BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

BRIEFING NOTE FOR INFORMATION

DATE: September 8, 2017

PREPARED FOR: Honourable Claire Trevena, Minister of Transportation and Infrastructure

ISSUE: Taxi Industry Consultation Framework

SUMMARY:

- **The taxi industry is the primary provider of passenger directed transportation services in British Columbia.**
- **Much of the current regulatory regime and legal requirements to operate in B.C. date back decades, with the most recent revision to the legislation coming into effect in 2004.**
- **Changes in technology and meeting consumer expectations for safe, reliable and affordable passenger transportation service require government to assess the existing PT framework** s.13
- **A comprehensive consultation framework is required to identify opportunities to modernize the existing regulatory regime** s.13

BACKGROUND:

The taxi business is an established industry providing point-to-point transportation services in B.C. and is currently the primary provider of vehicle for hire services in B.C. Concurrent municipal and provincial jurisdiction over taxi operations has created a complex regulatory environment for B.C.'s taxi industry with sometimes overlapping or duplicative requirements.
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The Minister of Transportation and Infrastructure's mandate letter directs her to work with the Minister of Public Safety and Solicitor General to create a fair approach to ridesharing and government committed to "work with taxi drivers, taxi companies and ridesharing companies to create a truly fair approach to ridesharing in British Columbia that doesn't unfairly benefit – or punish – one group over the other."

Taxi companies in B.C. are represented by two associations, the BC Taxi Association (BCTA) and the Vancouver Taxi Association (VTA). In addition, the Taxi Drivers' Association of Southern B.C. (Taxi Drivers' Association) represents taxi drivers who are not share or licence holders. s.13,s.16
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DISCUSSION:

A comprehensive consultation with the taxi industry, local governments, consumer and business interest groups will allow government the opportunity to gather the necessary information to consider changes to modernize the existing industry in a way that allows it to remain viable and compete on equal footing should rideshare services be introduced in B.C. Each of these groups could provide government with an understanding of the importance that transportation options affords both industry and the public as well as key themes that are relevant to each group (See Appendix A Stakeholder List).

INDUSTRY EXPERT:

The consultation could be undertaken by a trusted industry expert, Dr. Dan Hara of Hara Associates (see Biography Appendix B). Dr. Hara is conversant with the current passenger transportation regulatory framework in B.C. and has worked with stakeholders in the 2015 *Vehicle for Hire Dialogue* facilitated by the City of Vancouver (see Discussion Paper Introduction Appendix C).

Hara Associates also has previous experience analysing the impacts of ridesharing on the taxi industry in a number of other Canadian jurisdictions. For example, Hara Associates played a key role in the City of Ottawa's 2015 taxi industry review. The review was aligned to the City's guiding principles of safety, accessibility and consumer protection and was conducted in three phases which included research, publishing of discussion papers, consultation and workshops to develop policy option papers, analysis and publishing of a final report to assist the City of Ottawa's decision making process.

The Terms of Reference for the engagement and consultation led by Dr. Hara could include a number of the concerns that the industry and other stakeholders have raised previously including maintaining high safety, insurance and training standards, eliminating overlapping regulatory oversight, ensuring adequate accessible service levels and protecting the investment of licence or shareholders s.13
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TIMELINE AND APPROACH:

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These groups could include:

- Passenger Transportation Board Chair and members
- Taxi Associations (VTA, BCTA)
- Mayors of Vancouver, Victoria and other communities
- Union of BC Municipalities

Milestones for the consultation framework would include:

September 2017:

Communication to general public, industry and stakeholders

Agreement to the Terms of Reference for the consultation and reporting requirements

October – November 2017: Consultation period and analysis

December 2017: Draft report and recommendations provided to Minister and Cabinet for discussion and decision

FINANCIAL IMPLICATIONS:

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A contract may be directly awarded if the contractor is the only one qualified to provide the services. [s.13
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Attachments: APPENDIX A: Vehicle for Hire Consultation Groups
APPENDIX B: Bio: Dr. Dan Hara
APPENDIX C: City of Vancouver Discussion Paper

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APPENDIX A
VEHICLE FOR HIRE CONSULTATION GROUPS

- Vancouver Taxi Association
- BC Taxi Association
- Taxi Drivers' Association of Southern BC
- BC Limousine Association
- Union of BC Municipalities
- Treaty First Nations
- Passenger Transportation Board
- RoadSafetyBC
- Insurance Corporation of British Columbia
- BC Association of Chiefs of Police
- Port Metro Vancouver
- CERES Cruise Terminals
- YVR & other airport operators
- Disability/Accessibility & Seniors Associations
- Justice Institute – Taxi Host Program
- Association of Beverage Licenced Establishments
- BC Hotel Association
- BC Chamber of Commerce
- BC Business Council
- TransLink
- BC Transit

APPENDIX B
BIO: DR. DAN HARA, HARA ASSOCIATES

Dr. Dan Hara has 21 years of experience advising government agencies on regulatory and transportation policy. A specialist in industrial organization, his work has covered many regulatory environments, including taxi regulation.

Hara Associates is a firm of economists that has been working with policy makers and regulators in the United States and Canada since 1987. They provide advice on policy, evaluate programs, and assess economic impacts. Services include public consultation, presentation to elected officials and senior management, benefit/cost, value-for-money audits, and managing change.

