

équiterre

SHARED MOBILITY

Removing Regulatory Barriers In Canadian Cities



ABOUT ÉQUITERRE

Équiterre is Quebec's largest and most influential environmental organization, with 20,000 members, 200 volunteers, and a staff of 40 people.

Mission

Équiterre offers concrete solutions to accelerate the transition towards a society in which individuals, organizations and governments make ecological choices that are both healthy and equitable.

Vision

By 2030, Équiterre, in partnership with local communities, will have contributed to the development of public policies as well as civic and business practices that lead to a low-carbon economy and an environment free of toxic substances.

Areas of Intervention

Since its creation in 1993, Équiterre developed projects on key issues such as food, agriculture, transportation, buildings, consumption and climate change.

For example, Équiterre...

- Testifies before parliamentary committees in Quebec City and Ottawa;
- Participates in public consultation processes such as the BAPE (environmental public hearings bureau), the National Energy Board and the OPCM, (Montreal's public consultation agency);
- Participates in public debates in traditional and social media;
- Publishes pleas and research to support its positions;
- Meets elected representatives of the three levels of government;
- Launches petitions and organizes public events such as press conferences, mobilizations and marches.

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EXECUTIVE SUMMARY

Our streetscapes are changing: advanced technology increasingly connects people to a variety of transportation options, and a shifting culture is increasingly interested in owning the experience of mobility rather than the vehicle itself. The result is an emergence of new, shared mobility services.

Shared mobility services have extolled the potential environmental, social, and economic benefits of reduced traffic and parking congestion, household cost savings, increased public transit ridership and activity near transit hubs, reduced vehicle kilometers travelled (VKT) and corresponding greenhouse gas (GHG) emissions reductions. Shared mobility could also support the first/last mile connection between outlying communities and public transit services.

What is preventing shared mobility options from expanding to greater scale to capitalize on these benefits ?

This report explores the regulatory barriers faced by shared mobility in Canada’s three largest cities – Montreal, Toronto and Vancouver. We examine how regulatory and policy changes can encourage greater use of shared mobility options in support of broader economic, health and climate related objectives.

Finally, as shared mobility rapidly changes – creating immediate challenges for regulators and policy makers – we make three recommendations, notably :

Action 1 : Re-evaluate existing regulations

Regulatory authorities and policy makers must re-evaluate existing regulations to determine how to integrate these new shared mobility options while maintaining the public interest and safety, encourage innovation and support broader policy initiatives.

Action 2 : Share and analyse data

By sharing data between government, transit authorities and the shared mobility industry, the connections between multiple modes can be better understood and assessed. This will improve planning and design, and measurement and evaluation of the collective environmental, economic, and social opportunities of integrated mobility networks.

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Action 3 : Coordinate efforts among all relevant actors

It is critical to take an integrated approach, engaging all relevant actors, when considering regulations or policies related to shared mobility. The federal government, could play a central role convening information into a model or “toolkit” to be adopted or adapted by regulatory authorities. The model would promote integrated policies and regulations, share best practices, identify opportunities for public-sector harmonization, public-private-partnerships, funding, and innovative technologies and analysis to help expand shared mobility.

1. CONTEXT : SHARED MOBILITY

Introduction

Shared mobility refers to an array of innovative transportation solutions that offer motorized, non-public transit alternatives to individual car ownership. Because shared mobility solutions may reduce individual car ownership and use, their adoption can lead to lower congestion and greenhouse gas emissions, among other benefits. As such, shared mobility may offer opportunity for policymakers interested in achieving environmental and related goals. While shared mobility services are growing, they could grow faster if not for regulatory barriers – often unintended – that stand in their way.

Équiterre retained Dunsky Energy Consulting to identify regulatory barriers to greater adoption of shared mobility options in Canada’s three largest cities – Toronto, Montreal, and Vancouver. This report sets them against the backdrop of the industry itself: its players, their current operations, trends, and future growth plans across the country. We then recommend options for policymakers to remove or otherwise address barriers to continued growth of shared mobility services.

BENEFITS OF SHARED MOBILITY	
The potential benefits of shared mobility touch on each of the three pillars of sustainability :	
Environmental	
Lower greenhouse gas emissions	
Improved air quality	
Increased transit ridership	
Social	
Reduced congestion	
Improved health	
Household cost savings	
Economic	
Reduced infrastructure costs and maintenance	

Structure of report

This report is structured as follows :

Section 2 – Shared mobility in canada

An overview of shared mobility options available in the three municipalities studied and the current regulatory environment.

Section 3 – The barriers limiting shared mobility

A summary of the key barriers faced by each shared mobility option individually, as well as common barriers across the industry and their corresponding impacts.

Section 4 – Next steps : accelerating shared mobility

Five key take-aways for policymakers to consider, rooted in interviews with key industry players across the shared mobility spectrum, followed by possible next steps to encourage shared mobility solutions across the nation.

Appendices are available at the end of the document.

2. SHARED MOBILITY IN CANADA

Types of shared mobility

Shared mobility services have reported many environmental, social, and other economic benefits such as reduced traffic and parking congestion, household cost savings, increased public transit ridership and activity near transit hubs, reduced vehicle kilometers travelled (VKT) and greenhouse gas (GHG) emissions. Shared mobility could also help to address the first-and-last mile between a user’s home and mobility hubs.

This study focuses on shared mobility options available in Canada’s three largest cities – Montreal, Toronto and Vancouver and the types of regulatory barriers hindering the growth and uptake of the respective options (see Table 1 below). Transportation modes studied include car sharing, and ride sharing, which includes peer-to-peer, taxi services and traditional carpooling.

Car-sharing refers to the shared use of a car or fleet of cars by multiple users. Ride sharing (also known as ‘Ride-sourcing’ or ‘ride-hailing’ to avoid confusion with carpooling), is the use of an online platform that connects travellers with drivers offering transportation services in exchange for payment. Newer forms of rideshare services permit multiple customers traveling a similar route to share a ride in a hired vehicle – an advanced form of carpooling with greater travel flexibility.

Barriers to shared mobility at local, municipal, provincial and national levels are identified and concrete actions at each level of regulatory authority are proposed.

This report focuses on shared mobility solutions including car share, ride share, taxi and advanced carpool services.

Other services, including bike sharing, peer-to-peer car sharing, public transit and micro-transit, also form an integral part of the shared mobility network, but are not the focus of our review. Descriptions of each can nonetheless be found in Appendix B.

Table 1: Summary of Shared Mobility Options and Relevant Regulatory Authorities

SHARED MOBILITY	DESCRIPTION	LEVEL OF REGULATIONS		
		MONTREAL	TORONTO	VANCOUVER
CAR SHARE	<p>Car share programs provide a network of private personal passenger vehicles to members who can access them on an as needed basis. Members benefit from vehicle use without the costs and responsibilities of ownership.</p> <p><i>One-way car sharing allows users to pick up a car and drop it off anywhere in a designated service area. Two-way car sharing requires vehicles to be picked up and returned to a designated location. Canadian providers include Car2Go, Car Share Atlantic, Communauto, Enterprise Car Share, EVO, Modo and Zipcar.</i></p>	Local and Municipal	Local and Municipal	Local and Municipal
RIDE SHARE	<p>Ride sharing or peer-to-peer sharing is where a “mobility broker” links a passenger and a driver with a private vehicle, usually through an app, to complete a ride.</p> <p><i>Ride Share providers include Uber (US and Canada) and Lyft (US only).</i></p>	Provincial	Municipal	Not regulated
TAXI SERVICES	<p>A taxicab is a type of vehicle for hire, used by a single passenger or small group of passengers, between locations of their choice. This differs from other forms of public transit where pick-up and drop-off locations are determined by the service provider, not by the passenger.</p>	Provincial	Municipal	Municipal, Provincial and Passenger Transportation Board
CARPOOLING	<p>Carpooling is the sharing of car trips where more than one person travels in a car. Commuters with a common destination that live near each other form the most common «carpool».</p> <p><i>Entities connecting carpoolers include CarpoolWorld, Kangaride, Netlift, and Ride Share in Canada, Uber Pool or Open Ride in the U.S.</i></p>	Provincial	Provincial	Provincial

(See Table 2 for more details on current regulations)

As people change the way they move around cities with the assistance of technology, and services emerge to capitalize on the shared economy, defining and understanding these new modes of transportation has not yet reached a clear consensus.

