIM – HELSINKI REGION, FINLAND

Whim is a Mobility as a Service (MaaS) app that helps users plan their trips by analyzing all locally available transportation modes in a single platform. In addition to trip planning, Whim is capable of managing tickets and paying for each service. The Whim app can be paid for on a subscription basis or pay as you go. Using the subscription based method gives you access to unlimited rides on HSL Helsinki public transport and a specified amount of “Whim points” that can be spent on various other modes, such as car rentals, taxis, etc. Whim also has the capability of integrating with electronic calendars to help plan trips in advance and save user preferences.

On June 13, 2016 Whim unveiled its Mobility as a Service (MaaS) app. A pilot of the service started in Fall 2016 and is currently limited to the Helsinki region in Finland. The major transport providers in the program are HSL Helsinki Region Transport, taxi companies, Sixt car rentals, and Veho.

- ① <http://maas.global/whim/>
- ① <https://whimapp.com/fi-en/>

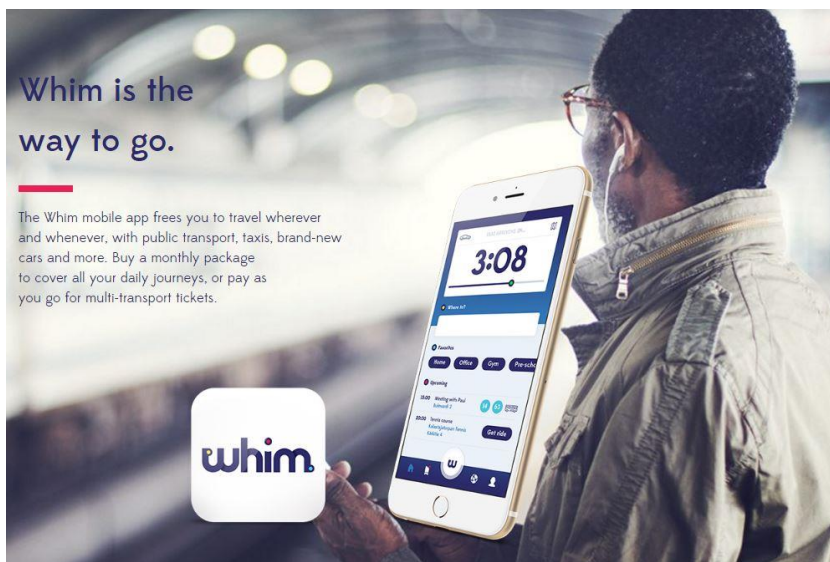


Figure 23: Whim App
<https://whimapp.com/fi-en/>

“THE TOTAL TRAVEL” – DENMARK

Denmark is taking a new approach to managing public transport in rural regions. From 2013 to 2018, all on-demand trip requests in the pilot area are being sent to a central dispatcher which then assigns operators to complete the trip. Named “The Total Travel”, this pilot project enables users to have one ticket and one payment method for an entire trip even if they transfer between services. Vehicles are selected by the dispatcher to match the demand and conventional public transit services are leveraged wherever possible.

- ① <https://www.flexdanmark.dk/web/flextrafik/den-samlede-rejse>
- ① <http://www.citylab.com/commute/2015/04/how-the-microtransit-movement-is-changing-urban-mobility/391565/>

SMILE – VIENNA, AUSTRIA

The SMILE pilot project in Vienna is one of the world's first MaaS pilots. Using software developed by Fluidtime, customers could plan, reserve, and pay for multimodal trips through a single platform. The app generated multiple trip suggestions based on user preferences and integrated scheduling data. Users could select the option that best suited their needs and book the trip directly through the app. User preferences such as car share memberships and maximum walking distance, could be saved in the app to help with future trip planning. The pilot had approximately 1,000 users and ran from May 2014 to May 2015. Service providers involved in the project were:

- Public Transport: Wiener Linien, ÖBB, Linz Linien
- Ferry: TwinCity Liner Wien - Bratislava
- Taxi: 31300
- (e-)Bike-Sharing: Citybike Wien, nextbike, Grazbike
- (e-)Carsharing: car2go, Flinkser, EMIL, emorail, e-Carage
- Parking: Wipark, Wien Energie Tanke, Energie Steiermark, Parkgaragen Elbl