Past clients of Hara Associates' Taxi Regulation Program include Los Angeles, Edmonton, Washington, D.C., Halifax, Sudbury, Calgary, Kitchener-Waterloo, and Ottawa-Carleton.

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APPENDIX C
CITY OF VANCOUVER DISCUSSION PAPER - INTRODUCTION

A Framework for Choice:
Discussion Paper on
Future Regulation of Vehicles-for-Hire in Vancouver

A *Vehicle for Hire Dialogue* process was established to respond to a motion of the City of Vancouver of October 1, 2014, and confirmed in a set of understandings reached among the interests the "Ensuring Expectations are Clear" Ground Rules approved and endorsed by all participants in June 2015. The purpose of the process is to provide the opportunity for users, providers, regulators and other stakeholders to exchange ideas and search for new and innovative approaches to address the challenging questions related to the vehicle for hire sector.

Areas of interest identified by the Council motion included:

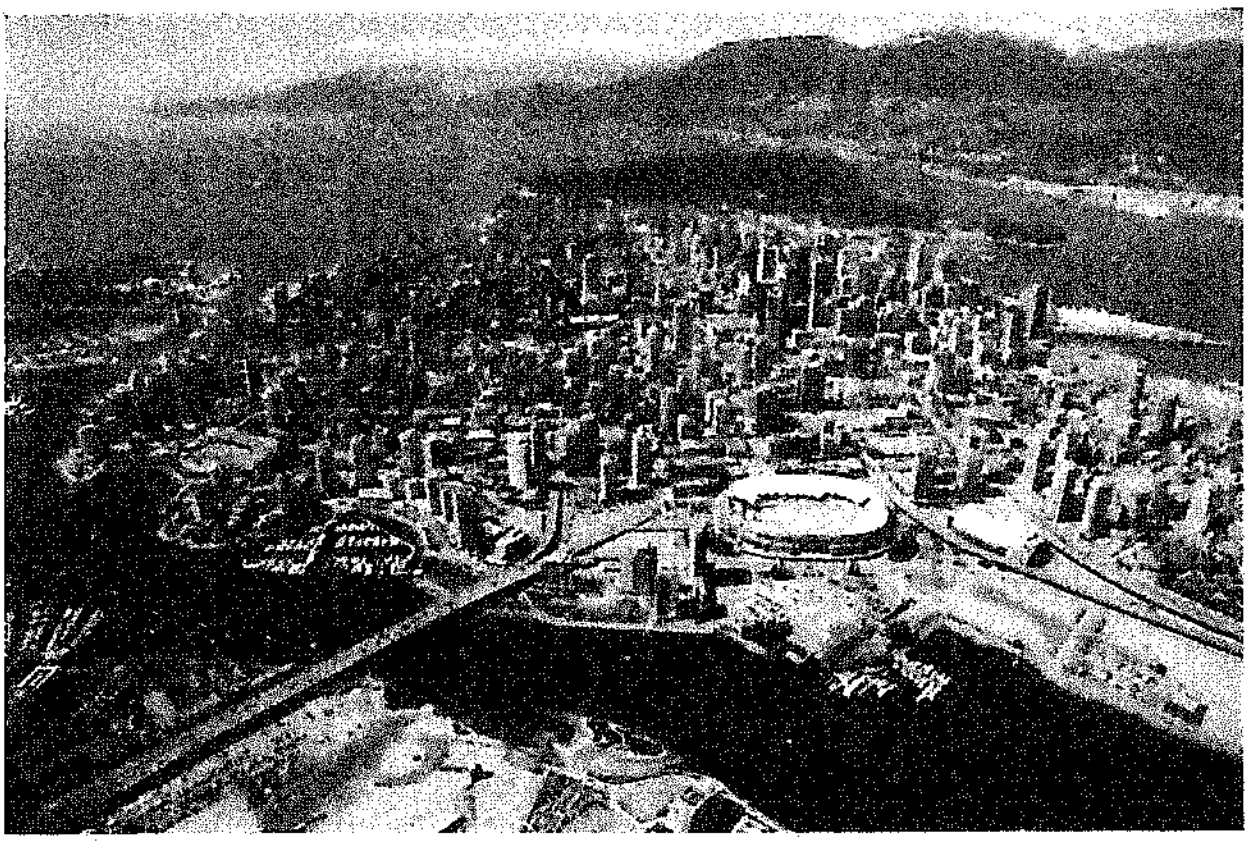
- Measures necessary to expand service, while ensuring the industry responds to the needs of consumers and stakeholders in the tourism, hospitality and the disability community through innovation and best-in class standards for environmental standards, safety and service;
- A process to respond to the Passenger Transportation Board decision to allow 38 taxis from suburban municipalities to work in Vancouver during certain periods;
- The Vancouver Taxi Association's proposal to add 78 full-time accessible taxis to the city fleet, which is now under Passenger Transportation Board review;
- Measures to ensure customers achieve the full benefits of new "ridesharing" technology without undermining the existing industry's standards for safety, accessibility, driver training and green technology.

To support the dialogue and provide a framework for choices, the following discussion paper was developed.

The paper provides some important facts and context to the choices facing the Vancouver area, indicate what additional information would be useful, and to put some order into the different dimensions of choice that currently exist. Also provided is a preliminary assessment of potential market opportunities in the sector.