Figure 1 illustrates how all shared mobility options relate to each other and how they can be grouped into different categories, based on the type of service they offer (car share or ride share), and their business model (peer-to-peer or business-to-consumer). Industry players operating outside Canada have also been included to illustrate the diversity of options and models, and help the reader navigate this report.

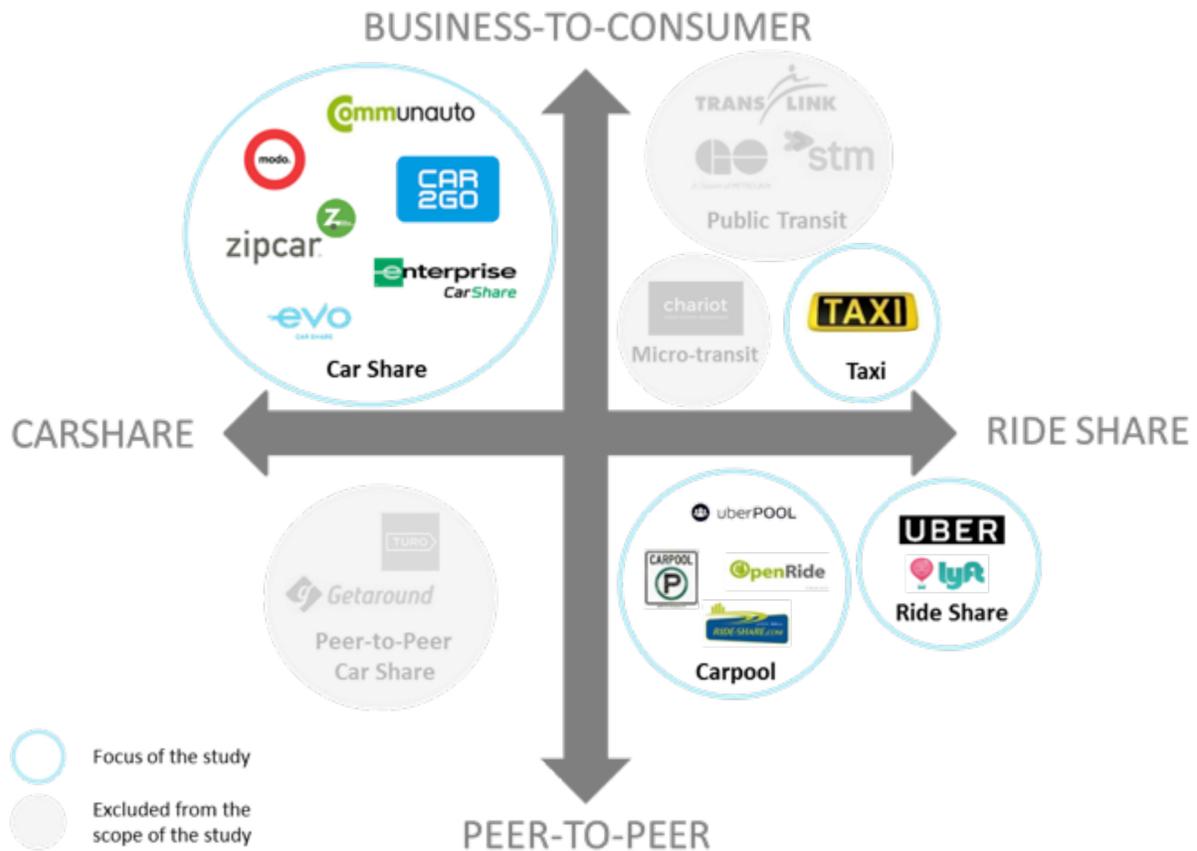


Figure 1 : Spectrum of shared mobility options

Shared mobility across Canada

Figure 2 provides an overview of shared mobility options available in the three municipalities studied in this report. The three municipalities have at least two car share service providers serving their area, and up to four in the case of Vancouver. Car2go is the only car share company present in all three municipalities. Turo has recently entered the Canadian market as the first peer-to-peer car share service, available in Toronto and Montreal. Each city also has access to several carpooling options, some of which have long been operating and are now joined by new players that rely heavily on technology to boost the market (such as Spare in

Vancouver). Taxis are present in all three municipalities, with a new player offering a 100% electric fleet in Montreal (TéoTaxi). The ride sharing company, Uber, is also present in Toronto and Montreal, while still not allowed to operate in Vancouver.