① <http://www.traffictechnologytoday.com/news.php?NewsID=83379>

① <http://sharedusemobilitycenter.org/news/three-european-cities-making-on-demand-mobility-a-reality/>

① http://smile-einfachmobil.at/index_en.html

6.6.4 Public MaaS Providers

▷ *Public agencies or transit agencies providing mobility as a service.*

FAMILY OF SERVICES – YORK REGION TRANSIT/VIVA, YORK REGION, ONTARIO, CANADA

Program Description	<p>York Region Transit's (YRT) Family of Services initiative utilizes conventional service to accommodate portions of paratransit trips where there is existing fixed route service. This helps the YRT provide better service to its paratransit customers for the same cost.</p> <p>The Family of Services process starts after a trip request has been received. YRT software analyzes each trip request to identify trips that have enough overlap with existing service to benefit from a transfer (based on travel time savings). In each case, Mobility Plus is used as a first mile and last mile service, with conventional service in between. First time users and users that are not comfortable using the Family of Services initiative are provided travel training, which includes waiting with the customer at the hub and helping them transfer onto conventional services. Separate fares must be paid to each agency in cases where customers transfer to a different service provider. YRT's Family of Services is available to both ambulant customers and people that require mobility aids.</p>
Implementation	<p>The Family of Services was first introduced in 2008 in response to a known issue that many paratransit customers were using paratransit to complete long trips across areas that were already serviced by YRT's conventional service. In some of these cases the paratransit customers could use conventional services for all or part of their trip, but were opting not to for various reasons.</p> <p>YRT/Viva partnered with contractors, and sent out communications to various groups. YRT/Viva communicated to other programs, sent out communications to paratransit users, and sent communications to TTC (Wheeltrans) allowing York Region to use TTC infrastructure for transfers.</p> <p>Implementing the Family of Services initiative required changes to the YRT's scheduling software. In particular, the YRT needed to be able to identify eligible trips for the service and integrate paratransit scheduling with its conventional service.</p> <p>At first there was pushback from the paratransit contractors regarding the initiative. They were concerned it would reduce paratransit usage by eliminating many of the long paratransit trips. However, integrating with conventional services replaced these trips with many shorter trips, which helped the paratransit contractors by reducing deadheading.</p>
Outcome	<p>The program has been a great success. YRT has seen a 9% growth in ridership within the same budget. Additionally, the average trip length using paratransit services was reduced from 11 km to 7 km. YRT hopes to reduce this to under 6 km per trip as more paratransit customers become familiar with the Family of Services initiative.</p> <p>Performance of the program is reported quarterly. YRT uses metric such as cost per trip, average trip length, call centre stats, number of km transferred to conventional, number of people travelled trained, and ridership to analyze the performance.</p> <p>Based on the 2016 data, approximately 15% of all trips are completed using the Family of Services, with 60 travel training sessions per month, and 1,000 Family of Services trips per month.</p> <p>Customers are largely in favour the program. There was some apprehension from existing paratransit users at the beginning, but most people have grown to like the program.</p>
Next Steps	<p>YRT plans to continue building on the program's success.</p>
Keys to Success	<ul style="list-style-type: none"> • Communication with elected officials who would often receive complaints • Communication with paratransit customers, newsletters, brochures • Council is supportive and encourage them to try these things • Important to have one-on-one training and repeat training for those that are uncomfortable.
Challenges Faced	<ul style="list-style-type: none"> • Getting over the apprehension of customers trying a new service • Conventional passengers concerned about delays at beginning.



7.0

Moving Forward

This Toolbox provides transit agencies with examples of various integrated mobility initiatives and solutions. It is not intended to be an exhaustive list of integrated mobility initiatives worldwide, but rather an example of the wide variety of service types and solutions that can advance the state of integrated mobility within communities.

Transit agencies are reminded that not every initiative will be applicable in every community, and encouraged to consider those initiatives that are most feasible.