Framework for Choice: Discussion Paper to Inform and Support Vehicles-for-Hire Dialogue

October 10, 2015



Hara Associates

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[1] In 2012, the PTB authorized a total of 137 taxis to operate on weekend evenings in the Downtown Vancouver Entertainment District, 99 from Vancouver taxi companies and 38 from suburban municipalities. Implementation of this decision has been postponed pending judicial review initiated by Vancouver companies, and pending enabling bylaw amendments by the City of Vancouver. The 99 Vancouver part-time taxis are operating at present under temporary operating permits (TOPs). The 38 suburban taxis are still awaiting the outcome of this process.

Multiple ideas are offered for consideration by the author. None are intended as a preferred recommendation.

1 Needed: A Framework for Choice

The paper defines key choices for participants in a number of policy dimensions, and examines how they are linked. The advantages and disadvantages of various options are discussed, along with their potential impact on stakeholders.

Assessment is undertaken from the perspective of both efficiency and fairness. The opportunities for better public service through new technologies are recognized. The significant investment that current industry players have made in the industry, including that represented by plate values, is also recognized.

To meet the timelines required by the process, analysis is based on data and examples that are readily available. Examples and analysis should be taken as illustrative, rather than conclusive or exhaustive. A variety of ideas are provided, but none are intended as a recommendation.

Defining TNCs

One area of interest in Council's request is the "ridesharing" technology offered by companies such as Uber and Lyft. This paper uses Transportation Network Company (TNC) for these firms. TNCs connect passengers and vehicles using smart-phone applications. The term TNC was coined by the California Public Utilities Commission, the first regulatory body to give TNCs formal recognition and licence to operate.

TNCs may use licensed vehicles-for-hire, or private vehicles driving under personal vehicle and driver licenses. Uber for example, has a number of services. UberBlack uses licensed limousines and is the original Uber service. UberTaxi connects passengers with licensed taxis.

UberX is the service that connects passengers with private vehicles operating outside the regulatory system. UberX is what is usually meant by "shared ride" and is at the centre of policy discussion around TNCs.

Regulatory Roles in Vancouver and British Columbia

Vehicles-for-hire in British Columbia are regulated by more than one authority. The *Passenger Transportation Board (PTB)* issues operating licences to fleets of

"passenger directed vehicles", defining operating areas, terms of service, and number of vehicles permitted. Municipalities have equal authority to license vehicles-for-hire, plus responsibility for setting driver and vehicle requirements. Enforcement, including regular vehicle inspection, is the responsibility of police forces.

2 Organization of the Paper

Before moving to regulatory choices, context and background are provided in four areas.

- **Current technology and data platform for monitoring and enforcement.** Can current dispatch and vehicle technology support more sophisticated licensing regimes, such as vehicles licensed to serve only peak hours? Or to serve specific geographic zones?
- **What is the sharing economy?** How does it relate to the activities of Uber, Lyft, and other Transportation Network Companies (TNCs)?
- **Plate values, Driver Income, and Accessible Taxi Service.** Assessing the impact of change on stakeholders requires an understanding of why plate value (the market value of a taxi plate) exists, and the degree to which it is linked to the related issues of driver income and providing accessible taxi service.
- **Potential Market Opportunities** (in supplemental appendix). Is there room for new market growth that could be developed along with reforms to the vehicle-for-hire regulation? What are the constraints and assumptions behind these estimates?

With the above in mind, policy choices are discussed in these dimensions:

- Part-time Licensing?
- Geo-Fencing & Jurisdiction
- How Many Regimes? Should TNCs be Unique?
- Safety Regimes – the Devil in the Details
- Entry Management and Alternatives to Fixed Caps

Choices are discussed in the context of what is possible, and what is seen in other jurisdictions. Some of the options identified may require changes or in provincial

legislation, or in the current structure of vehicle-for-hire regulation in British Columbia.

3 Context: Data Platforms for Monitoring and Enforcement

Regulations quickly fail if they cannot be practically monitored or enforced. For example:

- **Regional solutions/compromises.** If taxis from surrounding municipalities are permitted to enter the City of Vancouver only at certain hours, there should be a means of monitoring compliance. If there is to be a group of City of Vancouver plates that are not permitted to operate cross-boundary, this too requires a means of monitoring and enforcement.
- **Accommodating TNCs.** If TNCs are viewed as private individuals sharing their vehicles on an occasional or part-time basis, then one potential licensing approach is to limit the number of operating hours to part-time (to avoid full-time taxis operating via TNCs and thereby evading the more stringent set of regulations). Any measure on these lines requires the monitoring of vehicle, driver, and operating hours.

To expand the set of potential compromises and solutions, it would be helpful to know if regulators can potentially monitor where and when vehicles operate, and where and when drivers are operating. Whether regulators actually exercise these capabilities depends on the solutions that cities/regulators require, or stakeholders' desire.

Data platform capabilities are reviewed below. The review is first in the context of taxis, and then for TNCs and other vehicles-for-hire.