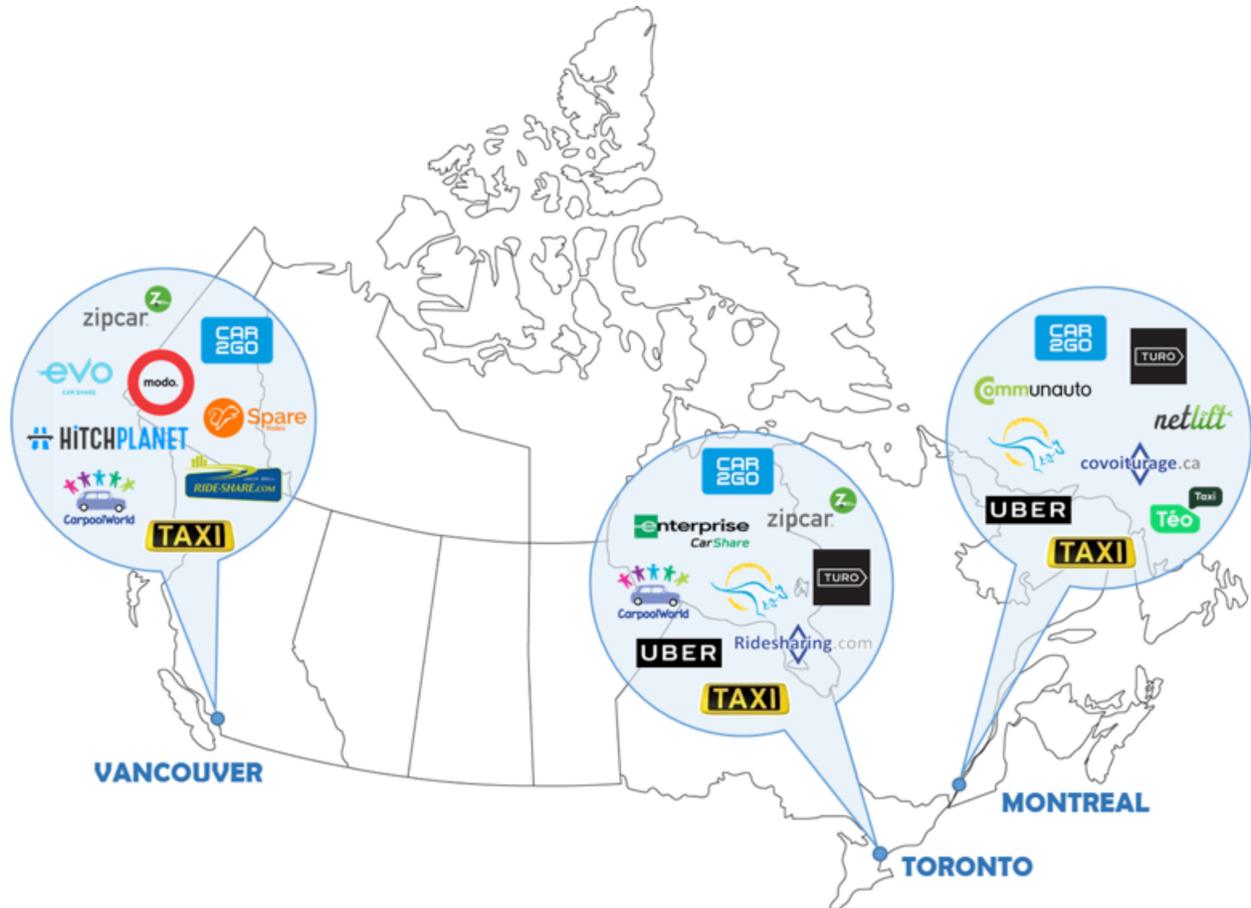


Figure 2 : Shared Mobility Services Examined in this Report

Shared mobility trends

Although statistics on shared mobility exist, they tend to be collected for each mode, in isolation from one another. The challenge with compiling data from different modes is that they are not easily comparable. Across various studies, there are differences with methodologies, concepts, and data sources. For instance, car sharing studies document the number of members of car sharing services and the number of vehicles shared among members, while transportation network companies (TNC's) generally report the number of drivers operating under their banner. It is important to distinguish between ride sharing (or "ride-sourcing") services where drivers do not share a destination with their passengers and classic "carpooling" where a group of people travel together to a shared destination.

Carpooling statistics are not easy to collect, as carpooling often occurs informally, but Statistics Canada tracks the evolution of commuters who carpool to work every five years. In addition, one might want to compare the size of these new shared mobility options to larger, more established systems such as public transit or the links between them. Again here, the metrics used to assess the usage and popularity of this mobility option tend to differ from other modes. Public transit authorities usually report ridership, while Statistics Canada provides details on the number of daily users.

As questions arise around complementarity and competition between different mobility options, and their contributions to economic, social and environmental objectives, there is a greater need for better data on each of these modes, and most importantly, how they are interconnected. We address this opportunity under Section 4 : Next Steps. Below are statistics for each shared mobility option.

Car share

Although rapidly changing, the car share industry has been established in Canada for a longer period than ride sharing services. Therefore, the former has been studied more extensively and its growth in recent years better documented.

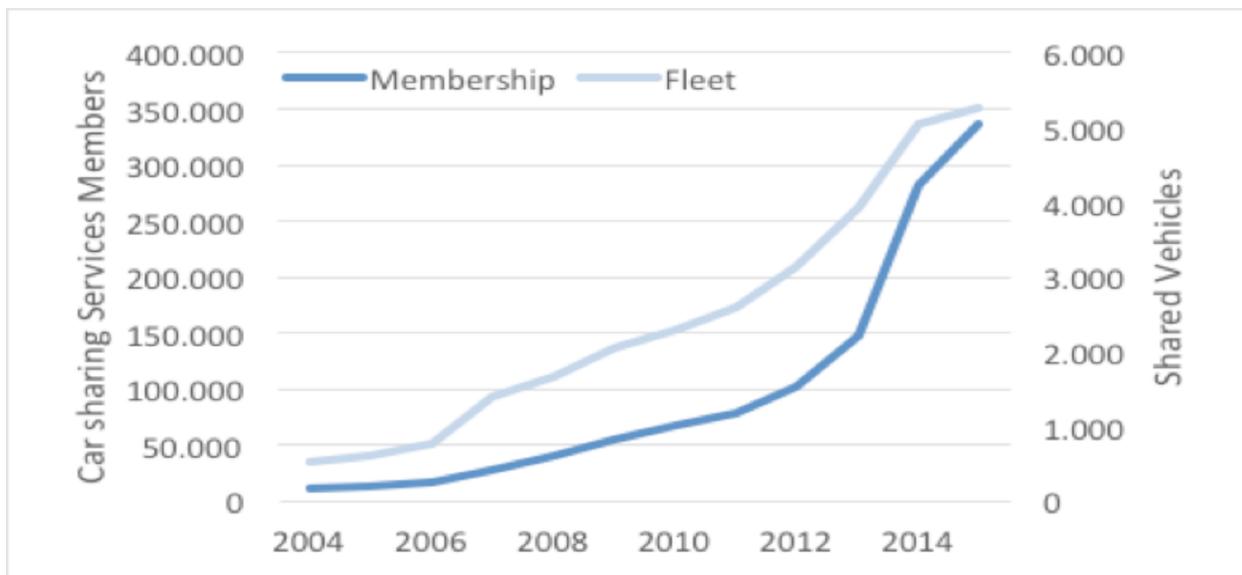


Figure 3 provides an illustration of the growth of the car sharing industry in Canada over the last 12 years¹. Both fleet size and membership have increased significantly in the last two to three years. Indeed, car sharing membership grew by 230% between 2012 and 2015².

1. Shaheen and Cohen, 2015. Innovative Mobility Carsharing Outlook. Carsharing Market Overview, Analysis and Trends (Summer 2015). University of California, Berkeley.

2. <http://www.forbes.com/sites/briansolomon/2015/05/01/the-numbers-behind-ubers-exploding-driver-force/#f43a8e849014>

Rideshare

The ride sharing company Uber started its Canadian operations in Toronto in 2012 and currently claims to have over 15,000 drivers in Toronto, compared to approximately 3,000 in Montreal. Uber briefly launched its services in Vancouver in 2012 but left the market until British Columbia can develop regulations for ride sharing services. In August 2016, the number of unique Uber drivers who completed four or more trips in Canada amounted to 32,000. Uber Canada also reported 1,270,000 unique riders who used the service between June 1st and August 31st, 2016. No historical data was available regarding Uber activity in Canada. However, a glimpse south of the border might provide a good indication of the potential for growth: in the U.S., the number of new drivers has more than doubled every six months between 2012 and 2015.

Taxis

Comparatively, there are approximately 4,500 taxi licences available in Montreal, 10,000 in Toronto, and 600 in the City of Vancouver (1,500 in the metropolitan area). Vancouver is often cited as the municipality with the lowest ratio of taxi per inhabitant.

Carpool

Per the 2011 Canadian census, 74.0% of commuters, or 11.4 million workers drove a vehicle to work. Another 5.6%, or 867,100 people made the trip as passengers. Of the people who commuted to work by vehicle, 17% stated that they carpooled (14.2% in Montréal, 17.7% in Toronto, and 16.6% in Vancouver)³ while the rest drove alone⁴, an increase from 15% in 2006 and 13% in 2001⁵.

The Canadian census also tracks commuters who use public transit and those who rely on taxis (taxi commuting not shown on the graph due to the small share it represents, approximately 0.1%) (Figure 4).

The trends toward greater mobility are present across the country. According to data compiled by the Canadian Urban Transit Association public transit usage has shown only modest growth in recent years,⁶ while the number of people using other modes of transport has grown rapidly. The rapid increase in the number of people travelling as passengers in a vehicle or using carpool travel options indicates a strong demand for shared mobility options.