The review of current examples unlocked several **“keys to success”**, learned by other agencies working towards integrated mobility. These insights can be taken into consideration by all municipalities looking to advance integrated mobility within their communities.

First and foremost, focus on the user. Place the user at the centre of the discussion. Understand and meet the user’s needs. Consult as needed. Ultimately, the success of any initiative depends on user adoption and opinion, and it is therefore critical to provide solutions that meet users’ needs.

Define goals and objectives, at all levels of the agency. Before any work is done, transit agencies must clearly define the focus and intent of their work. This is essential to ensure that all parties are working towards the same ultimate objective, and that all initiatives work together to achieve a unified objective. Goal-setting should be completed with participation from all levels of the agency. Management must be “on board” to provide support and direction.

Encourage innovation beyond the comfort zone. The “we’ve always done it this way” attitude will not work. Moving forward requires new ideas and changed policies. Transit agencies must accept this and embrace getting out of their comfort zone before beginning to discuss potential initiatives.

Have the right people. Just as all endeavours should work towards the same goals and objectives, all employees should work towards the same end vision. Promoting “champions for change” can be an effective strategy to ensure there is continuous attention devoted to advancing new initiatives.

Make partnerships true partnerships. Integrated mobility ultimately requires partnerships with other groups – other government departments, mobility providers, and modes. These partnerships should be true partnerships in the sense that they are founded on transparency, and offer a win-win outcome benefitting both partners.

Communication is critical. Communication to all parties must be clear, open, and timely. Customers, partners, employees, and decision-makers must all be informed with care. Proactive communication and marketing can help to garner support for an initiative before it is implemented, increasing its chance of success.

Training improves understanding, adoption, and ultimate use of the system. Internal training for employees will further their understanding of the system, allowing them to provide better information to customers. It will also incorporate them into the process of continual system improvement, making them part of future solutions. External training for all users of all abilities will improve comfort levels with recent changes and in doing so, encourage use of the system.

Perfection on the first try is challenging; try pilots instead. Pilot projects can offer highly valuable feedback on an initiative, and can allow municipalities and agencies to “test-run” their ideas in a low-risk environment. Feedback from the pilot project should be used to tailor the permanent initiative to better meet customers’ needs.

Integration should be seamless. Integrated mobility cannot be achieved if the user experience is complicated in any way. Integration between modes and services must be seamless, efficient, and easy from all perspectives – physical, informational, and pricing/payment systems.

Persist, persist, persist. Changing the status quo is no small feat, especially when placed on top of daily operations. Transit agencies must be prepared to face many challenges while working towards integrated mobility, many of which cannot be anticipated. Agencies must be willing to persist and work through these challenges to attain their desired objectives, and achieve integrated mobility within their communities.



Key References

Several documents are listed below as key references on the topic of integrated mobility. It is noted that these reflect key references at the current time, and that key reference sources may change over time as new developments occur in the field of integrated mobility.

Key References on Integrated Mobility

- Transportation Research Board (TRB) Special Report 319: *Between Public and Private Mobility: Examining the Rise of Technology-Enabled Transportation Services*
- Transit Cooperative Research Program (TCRP) Report 188: *Shared Mobility and the Transformation of Public Transit*
- Shared Use Mobility Centre – www.sharedusemobilitycenter.org
- Innovative Mobility Research: www.innovativemobility.org
- Union Internationale des Transports Publics (UITP) Policy Brief: *Public transport at the heart of the integrated mobility solution*
- National Association of City Transportation Officials: *Urban Street Design Guide; Transit Street Design Guide; Urban Bikeway Design Guide*
- International Transport Forum: *Shared Mobility – Innovation for Liveable Cities*
- US Department of Transportation, Federal Highway Administration: *Shared Mobility – Current Practices and Guiding Principles*
- Victoria Transport Policy Institute: Online TDM Encyclopedia, www.vtppi.org/tdm/
- Transport Canada: *Transportation Demand Management for Canadian Communities: A Guide to Understanding, Planning and Delivering TDM Programs*