Capabilities of Installed Dispatch Systems

Fortunately, the capacity to monitor vehicle activity by time and geography is already largely in place. For more than a decade, reasonable quality computer dispatch systems have been GPS capable, and also linked or linkable to the activity of a taxi meter. These are fundamental requirements of displaying on dispatchers' screens where vehicles are, and whether they are busy. Dispatchers also need to know whether a taxi is active with a passenger that they picked up on street-hail or taxi stand—thus the link to the meter. With this system in place, many trips can be dispatched automatically, leaving the dispatcher to monitor the overall system and cope with problems and exceptions.

The vast majority of taxi companies use systems with these capabilities. When smaller companies do not wish to invest in the equipment and software themselves, there is always the option of contracting with a larger company that answers a separate telephone line with the company name, and monitors and dispatches the fleet as a separate unit. Such service companies need not even be in the same city, provided telephone and internet connections have sufficient bandwidth. For example, the company Coventry Connections dispatches taxis in several widely separated Ontario municipalities.

A reasonable quality dispatch system records:

- Time call placed on system (if dispatch)
- Time released to taxis (if dispatch)
- Time calls accepted by taxi (if dispatch)
- Time meter on (all calls, provided meter-linked)
- Vehicle ID
- Location at meter-on (and perhaps dispatch zone)
- Location at meter-off (and perhaps dispatch zone)

Although the data is recorded, it may not be retained. Companies that do not use this data may not even realize that their systems collect it. To retain the data, it is necessary to create a management report—a job for a contract programmer or an item that can be customized and purchased from the system supplier. Drawing down a custom report from an existing data base is relatively inexpensive and a normal cost of doing business.[2]

While this kind of data has been available for many years, few regulators ask for it.[3] The City of Calgary is an exception. Calgary receives data on all trips taken each month from its licensed taxi brokers. The collection of the data has proved less of a challenge than has its use. Processing and analyzing the reports requires an investment in data management at the regulatory end. Calgary works with the

[2] Hara Associates estimated the cost of implementing reports (where they don't exist) at a conservative one-time $10,000 to $20,000. While significant when viewed as a single expenditure, it amounted to 3 cents per taxi trip for one year—a reasonable price to implement a modern system to monitor the effectiveness of dispatch service to accessible taxi customers, and to all customers during peak periods. *Taxi Supply Demand Ratio for the City of Calgary*
Phase II: Measurable Service Standards. Hara Associates (2012).

[3] Ibid. The survey of peer jurisdictions for this study found only three of eleven other cities collected data as a regular requirement. For two of these, collection was restricted to annual estimates of trip volume.

City's IT department to maintain the data base for analyst use.

An Interrupted Revolution: PIMs and DIMs

From the above, monitoring time and location of taxi operation is a capability largely built into the installed base of current dispatch systems? The identity of the *driver,* or hours worked, is less well tracked. Linking driver identity to data has always been a sensitive topic in the industry.

Tracking driver identity becomes easier once a greater proportion of payments are by credit cards, and payment systems are linked with dispatch. If a driver must swipe an ID to receive automatic payment of credit card charges into their bank account, then a system exists for driver tracking by hours and by trip. Receiving payment in one's bank account also reduces the likelihood of false identification. In addition, when the payment system is linked to the dispatch system, it is linked to the meter. As long as the meter is used, all trips are tracked, credit, debit, or cash.

Examples of fully integrated payment systems are found in a reform initiative pioneered a decade ago by New York and Boston. The intention was to develop a "taxi of the future" that would improve the experience of taxi users, while at the same time laying down a solid data platform for modern regulatory management.

The New York and Boston system(s) do not involve new technology so much as the viable *packaging* of well-established technology. The two cities also established a competitive ecosystem of suppliers available to other cities. Adoption by other cities has been slow, due in part the distraction of another industry event: the advent of TNCs.

While offerings from suppliers continue to advance, the New York and Boston systems remain a good demonstration of how a full data platform can be instituted at little cost to the industry or the regulator. They demonstrate the affordability and feasibility of taxi equipment that allows real-time monitoring of taxi trips, and the linking to driver identity if required for regulations (e.g. maximum hours, or part-time licences). The data linked to drivers is the missing link in most cities installed base of taxi equipment.

The Boston/New York examples also show that data platforms can be

implemented affordably in a way that adds to customer experience, and can facilitate accommodation of visual and hearing disabilities.

Description of New York and Boston Systems

Physically, the New York and Boston systems manifest themselves in vehicles by a Passenger Information Monitor (PIM), and a driver information monitor (DIM). The passenger's monitor includes many convenient features. The system is linked to the GPS so that customers can view their progress, and the route being taken on a map (See Figure 2). The screen is touch sensitive and equipped with sound. Taxi regulations and rates; news, weather, and entertainment; tickets to shows; and other matters, can be accessed on the screen. A key feature is the credit card swipe customers use themselves, rather than handing the card to the driver. This feature is quite popular among users. Credit cards become easier and more secure to use. In theory, the systems are also debit card capable.

The sound and touch screen also allows potential accommodation of people with vision or hearing disabilities. For instance, there is discussion of a "triple-tap" standard that would allow those with impaired vision to activate an audio menu (e.g. voiced meter read).

The driver's monitor is also an important feature of the system. It allows direct communication, including from the regulator (e.g., "Mr. Jones left his wallet on your back seat, please confirm"). *Drivers also must enter or swipe their identification.* This feature is necessitated by the approach to financing the equipment used in New York and Boston.