3. <http://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/2011003/c-g/c-g02-eng.cfm>

4. https://www12.statcan.gc.ca/nhs-enm/2011/as-sa/99-012-x/99-012-x2011003_1-eng.cfm

5. http://publications.gc.ca/collections/collection_2012/tc/T41-1-73-eng.pdf

6. <http://cutaactu.ca/ridership2015/english.html>

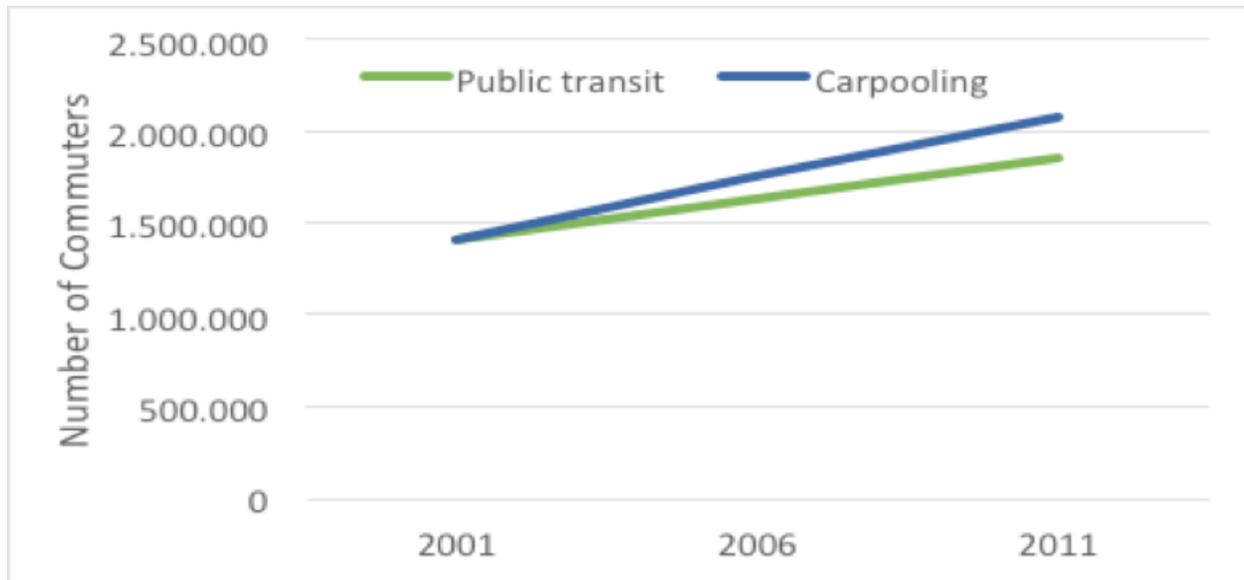


Figure 4

The current regulatory environment

While we observe similar growth among the shared mobility options studied, there is also significant diversity in the regulatory approaches among the cities studied. Each region studied contains significant jurisdictional diversity, often with multiple public transit agencies. Each municipality possesses its own regulatory environment and unique mobility context. Provincial governments can provide resources and guide legislation but have only recently begun to take action on shared mobility. The federal government is responsible for GST/HST remittances and their application to drivers working in the shared mobility economy.

Regulations are prescribed by authorities and are intended to ensure safe conditions for those working in the industry, maintain public health and safety, and consumer protection, and to enhance the social and economic well-being of the community. Questions remain on how prescriptive regulations must be; whether existing regulations still apply as new business models emerge; and how regulations can be designed to address safety, congestion and climate related issues important to government, while ensuring existing and new shared mobility options thrive in this new paradigm.

Car sharing is not subject to the same regulatory oversight as others :

Unlike the heavily regulated taxi industry or the growing debate over regulations pertaining to ride sharing services, car sharing has not been subject to the same regulatory controversy. Regulations, limited to parking across all three Municipalities studied, detail on and off-street

parking such as permitting, and when and where vehicles can park and for how long. While no one has currently raised the issue, questions remain on whether car sharing simply falls under the car rental industry definition, which in some cases, includes regulatory oversight. “Car sharing companies are considered commercial, but members view this as localized personal use – it’s a grey area. Regulations are not built for grey.” There was consensus among all car share industry stakeholders that there are opportunities for future policy to expand car sharing and help to address other government related goals.

Car share is thought of as commercial, but members view this as localized personal use – it’s a grey area. Regulations are not built for grey.”

Tracey Cook, Executive Director

Municipal permits and regulations, City of Toronto

While ride sharing has disrupted the tightly regulated taxi industry, it has invigorated discussion on whether existing regulations still apply :

Across the three Municipalities studied, there was little in common among the jurisdictions that have regulatory oversight, nor consensus on how to regulate ride sharing. The province of Quebec regulates the taxi industry, while the Municipalities are the authority in Ontario. British Columbia’s taxi industry is a triad of regulatory authorities including the Province, Municipalities and the Passenger Transportation Board. Of the three Municipalities, only Toronto has regulations that apply to ride sharing companies. The Licensing of Vehicles-For-Hire bylaw, implemented in July 2016, now includes a licence for private transportation companies. Revisions also reframed the requirements for the taxi industry providing for more flexibility and a level playing field for these two services to co-exist.

Traditional carpooling is addressed similarly across all three regions, although fares are more tightly regulated in Quebec :

Carpooling has limited regulatory oversight, however, it is mentioned similarly in all three provincial transportation acts. All three acts stipulate that carpool drivers do not need to purchase commercial insurance or a licence if they don't charge passengers more than the cost of the trip. Drivers are also not allowed to offer more than one return trip per day. However, as part of the recent overhaul of taxi regulations in Quebec (law 100), the government included a carpool provision, specifying that the cost charged to passengers cannot exceed the allowance granted to a government’s employee for use of its personal vehicle (\$0.43/km). While this provision is assumed to minimize any potential for carpoolers to charge more than the cost of the trip, it can negatively impact those that carpool using car share services. For those that car pool using a car share service, particularly on short distances, the cost of the trip would likely exceed the maximum amount that can now be charged under the Act.

Table 2 summarizes these regulations at the municipal and provincial government levels in each municipality.

SHARED MOBILITY	CURRENT REGULATIONS		
	MONTREAL	TORONTO	VANCOUVER
CAR SHARING	Municipal and borough parking regulations include : permitting, on-street/off-street parking, including EVs	Municipal parking regulations include : permitting and on-street/off-street parking	Municipal parking regulations include : permitting and on-street/off-street parking
Reference documents	By-law parking of self-service vehicles (City of Montreal)	Toronto Municipal Code, Section 400-33	Parking bylaw 6059, Street and traffic bylaw 2849 (City of Vancouver)
RIDE SHARING	Provincial regulations treat ride sharing (such as Uber) as a taxi service. Province regulates fares, number of licences, licence price (adjusted based on operating hours), code of conduct and ethics, etc.	Municipal regulation stipulates min fares, vehicle safety standards certification, age of vehicles, insurance, etc.	No regulations – currently in consultation process Ride sharing regulations expected by the end of 2017
Reference documents	Law 100 (Quebec)	Toronto Municipal Code, Chapter 546 – Licensing of Vehicle-for-Hire	-
TAXI SERVICES	Province regulates fares, number of licences, code of conduct and ethics, etc.	Municipal regulation stipulates fares, vehicle safety standards, low emissions standards, age of vehicle, emissions standards for new vehicles, training for accessible vehicles, etc.	Municipal regulation requires licence and provincial regulations regulate fares
Reference documents	Law 100 (Quebec)	Toronto Municipal Code, Chapter 546 – Licensing of Vehicle-for-Hire	Vehicles for Hire Bylaw 6066 (City of Vancouver), B.C. Passenger Transportation Act
CARPOOLING	Across all three jurisdictions, Provincial Transportation Acts stipulate carpool drivers do not need to purchase commercial insurance or a licence if they don't charge passengers more than the cost of the trip. Drivers are also not allowed to offer more than one return trip per day. Quebec sets a maximum amount to be charged to passengers (\$0.43/km).		
Reference documents	Law 100 (Quebec)	Ontario Public Vehicle Act	B.C. Passenger Transportation Act

Table 2 : Regulations Applicable to Shared Mobility Options

3. BARRIERS LIMITING SHARED MOBILITY SERVICES

Shared mobility industry players and municipal staff from Montreal, Toronto and Vancouver provided their perceptions, attitudes, and opinions on how regulatory barriers currently limit the expansion of shared mobility, but also offered insight into how regulations can enhance and incorporate shared mobility into a fully integrated mobility network. While the nature of the study was exploratory, it provides a deep and more complex understanding of the regulatory barriers applicable to shared mobility and their impacts.

Table 3 lists the companies that were interviewed and identifies their service area.

