



# NEW MOBILITY TECHNOLOGY IN THE DRIVER'S SEAT



Credit: Société de transport de Laval

Canada's urban population will continue to grow over the coming years, and solutions are needed to ensure that each new resident does not result in an additional car added to our roads. Our transportation systems would not be able to sustain this. Unfortunately, building more roads, or widening them further, only postpones this problem.

For Canadian transit systems, the real challenge lies elsewhere. Public transit will need to adapt to new expectations from customers as new technologies, like autonomous vehicles (AVs) and on-demand technologies, are fundamentally changing the way commuters plan their trips.<sup>a</sup>

## AUTONOMOUS VEHICLES AND SHARED MOBILITY

Isn't it frustrating when you're stuck in traffic and you realize that there is only one person, surrounded by empty seats, in each of the cars around you? Wouldn't it be more efficient to move some of these drivers into the cars next to them, eliminating more than half the vehicles from the road and getting everyone to where they need to go faster and more efficiently?

Single-occupancy vehicles (SOVs) are one of the main causes of traffic congestion. The new risk we face, with the arrival of AVs, is that our cities will begin to add vehicles to the roads with no passengers inside them. This is why Canada must adopt regulations that encourage shared mobility.

According to Statistics Canada, the vast majority of Canadians currently commute to work in SOVs. Replacing SOVs with AVs will not solve the central issue facing cities: a lack of space on the roads. A vehicle takes up the same amount of space on the road regardless of the number of occupants it has.

In the future, if a large number of AVs drop off their passengers for work in the morning and drive away afterwards, there would be two morning traffic jams: one on the way into the city, and another on the way out.

This problem cannot be solved without AV regulations that explicitly encourage shared mobility. Having more than one person per AV makes for more efficient use of both our vehicles and our limited road space. For instance, a high-occupancy vehicle (HOV) lane moves 1.5 times more people than a general traffic lane.<sup>b</sup>

AVs are not yet a reality on our roads, but could be soon. Vehicles with automated steering and braking/acceleration functions (automation levels 1 and 2 on a scale of 5) are already available.<sup>c</sup> Companies like Uber and Google are currently testing automated car prototypes, and the Canadian government has begun consultations on the regulatory framework that should be adopted.

While it is difficult to predict when consumers will be able to start purchasing fully autonomous vehicles, experts generally agree that AVs will first be deployed in controlled environments. Transit systems already operate automated systems in controlled environments, like Vancouver's SkyTrain.

## WESTERN CANADA PILOTS DRIVERLESS SHUTTLE

In September 2018, Pacific Western Transportation (PWT) tested an electric autonomous shuttle called ELA over a one-kilometre distance between the Telus Spark science museum and the Calgary Zoo. The shuttle had a 12-passenger capacity and ran at 12 km/h in designated lanes closed to other vehicles, pedestrians and bicycles for 22 days. Following the experiment in Calgary, the pilot moved to Edmonton, Surrey and Vancouver for further testing.

## ANSWERING COMMUTER NEEDS WITH ON-DEMAND MOBILITY

Mobile apps used by transportation network companies (TNCs), like Uber and Lyft, have completely changed the way people think about mobility. All it takes is a few clicks on a smartphone to get around. But this technological advance could have the unfortunate effect of encouraging individual travel rather than shared mobility.<sup>d</sup>

Some studies show that TNCs are aggravating traffic congestion in North American cities because they are adding vehicles on the road. Studies also show that some users are turning away from public transit.<sup>e</sup>

On the other hand, carpooling apps, such as Netlift, do not create additional trips as they provide carpool rides for trips that are already being taken.



Credit: Pacific Western



Credit: Société de transport de Montréal (STM)

Public transit remains the best way to transport large numbers of people through a limited amount of space. Buses can move 15 times more people than a car. <sup>f</sup> In the case of a streetcar, the flow is equivalent to a three-lane highway, or 7,500 riders per hour, and requires 10 times fewer rights-of-way. <sup>g</sup>

A study by the University of Toronto for CUTA <sup>h</sup> shows that frequency is one of the key determinants of ridership growth. A high concentration of single-family homes in a neighbourhood, on the other hand, leads to a decrease in transit ridership. The advent of AVs presents an opportunity to improve the offer of transit services in low-density areas. In these communities, shared AVs would provide an inexpensive alternative for the ‘last mile’ of a journey. Autonomous shuttles could take residents to an intermodal station, either on demand or on a fixed schedule.