Under this approach, taxi company operators receive the equipment for free in exchange for a percentage of credit card charges. The usual terms amount to 5% of credit charges, inclusive of the usual percentage taken by credit card services for their service.

The percentage credit card charge is negotiated partly on the basis of the proportion of fares likely to use credit cards, since the system must handle the data burden of all calls by all payment methods. The fee structure may vary. The original flat 5% proved vulnerable to competing smartphone credit card apps, such as Square which charges only 2.75% and provides a free swipe that attaches to the driver's phone). Drivers would take credit cards on their own phones to save money, defeating the purpose of the finance company in providing the PIM

and DfM without charge.

Drivers receive their credit card fares as direct deposits into their bank account, usually the next business day. This feature is popular with drivers and helps counteract the historical resistance of taxi drivers to the use of credit cards. Companies that held back credit card income for 30 days, or charged more than 5% for processing, lose this financial advantage. However, the companies also save administrative costs from not having to process the credit card charges themselves.

Implications for a Data Platform

From a data-platform perspective, the following outcomes are relevant in the New York/Boston example:

- Driver ID is monitored. Drivers have to identify themselves correctly in order to receive their credit card fare revenue by direct deposit. Opportunities for cheating are limited, and require a more intimate trust relationship between drivers.
- All other vehicle time and location data is recorded, as in older systems. In addition, a full GPS *crumb trail* can be recorded if desired in order to monitor the route taken (or to find a missing taxi if a driver is thought to be threatened).
- Regulators receive full trip data information (including crumb-trail if desired) both in real time, and as a file delivered automatically via internet once a month. Real-time access to current and recent trips is provided via a simple computer terminal; secure access to the system is maintained by the credit card service provider. The real-time access can be used as a lost and found service (provided by New York's regulator), or to identify taxis on an enforcement issue (what taxi dropped a customer at 1st and 3rd at 3p.m.?), or simply to spot check the integrity of monthly download files.

Benefits to the ridership, including those with vision and sight disabilities, are also attractive features.

Parallel Capabilities of TNCs and Limousine Companies

The ability to track vehicle and driver by time and geographically is fully replicated in current TNCs. Uber, as a leading example, collects all this information as a necessary part of its UberX business model. Time and distance, as measured by the GPS crumb trails of the customer and driver phones, are used to determine the fare. For TNCs, smartphones replace the meter, and the collection of trip data is central to their business model. The identity of both the customer and the driver is also necessarily tracked for connecting the two parties, and subsequent billing, payment, and rating.

If TNCs are brought into the regulatory regime, the can be asked to share the needed data as a condition of licensing. Uber, for example, has recently executed a data-sharing agreement with Boston.

The necessary capabilities will also be present for new licensed entrants such as *Ripe,* the Vancouver mid-priced limousine service recently authorized by the B.C. Passenger Transportation Board. Like Uber, Ripe uses smartphones in place of a meter.

Traditional limousines are more problematic. Larger companies want to know where their vehicles are on a real-time basis and may use the same software and hardware as taxi companies, or parallel technology using smartphones or personal computers (some taxi companies also use these less expensive hardware platforms). However, in the absence of a meter or distance-based smartphone payment, data on specific trip origin and destination may not be collected. If deemed necessary, however, the addition of such capabilities is not insurmountable. The systems and suppliers are already out there, and for larger limousine companies, the cost is only incremental to systems already in place.

4 Context: The Sharing Economy and TNCs

Another important context is the relationship between TNCs and the *sharing economy.* The internet has enabled and made cost-effective a wider span of transactions than was previously possible. Much of the newly possible is seen collectively as "the sharing economy."

The sharing economy has generated a great deal of public attention. There are many points of view on what it is.

Collaborative work is one theme. A common example is the Linux computer operating system. It was developed largely on a collaborative basis as a viable alternative to Microsoft Windows, or Apple's operating system. Certified reliable versions can be purchased on a consumer or business basis from a variety of sources. However, the core effort remains one of shared copyright and shared effort by users who felt they would collectively benefit from the work.

Mixed sharing/market economy efforts are also part of the idea. eBay is often considered to be an example of the sharing economy, although its business is private buying and selling. The sharing aspect of eBay is its pioneering use of user reviews and ratings. These are the net collaborative effort of many unpaid users, who collectively share the benefits of the body of shared information, which has an immediate effect on the reputation (and behaviour) of buyers and sellers.

Uber, Lyft, and others market themselves as *shared ride services*, an enablement of the sharing economy. This vision is important to understanding the success of their business models, as well as the social legitimation that persuades many that

operating a vehicle-for-hire outside the regulatory system is a right and revolutionary thing to do.

Understanding the challenge such a vision presents to existing systems is necessary to any consideration of public policy and/or political changes undertaken to reform current systems.

How much of the operation of Uber and other TNCs is "sharing economy?" We may consider sharing at different levels.

- **Shared trip.** If you have to go shopping downtown, why not take someone else with you so that the two trips are combined? You get some expenses back, and less greenhouse gases are generated. This is perhaps the purest notion of a shared ride. You can do this with through Uber or Lyft, but itis not a common practice. Another San Francisco company, SideCar, attempted to make this form of sharing its principal model. That company has since shifted its focus to parcel delivery.