COMPANY	SERVICE AREA		
	Montreal	Toronto	Vancouver
	●	●	●
	●		
		●	●
	●	●	
	●		

Table 3 : List of industry players interviewed

Toronto's parking limitations

Toronto does not explicitly prevent on street parking in their regulations, however parking is limited to three hours in residential areas overnight. Car2go has accepted to pay fines to keep their service accessible to their members.

Barriers to the car share industry

The barriers related to car share industry players were consistent across all three service providers interviewed. The **top four barriers** include :

1. Parking

High demand for parking and land use in dense urban centres is a common issue that Municipalities struggle to address. Plus, Municipalities must balance the need for adequate parking spaces for those living in residential areas. Car share parking regulations typically allow a mix of on and off street parking, however most of those interviewed reported that the majority is relegated to off-street parking in private commercial lots, for example malls. On-street parking permits can be expensive and in certain areas of Montreal, not permitted. While there is no regulation preventing on-street parking, Toronto limits parking in residential areas to three hours, making overnight parking impossible. Car2go has accepted to pay fines to keep their service accessible to their members.

2. Visibility

Industry players reported that signage to identify and promote designated areas is often subtle, causing confusion with drivers. Those interviewed felt signage needs to be more deliberate and dedicated parking needs to be in areas of high visibility and accessibility complementing public transit. Zipcar reported working with Municipalities to produce signage per the City's specifications, but there is little to no collaboration on how signage can be improved. Visibility is also intrinsically connected with parking regulations. Indeed, using off-street instead of on-street parking makes car sharing less visible to potential users.

3. New construction parking requirements

Vancouver and one Borough in Montreal have progressive provisions regarding new construction parking substitutions allowing for parking spaces to be reduced by five or six, respectively, for every one car share parking space. Vancouver also reported that there are provisions allowing for the best parking spaces to be reserved for car sharing further increasing visibility and user-friendliness. Incorporating car share parking early in the design of new developments is critical, both to ensure residents have access to sufficient mobility options and to ensure access to shared vehicles to non-residents of the building. All

stakeholders should be involved at this stage, including developers, future residents, as well as the City’s zoning, permitting and land use planning departments. While recognizing there are exceptions in some areas, the car share industry players operating in Montreal viewed the current zoning regulations as outdated and a barrier. They would like to see parking substitutions in new construction as standard practice. Toronto’s planning department indicated there was nothing in the current regulations to address this, however there has been several new developments approved, on a case by case basis, that have little to no parking. As these practices increase, a focus should be made to ensure alternative mobility options are available to residents of these new buildings.

4. Conflicting goals

Those interviewed identified conflicting policy goals as one of the top barriers. It was echoed by all that the low cost of car ownership, inexpensive parking and incentives to buy more efficient cars, such as electric vehicles, encourages single occupancy vehicle use. For instance, an electrification strategy may drive an increase in the purchase of electric vehicles (to meet climate goals), but could at the same time favor single occupancy usage, which would fail to address other policy goals such as reducing congestion, parking land use and car-related infrastructure costs. Government fees and taxes, including regulatory compliance fees and federal/provincial taxes on taxi, ride sharing and car sharing generally exceed the marginal cost of using a personal car, thus discouraging drivers from switching to these alternative options. In addition, road/parking taxes and tolls intended to reduce congestion can negatively impact an industry that is trying to achieve the same thing. As another example, Montreal’s Transportation Electrification Strategy, will begin limiting the number of permits available for non-electric vehicles to encourage one-way car sharing companies to switch their fleets. While the car share industry has already begun to incorporate electric vehicles into their fleet, the quick ramp up is viewed as being costly and could slow down service expansion projects. Current infrastructure for electric vehicles (charging stations) priority is also not conducive to the car share model – most charging stations are installed in the downtown core, but would best serve car share companies if located in residential areas where cars are parked overnight.

Barriers to the ride share industry

Uber is currently the only ride share service provider operating in two of the municipalities studied, but they have been actively involved with identifying how existing regulations are hindering growth. Two barriers were identified :

1. Insurance

As ride sharing expands to critical mass, questions abound on what is the appropriate insurance necessary for the safety of drivers and their passengers and when should coverage apply. The ride sharing business model has created a challenge for insurers to determine what the appropriate coverage is and at what period is a driver's vehicle in personal and commercial use. A driver of a ride share company may have the app on, but not picking anyone up – at what point should the ride sharing company be covering them? Ontario's insurance regulator is the second in the country, after Alberta, to approve coverage for drivers of ride sharing services. While regulations are in consultation in the other provinces, this issue will need to be part of the discussion.

2. Existing regulations are not designed for new business models

Ride sharing companies and taxis are both ride-hailing services, but should the same regulations apply? Uber views their business model very differently from that of taxis reporting that many of their drivers consider this supplementary, rather than full-time, employment with 50-55% of drivers on the road for 10 hours or less per week. The stringent requirements to obtain a taxi licence, such as in-person permit applications, background checks and classroom training is not conducive with a driver that is only on the road five hours per week. Price caps and supply caps also create an undesirable environment. Interestingly, Toronto originally took legal action against Uber to require them to obtain a taxi licence under the existing regulatory regime, but the court ruled that the definition of a taxi service did not apply to the Uber model. Thus, Toronto took the opportunity to reframe their bylaw and add a new class licence for private transportation companies (PTCs); it recognized the different business model, allowing these companies to hold the relationship with their drivers and be accountable for complying with regulations. It should be noted that a similar bylaw has been implemented in Ottawa. Ottawa and Toronto collectively represent 70% of the vehicle-for-hire market in Ontario. The province of Quebec recently passed legislation treating ride share companies, such as Uber, the same as taxis however they implemented a 90-day pilot period to review and consider possible adjustments to the regulations.

Barriers to the taxi industry

The taxi industry has a long history, engrained in existing doctrine that is consistent across municipalities. How can regulations create more flexibility allowing for the industry to operate competitively in this new environment ? Téo Taxi provided some insight described below.

1. Caps

The City of Toronto Act (COTA) gives Toronto the authority to limit how many Taxis are licensed to operate, as well as the option to waive those limits. Toronto originally placed a cap on the number of licensed taxis with the objective of balancing availability and affordability, reducing traffic congestion and to avoid too many taxis negatively affecting driver incomes potentially leading to dangerous habits with increased competition. At the same time a new licence was developed for private transportation companies, the City re-evaluated the taxi licence removing caps on licences and ending training requirements allowing for a more flexible market in which to operate.

2. Licence transfers

In general, taxi drivers own one taxi licence that is associated with one vehicle, and the process for transferring the licence to another vehicle is burdensome. While this process may be appropriate for individual taxi ownership, it is less so for large fleets. In larger fleets, the number of licences would not necessarily match the number of vehicles, and licences would ideally be easily transferable to optimize the use of licences when a vehicle is out of order. This current administrative barrier is even more critical for an electric fleet, where vehicles must charge frequently and are out-of-service during those periods. Téo Taxi is currently operating under a two-year pilot project and as such, was exempted from this regulatory measure and allowed to possess more vehicles than licences. The high cost for vehicle registration, along with expensive insurance premiums, may also restrain the flexibility of taxi services. In comparison, the ride sharing service, Uber, is piloting a fee per kilometer in QC to cover insurance requirements. Relevance of insurance premiums should be evaluated considering that taxis can contribute to reduced car ownership and thus, insurance claims.

Taxi regulations and GHG emissions

Strict taxi regulations that stipulate defined service areas, including pick-up and drop-off rules, are likely to increase greenhouse gas emissions and congestion, due to the additional driving required to return to the taxi's initial service area or dedicated waiting lines.