### BELLEVILLE TESTS ON-DEMAND BUS ROUTES

As part of an innovative pilot project, Belleville is offering its riders the option of choosing the route of one of its buses for one year. Riders will be able to get on and off the bus where and when they want by using an app on their phone. The data collected by the app will be used to determine an optimal route for all riders in real time. <sup>i</sup>

### INTEGRATED URBAN MOBILITY

In cities designed for cars, there are many obstacles to mobility, and they limit our ability to move around freely. However, there are actions municipalities can take to remedy this situation that would require very few changes to the built environment.

CUTA describes integrated urban mobility (IUM) as “the ability of people to move easily from place to place, based on their own needs.” <sup>j</sup>

A full trip from start to finish often requires the coordination of several modes of transportation, including walking, cycling, carpooling or public transit. The purpose of IUM is to reduce any friction between modes to the benefit of commuters. For example, adding bike racks on buses could provide for a more seamless commute. The goal is to make shared mobility and active transportation real alternatives to single-occupancy vehicles.

### LAVAL PIONEERS ONBOARD CREDIT CARD PAYMENT IN CANADA

In 2017, the Société de transport de Laval (STL) became Canada’s first transit system to offer onboard fare payment by credit card. On selected buses, commuters can make their payment by tapping their visa or Mastercard on the terminal located near the farebox. STL continues to accept other modes of payment, including cash, tickets, monthly passes and the OPUS card. Since its deployment by the STL, other transit systems in Canada have made onboard credit card payment available to their customers.

### MOBILITY AS A SERVICE TO MAKE LIFE EASIER

Owning a car has long been synonymous with freedom, but that may no longer be the case. Technology now enables us to move around as we choose, combining different modes of transportation as needed.

There are several definitions of Mobility as a Service (MaaS), but it is always the same idea. MaaS is a form of mobility management that aims to improve the user experience by reducing friction among the different modes of transportation and making it easier to get around. <sup>k</sup> It often requires a single point of payment, a real-time travel planner, and a congestion management platform. <sup>l</sup>

MaaS helps reduce dependence on personal cars. Not only is such dependence expensive for Canadian households, which spend on average \$11,900 annually on transportation,<sup>m</sup> but it is also tremendously inefficient. In 80% of cases, a car is only in use for an hour a day, and only carries one person.<sup>n</sup>

All it takes to travel now is a few clicks on a smartphone, and transit systems will have to adapt to this new reality. Commuters' behaviours and expectations have changed since mobile apps came on the scene, making understanding and deploying MaaS solutions in urban centres a pivotal part of Integrated Urban Mobility.

### TRANSIT ORIENTED RIDE-HAILING

In 2018, Montréal-based Transit app launched Transit+ which will use what it calls 'transit-oriented ride hailing.' The app will plan a trip for you that combines the flexible utility of ride hailing in areas underserved by transit as well as the affordability and efficiency of using transit—all to create a simple and cost-effective multi-modal trip for the user.<sup>o</sup>

### OFFERING ALTERNATIVES TO SINGLE-OCCUPANCY VEHICLES

The main challenge for transit systems is to convince potential users that public transit can meet their needs.

Whether it's the schedules, the duration of the trip or social perceptions, people always have a reason for not shifting from personal cars to public transit. Evolving technologies offer a unique opportunity for transit systems to adapt their services to the reality of how Canadians move. On-demand mobility makes it possible to go beyond fixed schedules and routes and solve the first mile/last mile problem, while MaaS reduces the friction between the different modes to the customer's benefit.

In 2012, CUTA revised its vision to focus on IUM. The industry recognized the need to be part of an ecosystem where public transit plays a crucial role, but can't ultimately be the only answer.

We must envision the future we want for our cities, work together to develop a 'cocktail' of mobility options, and work towards achieving it.

This is about a future where technology enables Canadians to be less dependent on cars to move freely around their communities.

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The Canadian Urban Transit Association (CUTA) is the voice of Canada's public transit industry. For additional information including research reports, industry updates, news bulletins and more, please contact us or visit our website.



PRINTED IN CANADA ON RECYCLED PAPER

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JULY 2019