  From time to time, Uber has experimented by offering a version of a shared ride by offering two or more customers a reduced rate if they agree to share a trip with others.[4] Traditional taxis are also capable of offering this kind of shared ride, if regulations allow. Washington DC historically has allowed taxis to act as multi-passenger jitneys during rush hours. Madison, Wisconsin, has for many years offered dispatched shared rides with lower fares based on a zone system.

- **Shared vehicle.** You have a vehicle for personal use. You have time to spare during which you would like to earn money. Why not share your vehicle and get paid? Isn't this a more efficient use of society's resources—of both the vehicle and yourself?

  The distinction between this approach and regular taxi service is not as clear as it may initially appear. In the public mind, a well-marked taxi appears to be corporate vehicle and the taxi driver an employee of that corporation (working on commission perhaps). However, the markings are the result of regulation, and the driver may in fact own their own vehicle.

  In single-shifted jurisdictions, the marked taxi may also be the taxi driver's personal vehicle once the top-light is turned off or removed. Thus, if one driver works 50 hours a week cruising for Uber, and another works a

[4] Uber offered a shared rate in the Ottawa market for a period of time. Anecdotal evidence suggests it was not heavily used. Participants got a lower rate but often ended up being the only person in the vehicle.

licensed taxi for the same hours, there is little distinction between the two except for adherence to regulations.

Part-time drivers may more closely fit the sharing economy vision. The part-time driver making a few dollars on the side might be using capacity that would otherwise go unused, as opposed to displacing a licensed driver.

The City of Seattle originally considered a limit of 16 hours per week for drivers who registered themselves under TNCs. This hourly limit appears to have been dropped from posted regulations. The reasons for dropping the hourly limit are not clear at this stage of review, but may be related to the lack of a necessary enforcement data platform (see data platform discussions above).

- **Shared experience data.** The collaborative aspects of the driver and passenger rating system are part of the sharing economy. Some may find this method more functional than tipping; a process that many feel is an obligation rather than a means to express satisfaction or concern. Younger people are especially prone to feel this way.

How we view the sharing economy role of TNCs affects whether or not there is a need to accommodate a separate class of providers or to simply regard them as an alternative dispatch system for the same service.

5 Context: Taxi Plate Values, Driver Income & Accessible Service

To understand who is vulnerable to change in vehicle-for-hire regulation, it is necessary to understand plate value. Like most jurisdictions, the number of taxis permitted to operate is limited, and the right to operate (the "plate" or in New York, the medallion) has acquired a significant market value that is separate from the value of the vehicle, or of the taxi company.

Regardless of the origin of plate value, many current stakeholders may have paid hundreds of thousands of dollars to acquire a plate, and face ruin if rule changes eliminate their value. This will include drivers who saved many years to acquire a plate, own their own business, and fully commit to the industry. In the City of Vancouver, the cooperative organization of taxi companies means a larger number of these owner-drivers.

The issue of plate value is also linked to two other issues: driver income and how cities provide incentives for accessible taxi service.

Policy Roots of Plate Value

Plate value comes from the limitation on the number of taxis permitted to operate. Capping the number of taxis has been part of taxi regulation for quite a while. In the 1600s both Paris and London licensed and limited the number of hackneys, horse-drawn carriages offering taxi service. During the Great Depression of the 1930s masses of unemployed sought to become taxi drivers, creating significant problems and causing many cities to cap the total number of taxis permitted. The following 1933 editorial from the *Washington Post* illustrates civic reaction to the flood of taxis caused by the great depression:

> "Cut throat competition in business of this kind always produces chaos. Drivers are working as long as sixteen hours per day, in their desperate attempt to eke out a living. Cabs are allowed to go unrepaired . . .
>
> Together with the rise in the accident rate there has been a sharp decline in the financial responsibility of taxicab operators. Too frequently the victims of taxicab accidents must bear the loss because the operator has no resources of his own and no liability insurance. There is no excuse for a city exposing its peoples to such dangers."[5]

The relationship between capping taxi numbers and excess entry is generally recognized. *The Economist,* a news magazine generally favouring open markets, had this to say in reviewing recent regulatory reforms "*... On paper, competition should flourish. But low barriers to entry create the risk of having too many drivers on the road. The number of taxi drivers in New York and Washington, DC, shot up between 1930 and 1932, as the unemployed sought work during the Depression. Such surges lead to rules to reduce congestion.*"[6]

Once the number of taxis is limited, there is a tendency for regulators to fall behind in adjusting the cap to reflect civic growth and increased in demand. The existing taxis become busier at the expense of longer customer wait times at peak periods, and the value of the right to operate (the plate) begins to rise.

[5] Taxicab Chaos. *Washington Post*, Jan. 25, 1933. Via Dempsey *Supra*
[6] A fare fight. *The Economist*. Feb. 11, 2012. Pg. 76

Once plate values become established at high levels, they are difficult to reverse because of consequences for those who may have bought into the industry at full price.

Moving back to an open-entry model also has a record of failure. This is discussed under alternative choices for entry management, further below.