3. Route constraints

Taxi service areas are currently heavily regulated. For instance, in Montreal, each taxi operates in a specific service area and must either start a ride from, or end it in its service area. This leads to additional distances being travelled for taxis that finish a ride in a different service area and must return unoccupied to their own service area to pick up a new customer. In addition, taxis that finish a ride can either continue driving until a customer hails them, or go to designated waiting areas, but cannot park on-street. In both cases, it leads to more driving and

increased greenhouse gas emissions and congestion. Again, these hurdles are exacerbated in the case of taxi companies with electric vehicle fleets, for which each kilometer travelled is important, due to the limited driving range that the battery allows. Electric taxis want to maximize the use of their vehicle for transporting customers (thus recouping their investment for a more efficient vehicle), not for driving around the city unoccupied. Again, these rules were softened for Téo Taxi under the two-year electric taxi pilot project.

4. Training requirements

Montreal and Vancouver taxi regulations require that taxi drivers pass a course to be eligible for a taxi licence. Vancouver training requirements consist of a five-day Taxi HostPro course, while Quebec requires that taxi drivers take a five-week (150 h) class, limiting de facto the potential for occasional drivers to enter the business. As part of the revision of the Vehicle for hire bylaw, Toronto no longer requires Taxi drivers to take City-run training as a condition of licensing, acknowledging the role of the taxi industry in establishing training guidelines and standards.

Barriers to carpooling

Carpooling has limited regulatory oversight; however, carpooling is expressly stated in provincial statutes. Carpooling represents a small contribution to the shared mobility sphere and no regulatory hurdles were raised by Toronto and Vancouver. In Quebec, a major limitation to carpooling expansion emerged following the adoption of bill no. 100 in June 2016. Beyond limiting the amount that can be shared among passengers for the total cost of the trip (as the two other jurisdictions do), the government of Quebec also imposed a maximum amount per kilometer (\$0.43/km, equal to the government's transport allowance for personal vehicle use). This approach severely impedes carpooling in the context of car sharing, where costs for using car sharing services largely exceed this set amount in most situations. This is especially true for urban carpooling, where distances travelled are small in comparison with the costs to access a shared vehicle (for example, using a Communauto one-way car sharing vehicle currently costs \$0.38/min or \$12/hour for their Auto-mobile free basic subscription plan. The cost could be greater than the maximum \$0.43/km if being used short distance).

Common barriers across the shared mobility industry

While there are unique barriers to each shared mobility mode, there were common threads that emerged across the industry spectrum and between public and private entities.

1. Lack of understanding and recognition

Some interviewees mentioned that the ambiguity of business models (for example the difference between taxi and ride share) has created confusion when drafting regulations. Some interviewees reported seeing an increased interest from policy makers and have been proactive to help clearly delineate the different service offerings. Government understanding has evolved over time allowing them more and more to develop policy to support shared mobility and linking these services to other policy initiatives. Still, other stakeholders felt that, in Canada, car sharing may not be recognized as a primary solution to greenhouse gas emissions reductions. Research has shown that the more people use shared modes of transportation, the more likely they are to use public transit, own fewer cars, and spend less on transportation overall. The industry wants government to acknowledge shared mobility's contribution to decreasing the total number of cars in cities and the benefits that follow, such as reduced congestion and greenhouse gas emissions.

2. Lack of communication

All industry players reiterated the importance of being provided a clear understanding of broader government policy goals. Everyone interviewed agreed that when drafting regulations or designing policies, whether directly or indirectly related to shared mobility, it was critical that the industry be included in the conversation. It would benefit both sides to understand how car sharing can complement or is impacted by policy changes.

3. Lack of harmonization

Different regulations and different rules within each municipality can be challenging. In Toronto, taxis or private transportation company drivers originating a pick up within the city must have a Toronto licence. When a passenger's destination is in a neighbouring City, drivers may experience inefficiencies and lost fares upon their return if they do not hold a licence in multiple Cities. Province-wide regulation or reciprocal licencing for intercity mobility may be a possibility, but would likely require further exploration.

Table 4 provides a summary of barriers that are unique to each shared mobility option and those that apply across the sector.

BARRIERS	CAR SHARING (one-way)	CAR SHARING (two-way)	RIDE SHARING	TAXI	CARPOOL
Lack of Parking	●	●			
Reduced Visibility	●	●			
Outdated Zoning		●			
Conflicting Goals	●	●			
Insurance			●		
Outdated Regulations			●		
Supply Caps	◐		◐	●	
Licence Transfers				●	
Route Constraints				●	
Lack of Understanding and Recognition	●	●	●	●	●
Lack of Communication	●	●	●	●	●
Lack of Harmonization	●	●	●	●	●

Table 4 : Summary of Barriers Applicable to Shared Mobility Options
 (Full circle represents applicable to all and half empty circle applies to only a portion of the industry)

4. NEXT STEPS : ACCELERATING SHARED MOBILITY

Industry players and all levels of government have an opportunity to shape policy and regulations that will achieve multiple objectives, reasonably address the needs of those involved, and address the growing number of users that are “more comfortable owning the trip rather than the car”. Through the interviews conducted for this study, common elements were repeated by participants and form the following five take-aways :

Key take-aways

Existing regulations may no longer apply

Trying to fit new business models within existing regulations may not be appropriate. Outdated zoning laws, regulations designed for long-established services and a generational, lifestyle shift placing less emphasis on car ownership and more on mobility, may require policy makers to re-evaluate current regulations. Pilot programs may allow Municipalities time to adjust and determine how best to draft regulations. In addition, current regulations consider each shared mobility option in silos, while emerging models point towards greater integration of multiple service offerings. Future regulations should be flexible enough to allow business models to combine services, for example, offering taxi, car sharing and delivery services using the same vehicle. It will be important to strike a balance between meeting the needs of government and users, while offering flexibility to adequately reflect these new business models.

Piloting alternative approaches

The Montreal borough of Le Plateau was the pioneer in allowing on-street parking with a “universal” parking permit delivered to car share companies. After a successful implementation, this was extended to other boroughs.

Vancouver cautioned on how prescriptive regulations should be. The City started with a very prescriptive approach to new construction defining the number of parking spaces dedicated to car sharing, where they would be located, etc., but soon realized that industry expertise could define these things.

Engaging with industry will enable more efficient policymaking

While the business models and regulations of each shared mobility option differ, it is imperative that they be included as part of any discussion on new policies and regulations (that either directly or indirectly affect shared mobility options). Shared mobility industry players can provide support by way of clearly defining the different business models so policy makers can craft relevant and favourable policy frameworks. They can also flag regulatory barriers that jeopardize their activities (such as the establishment of a maximum amount that drivers can

charge for carpooling in Quebec, which seriously hampers the potential for urban carpooling in the province) and offer potential solutions for addressing them. A well informed, holistic approach will create a robust network of mobility options and a broad, effective multimodal transportation system.

Harmonization of mobility services can create valuable synergies

Transportation crosses multiple departments within each level of government and across multiple regions and jurisdictions. Harmonization of efforts among departments, all levels of government and across jurisdictions can identify synergies and common mobility goals, allow for information sharing and coordination to create a network where shared mobility is part of an integrated planning process. Montreal reflects this new approach as they move to revise their existing Transportation Plan to a new “Mobility Plan” that will provide guidelines applicable across boroughs.

Partnerships can benefit everyone

All those interviewed agreed that there was a benefit to increased collaboration and partnerships. Co-locating car share, biking and transit in what is often referred to as “mobility hubs” offer tremendous opportunities for fully integrated services and connecting users beyond the last mile. Car and ride sharing does not compete, but rather complements these alternate modes of transportation. Several partnerships with transportation authorities, commuter rail systems and universities were mentioned. Already, partnerships between transit and private mobility providers, such as ride sharing and micro-transit companies, have emerged, providing services in lower-density areas to connect suburban users to mobility hubs. Public-Private partnerships will clearly identify the challenges and the opportunities to address traffic and parking congestion and climate related issues, enhance urban mobility through better integration of complementary services and provide valuable information on trip data and cross-mode links.

The STM example

Montreal’s Transit Agency (STM) developed partnerships with car sharing and bike sharing companies to offer rebates on combined services.