Plate Value May Sometimes Recover and *Increase* with more Taxis

In the present debate, the concern is that an increase in the number of taxis to serve peaks, or the introduction of an effectively unlimited regime in the form of TNCs, will drive plate value of traditional taxi licenses down. If the expansion in competing supply is unlimited – the plate value can be reduced to zero.[7]

However, within a managed entry regime, it is also possible that an expansion in the number of vehicles-for-hire licensed to operate can result in an *increase* in plate value. This situation can occur when a cities market is underserved to the point that the current industry is not serving segments of the market. For example, taxi service may be concentrated in the urban core, leaving outlying regions without reliable service. This was arguably the case for San Francisco which provided fertile ground for the origin of Uber and Lyft.

A practical example of plate values increasing with expansion can be found in the history of Boston. After many decades limiting the number of medallions at 1,525, Boston authorized an additional 300 medallions, an approximate 20% increase. The first forty of these were issued quickly to wheelchair accessible vehicles, and the remaining 260 were auctioned off over five years, from 1999 to 2003. Despite a significant increase in medallion numbers, medallion prices soon increased above their pre-1999 levels. Historical evidence suggests that Boston medallions were worth $32,000 in 1983[8] and $95,000 in 1995[9]. Transfer records beginning in 2000 show average medallion prices starting at $184K and rising to $434K by 2011. This increase occurred as the medallion expansion took place, and despite

[7] Plate value is driven by the willingness to pay to enter an industry that is more profitable than normal. Normal profits mean no one will pay extra enter the industry.

[8] Frankena, Mark W., and Pautler, Paul A., *An Economic Analysis of Taxicab Regulation*, Federal Trade Commission Bureau of Economics Staff Report, May 1984, available at http://www.ftc.gov/be/econrpt/233832.pdf retrieved 24 August 2012.

[9] Government of the District of Columbia, "Taxi Medallion Systems", Memorandum from Fitzroy Lee, Deputy Chief Financial Officer, to Neil O. Albert, City Administrator, January 4, 2010, available at http://cfo.dc.gov/cfo/lib/cfo/taxicab_medallion_memo_jan4.pdf retrieved 24 August 2012.

the general slowdown in travel and tourism caused by the September 11 attacks.[10]

A similar story played out in Toronto. After an industry review in 1998, Toronto resolved to issue 1,313 non-transferrable, non-assignable, and non-leasable single operator permits, termed "Ambassador Plates," which they issued from 1999 to 2005. This represented an increase of 38% of taxis at peak (less at other times due to the single operator requirement). Medallion values fell initially from approximately $63K to $41K in 2000, but swiftly recovered to above $63K in 2002. Medallion value continued to grow, to values of above $200K before being overtaken by the consequences of Uber's entry into the Toronto market.[11]

When portions of the market are not served, expansion can lead to a parallel expansion in demand, and the higher density of general use may also lead to a more profitable industry.

Driver Income Separate, But Affected by Plate Values

The benefit of high plate values goes to the holder of the plate. That holder receives lease payments or shift payments for the use of the plate. A driver may own their own vehicle, and pay all their own costs, but be leasing a plate (less common in the City of Vancouver). Where legal, the plate lease may be identifiable as a separate charge. If not, the value may be implicitly bundled with other services.

Thus driver income is separate from plate values, except in municipalities where large numbers of drivers take both roles: they possess their own plate. When the profitability of the industry falls, drivers take an initial hit as the lease arrangements lag in their adjustment. Over-time the market pressure forces plate leases payments down, with a consequent fall in plate value. (Plate holders who try to resist will end up with a poorer selection of drivers). In the longer run, driver net incomes are restored to their previous levels. The lease rate will have fallen to make up for the drop in gross revenue per taxi for most drivers.

However, there is an important exception.

One image of the taxi driver is that of an individual who works long hours for little return. The public has strong sympathy for the low income taxi driver, and municipalities often make policy decisions based on this driver's situation.

[10] Boston Police Department

[11] Toronto Taxicab Industry Review, *Preliminary Report*. September, 2012.

There is also another image of the taxi driver as a skilled individual who knows where and when to locate themselves to get the best fares, and who does relatively well compared to their peers.

Both images are true. A substantial number of taxi drivers earn low income. However, a sub-set of drivers are a highly skilled group that do better than their peers. Modern technology makes the full monitoring of driver earnings possible, in jurisdictions that permit it. A study of modern taxi service in China found skilled drivers routinely grossed more than 50% more than the average driver.[12] Since they shared similar expenses, the advantage on net income was even higher. The high income drivers where characterized by strategies that kept them out of airport and hotel line-ups. Each had their own unique strategy of timing and location that they repeated daily or weekly.

It can be shown that the skilled drivers are affected by plate value, even if they do not hold a plate.[13] The more restricted plates are, the greater the rewards to those with specialized skill in making use of the scarce plate.

Why Drivers Protest TNCs

The above explains why newspaper headlines are about taxi drivers protesting TNCs, rather than about protests of taxi owners or plate holders. It is not inaccurate reporting. All taxi drivers are temporarily affected by the loss of business revenue to TNC drivers, until plate lease values fall to compensate. In addition, the incomes of the longer serving skilled taxi drivers are under threat, whether they possess a taxi plate or not.

At the same time, not all drivers oppose TNCs. Taxi drivers who do not have a taxi plate are often frustrated by the high price to get one under existing regimes. These drivers can move easily between TNC driving and taxi driving, and may see TNCs as their solution to a regime that keeps them on the bottom rung. When UberX began operations in San Francisco, there was a shortage of shift-taxi-drivers[14] as some quit the taxi companies in favor of driving for Uber.