Incentives could support the expansion of car sharing

Both financial and non-financial incentives can be used to support car sharing options and their societal benefits :

Financial Incentives

Financial incentives are an effective tool to encourage people to buy single-occupancy vehicles. Those interviewed offered the following suggestions on possible financial incentives to consider :

Federal/Provincial Government

- Government incentives towards membership and applications fees could be provided to support car share members.
- Bridge tolls could be lowered.
- Provincial or Federal tax credits could be offered for users (like public transport), shared mobility providers and businesses that join car sharing.
- Incentives for EVs – QC and ON offer incentives for individual and for shared EVs (taxi or car share). Incentives could be larger for shared fleets used by multiple members.

Municipal Government

- Cities could decrease parking permit prices and/or offer lower parking permit prices for EVs.
- Revenue guarantees offer an opportunity to encourage new shared mobility markets through shared risk. As an example, Municipalities could support new shared mobility operators in their community by contributing the difference between member fees and the estimated cost per month of providing the vehicle, ramping down revenue guarantees as membership grows and the industry can support itself. Alternatively, building owners could provide a revenue guarantee to car sharing companies in exchange for having vehicles on site and/or offering tenants' exclusive use during certain hours. This could be particularly effective in areas that aren't conducive to car sharing to encourage uptake.

Non-Financial Incentives

Non-financial incentives can increase visibility and offer users additional benefits, including :

- Zero Emission Vehicle (ZEV) mandates, adopted in QC and currently being considered in other provinces, could allow car manufacturers who sell EVs to car share companies to claim additional vehicle credits to help achieve compliance with the added benefit of decreasing the total number of vehicles sold.
- High Occupancy Vehicle (HOV) lane accessibility
- Dedicated parking near public transit and active transportation hubs (walking and bike paths) that are predictors of success for car share businesses

- Development of insurance products, in partnership with the insurance industry and regulators, that recognize the reality of shared mobility business models and potential benefits (including taxi, ride sharing drivers, carpoolers, car sharing users, etc.)
- Complementary policies to reduce single occupancy use and support shared mobility such as increased parking rates and congestion pricing. Note, congestion pricing could benefit carpooling but could negatively impact car sharing unless they were exempt from paying tolls.
- Free access to national parks
- Fleet partnerships between government and/or private company fleets and car share companies, whereby car sharing partially or fully replaces fleet vehicle

Next steps

The key take-aways point to actions that policy makers can use to seize the opportunities proffered by shared mobility innovations. New forms of governance and policy making are needed while it is imperative that governments clearly identify and update their strategic policy objectives. Harmonization in the public sector, and open communication and cooperation between public and private industry, can align common goals, address multiple needs and allow existing and new business models to grow.

Relevant and forward thinking regulations that integrate existing and emerging transportation modes will take time to craft. Three initial steps could provide a platform to build on as regulating authorities and policy makers move forward:

Action 1: Review existing regulations

As the shared mobility environment grows and changes quickly, regulatory authorities and policy makers must re-evaluate existing regulations to determine how to integrate these new shared mobility options while maintaining the **public interest and safety**, encourage **innovation** and support broader policy initiatives. At the same time these reviews are being conducted, **consult with industry stakeholders and other jurisdictions** to i) better understand these new innovations and where the challenges and opportunities lie, ii) identify commonalities and shared goals, and iii) build on the expertise and experience of others.

Municipal governments : Assure that the growth of shared mobility serves the public good and general transportation objectives

Provincial governments : Develop a provincial vehicle-for-hire regulatory framework which defines minimum standards while permitting variation at municipal levels

Action 2 : Analyse shared mobility impacts using an integrated approach

While recent studies have touted the benefits of shared mobility, governments may still not understand how to measure and evaluate the environmental, economic, and social benefits of shared mobility. By **sharing data** between government, transit authorities and shared mobility industry players, the connections between multiple modes can be better understood and assessed. This will improve **planning and design, and measurement and evaluation** of the collective environmental, economic, and social opportunities of integrated mobility networks.

Municipal governments : Assure collaboration between public agencies and shared mobility providers

Provincial/federal governments : Establish open standards for transportation data and require data sharing

Federal government : Support research activity on the impact of shared mobility

Action 3 : Coordinate efforts with all relevant actors

Mobility issues cross departments at all levels of government, jurisdictional boundaries, transit authorities, not-for-profits and industry. Consultation and communication among all those involved will facilitate a big picture approach that considers mobility from all perspectives.

The Federal Government could play a role in convening information into a model framework or “toolkit” to be adopted or adapted by regulatory authorities. The framework envisioned would promote integrated policies and regulations, identify best practices, funding available and facilitate **shared learning**. This will lead to **harmonization and coordination** of resources, boost information and knowledge transfer, and maximize the use of innovative technologies to increase access to shared mobility benefiting everyone.

What’s around the corner ?

While questions remain on how best to approach regulations pertaining to shared mobility, the one thing that is certain is that our transportation system is on the cusp of a major disruption.

What will our future mobility network look like ? Those interviewed provided a glimpse into their view of the future of shared mobility. Over the next decade, study participants envision that new business models, such as micro-transit, will continue to arise; that car share, ride share and taxis will converge; that support for active transportation solutions like bike sharing will continue to grow; that motorized transportation will shift to electrification and automation; and that more people will own less vehicles, requiring less parking in denser areas.

Each of these changes can significantly impact urban planning and the way we move around our cities. Automation will likely disrupt the mobility landscape and is expected to pose new regulatory challenges. Policy-makers should start thinking about how shared mobility can complement autonomous vehicles to avoid potential rebound effects from the use of this technology. While autonomy will allow drivers to place their attention elsewhere, the demand for mobility could increase thus adding to congestion and increasing passenger miles traveled. Regulatory authorities everywhere would be well-advised to take a proactive approach to these forecasted changes at this early stage of transformation.

APPENDIX A :

INTERVIEW GUIDES

Industry stakeholder interview guide

The following organizations have been interviewed : Car2Go, Communauto, ZipCar, Uber and Téo Taxi.

Topic A : Car share Industry Stakeholder Historic Trends/Operations

1. When did your company begin operating ?
2. How many members do you currently have ?
3. How many vehicles are currently shared among your members ?
4. What is your current business model ?
5. What is your current service model (one-way and/or two-way) ?
6. How has the industry changed since operations first began (for example: competition with other industry stakeholders, growth trends in membership) ?

Topic B : Regulatory Barriers

1. What are the provincial acts/regulations and/or municipal bylaws that govern the car share industry in your service area ?
 - a. How do these positively and/or negatively impact your operations ?
2. Is there sufficient dedicated parking (e.g., marked parking zones for car-sharing, on-street/off-street parking, free metered parking on-street, and discounts in municipal lots) ?
3. Are there municipal fees that are being transferred to members that could be reduced to help reduce cost barriers – if any ?
4. Ease of access/proximity to users is often cited as a barrier to potential use and benefits of car share in lower density (suburban) areas. How can municipal design foster development in suburban areas, where walkability and the abundance of transit remain short of the levels needed ?
5. Do the municipalities in which you operate provide incentives or grant reductions in residential parking spaces for developers to incorporate car sharing into new construction projects (through site planning or zoning) ?
6. Are there other barriers in which the regulatory environment is preventing the development of the car sharing industry (e.g. snow removal, limits to fleet size) ?

7. How can regulations/bylaws/policy encourage more households to shed their vehicles and still maintain a level of mobility that is acceptable to them? For example: combination of proximity to jobs, complementary external factors (e.g. transit quality, gas prices, tolls, road pricing), and changing household perceptions.

Topic C : Future Growth Plans

1. Can you share your future growth plans in existing markets and new markets ?
2. Have you conducted any studies on car sharing industry trends that you can share ?
3. What are the top 3 regulatory barriers that you foresee to your future growth plans ?
 - a. What would help mitigate those barriers ?
4. Have you established partnerships with the municipality/developers/transit authorities/businesses/universities/other ?
How can partners play a role in expanding the supply and availability of sustainable alternatives such as car sharing (e.g., providing incentives and rewards for undertaking sustainable travel habits, marketing, transit integration/discounts, parking) ?

Municipality interview guide

The following municipalities have been interviewed: Montreal, Toronto and Vancouver.

Topic A : Car share Regulatory Barriers

8. What car share companies currently operate in your municipality ?
9. What are the provincial acts/regulations and/or municipal bylaws that govern the car share industry in your municipality ?
10. Is there sufficient dedicated parking (e.g., marked parking zones for car-sharing, on-street/off-street parking, free metered parking on-street, and discounts in municipal lots) ?
11. Are there municipal fees that are being transferred to members that could be reduced to help reduce cost barriers – if any ?
12. Does your municipality provide incentives or grant reductions in residential parking spaces for developers to incorporate car sharing into new construction projects (through site planning or zoning) ?
13. Are there other barriers in which the regulatory environment is preventing the development of the car sharing industry (e.g. snow removal, limits to fleet size) ?
14. How can regulations/bylaws/policy encourage more households to shed their vehicles and still maintain an acceptable level of mobility ? E.g., municipal design, combination of proximity to jobs, complementary external factors (e.g. transit quality, gas prices, tolls, road pricing), and changing household perceptions.

Topic B : Rideshare Barriers

1. Metro Vancouver is the largest North American Metropolitan area without ridesharing (Uber is not regulated to operate in British Columbia). Can you explain why ?
 - a. Do you know when regulation on ride sharing are expected ?
 - b. What should regulations/bylaw include? (insurance requirements, required driver training, caps on the number of vehicles, age of cars similar to the taxi industry, other)
2. The City of Toronto recently launched regulations around Private Transportation Companies. Can you explain what led to this ?
 - a. What do the regulations cover ?
 - b. Can you describe the process to develop regulations ?
 - c. Was there opposition from the PTCs to this and how was opposition overcome ?
 - d. Are there differences in regulations between PTCs and taxis ?

Topic C : Taxis

1. We understand the existing taxi regulatory regime in B.C. includes licencing under the Passenger Transportation Act and additional regulations through the Vancouver Charter and Vehicles for Hire Bylaw. Are there other regulations that govern taxi operations ?
2. We understand the existing taxi regulatory regime is based on the City of Toronto Act, 2007, which grants the City of Toronto the authority to enact by-laws for the licensing, regulating and governing of businesses wholly or partly carried on in Toronto. Are there other regulations that govern taxi operations ?
3. Are there limits to the number of taxis operating in the City ?
 - a. If so, what is the purpose of these caps ?
 - b. Does fewer service providers from which to choose lead to higher prices and poorer quality of service, including long waiting times (especially during high demand), unkempt cars, and unpleasant service ?
4. What other licensing requirements are included under the existing taxi-licencing regime?
 - a. What barriers do these requirements create ?
 - b. How can these barriers be mitigated ?
 - c. Vancouver : If ride sharing is permitted, do you anticipate changes to or alignment with taxi regulations to ensure consistency and an even playing field ?
 - d. Toronto : With the introduction of PTCs under the vehicle-for-hire regulations, were there changes to or alignment with taxi regulations to ensure consistency and an even playing field ?

Topic D : Carpooling Regulatory Barriers

5. Are there municipal regulations governing carpooling ?
6. Are there regulatory barriers or lack of policy to incent people to carpool ?
 - a. What does the City do to incent people to carpool ?

Topic E : Future expansion of car/ride sharing

1. What are the top 3 regulatory barriers that you foresee to future growth of shared mobility ?
 - a. What will help mitigate those barriers ?
2. What information does the municipality track on the car share and ride share industry, taxis and carpooling? Are you willing to share this information ? E.g. number of users, number of cars operating, etc.
3. Have you established partnerships with the car sharing industry/developers/transit authorities/businesses/universities/other to expand or encourage car sharing options ?
 - a. How can partners play a role in expanding the supply and availability of shared mobility options (e.g., providing incentives and rewards for undertaking sustainable travel habits, marketing, transit integration/discounts, parking) ?
 - b. Do you see other trends emerging in the mobility sector ? E.g. new players ready to enter the market, innovative mobility options complementing the current offer, other trends that are likely to disrupt this market, etc.

APPENDIX B :

OTHER SHARED MOBILITY OPTIONS

It is recognized that shared mobility can include other modes such as bike sharing, peer-to-peer car sharing, public transit and micro-transit. These modes of transportation are an integral part of the shared mobility network and are included in the discussion, however the regulatory barriers specific to these transportation modes were not explored as part of this study given time and budget constraints. In addition, options such as micro-transit are in their infancy and not yet offered in the municipalities studied. A description of each is provided below.

Bike Sharing

Bike sharing provides users with access to bicycles for one time use or riders can become members for more regular use. Users access bikes through a pay station and can choose the length of time they intend to use the bike and return it to any station located throughout the City. Montreal, Toronto and Vancouver all offer public bike sharing programs, with Montreal offering the largest bicycle share system in Canada.

Peer-to-Peer Car Sharing

Another iteration of peer-to-peer sharing is where an individual car owner makes his or her vehicle available for others to rent for short periods of time. This model moves away from the more well known car sharing model that involves a centrally owned and managed fleet. A brokerage company provides the service via a mobile app to match an owner and customer. Currently, Turo is the only company offering this service in Canada, operating in Toronto and Montreal.

Public Transit

Public transit is a shared passenger-transport service available for use by the public based on pre-determined schedules and defined pick-up and drop-off locations. Public transit can include rapid transit, light rail, buses, and ferries.

Micro-Transit

Micro-transit is a new participant in the shared mobility space re-inventing mass transit. Micro-transit is defined as a privately-operated transit system. It offers services like public transit agencies, but is not subjected to the same regulatory constraints, and offers tailored services to match changes in travel behaviour. It typically offers flexible routing, flexible scheduling, or both. Current micro-transit providers include Chariot in San Francisco and Via in Chicago, New York and Washington.

APPENDIX C : REFERENCES

Car2go 2016. Commercial Fact Sheet (July 2016)

City of Vancouver, Street and Traffic By-Law no. 2849 (May 3, 2016)

City of Toronto, Private Transportation Company (PTC) Drivers Fact Sheet

City of Toronto, Private Transportation Companies (PTC) Fact Sheet

City of Toronto, Taxicab Drivers Fact Sheet

City of Toronto Bylaw Bill No. 571

Communauto, 2016. Mémoire de Communauto, Consultation Publique sur la réduction de la dépendance montréalaise aux énergies fossiles VertMTL

Communauto, 2016. Projet de Politique de stationnement de la Ville de Montréal, Mémoire de Communauto

Communauto, 2015. Mémoire sur la Stratégie gouvernementale de développement durable

Shaheen and Martin, 2016. The Impact of Car2go on Vehicle Ownership, Modal Shift, Vehicle Miles Traveled, and Greenhouse Gas Emissions: An Analysis of Five North American Cities

Shaheen and Cohen, 2015. Innovative Mobility Carsharing Outlook. Carsharing Market Overview, Analysis and Trends (Summer 2015). University of California, Berkeley.

Shaheen and Cohen, 2016. Innovative Mobility Carsharing Outlook, Carsharing Market Overview, Analysis and Trends (Winter 2016). University of California, Berkeley.

Shaheen et al., 2015. Shared Mobility, A Sustainability & Technologies Workshop, Definitions, Industry Developments and Early Understanding. University of California, Berkeley.

Shaheen, 2013. Trends and Trajectory of Shared Mobility. AP020 Strategy Day

Shared-Use Mobility Center, 2016, Shared Mobility and the Transformation of Public Transit, March 2016

The Metro Vancouver, 2014. Car Share Study, Summary Booklet

Uber, 2016. Uber Local City Impact in Toronto (Fact sheet)