TNC Driver Income also a Concern

[12] Liu, Liang, Clio Andris, Assaf Biderman and Carlo Ratti. "Revealing Taxi Driver's Mobility Intelligence through His Trace." Movement-Aware Applications for Sustainable Mobility: Technologies and Approaches. IGI Global, 2010. 105-120. Web. 30 Jul. 2012. doi:10.4018/978-1-61520-769-5.ch007

[13] *Taxicab Regulation and Taxi Driver Income.* Hara Associates (2012). Taxicab Inquiry (State of Victoria, Australia).

[14] In San Francisco, most plates are held by individual active drivers. However, another driver needs to take the second shift if the taxi is to be in full operation.

Driver income issues are not unique to taxi drivers. The same market dynamics that driver taxi driver incomes down also apply to TNC drivers. TNCs drivers who are "first-in" may experience good returns, but once a situation stabilizes, easy market entry and the potential role as a residual employer in recessions may be expected to lead to the same results. The number of TNC drivers will expand, until the share of income of each TNC driver income will equalize with the low incomes experienced by taxi drivers. The exception, as with taxis, is the minority who are specially skilled. As they work with TNCs over time, drivers also begin to realize the higher rates of vehicle depreciation and operating costs from commercial operations. Rates that used to seem attractive seem less so once the hidden costs begin to reveal themselves. Turnover among TNC drivers is high - Uber reports that the average active tenure of a Toronto Uber driver is three months. In longer standing jurisdictions, such as California, drivers are pursuing court action to be recognized as employees.

The common income issue between taxi and TNC drivers has implications for long run policy. For example, if the industry is opened up to unlimited TNC service then it may not be long before history repeats itself. In the next economic recession, drivers may mount a process asking that the industry be closed again to protect against excess entry. It is likely that drivers making this demand would include both taxi drivers and TNC drivers.

Accessible Taxi Service May Rely on Plate Value

City policy to promote accessible on-demand taxi service often implicitly relies on the existence of taxi plate value. The provision of accessible taxi service costs more than regular taxi service. A van customized for wheel-chair access may cost on the order of $45,000, compared to the normal used vehicle entering taxi service at $10,000 or less. Serving the actual fares also involves more time to safely secure the passenger. When accessible taxis are only a small part of the fleet, there is also the greater time spent going across town to serve some of the requests. Some of this extra cost can be offset by individual drivers cultivating a private customer base of persons using mobility devices (e.g. they call via cell phone), or by premiums paid to large capacity vehicles (e.g. airport requests for groups with significant luggage). On balance, the industry still sees providing accessible taxi service as more expensive.

There is also the general expectation that persons using mobility devices should not pay any more than other customers for a ride. The net result is that the

industry is expected to absorb the cost. In Ontario, this is the law for all municipalities.

Since the industry is organized as separate contractors, this usually means that the extra cost is borne entirely by the operator of the accessible taxi. Under these circumstances, individual operators will not step forward unless there is some off-setting incentive. The off-setting incentive is usually the plate itself. Operators don't mind spending 45,000 more on a vehicle, if it comes with a taxi plate worth $200,000 or more.

Thus city policy may implicitly rely on plate value to work. If rules are adopted which eliminate plate value, then consideration must be given to how accessible taxi service will be provided without charging extra fees to passengers who use mobility devices. Individual vehicle-for-hire operators cannot be compelled to operate at a loss.

We should also note the potential confusion between on-demand accessible taxi service at taxi fares, and the public transportation provided by TransLink at public transit fares. Under current arrangements, both may draw on the same fleet of taxis and drivers, but they are substantially different services. Persons with disabilities feel they have the right to both. Use of taxis by TransLink does not remove the question of how accessible on-demand taxi service will be provided.

6 Choices: Part-time or Not?

Before engaging in the TNC issues, there are broader public choices to be made. One is whether we introduce and begin to relay on part-time licenses. Vancouver has already begun to do so.

This issue is primarily about taxis. However, it is also a choice for regimes involving the new TNCs, and may also be relevant for Vancouver area limousines since their numbers are also subject to limits set by the BC Passenger Transportation Boards.

Part-time licensing is highly relevant to how we meet peak-load demand. In the traditional model, affordable vehicle-for-hire is provided by taxis, which are limited in number. At peak, such as weekend evenings, this number may be insufficient. At bar-closing for example, individuals may have to wait as the fleet makes several trips between the entertainment area and residential areas.

Part-time licensing would enable the fleet to more flexibly vary in size to meet demand. It has been rarely used because of enforcement issues. After the vehicle

has been licensed and equipped, how do you restrict the hours? If you don't restrict hours, then there is concerns that additional taxis may ply their trade during the day, with resulting oversupply and declining incomes for all taxis. While operators may still find drivers to fill the seats – these drivers may not be the drivers the city wants. Committed skilled operators may seek employment in other industries, resulting in poorer customer service.

The City of Las Vegas has in the past been an exception that proved the rule. Las Vegas maintained for many years a set of taxi plates that were restricted both in the times they operated and in the geographic zones. A key concern was to avoid too many taxis on the Las Vegas strip and downtown during the evening hours. Too many vehicles pursuing the tourist business contributed to traffic jams. Las Vegas enforced its rules with a large number of on-street inspection staff. They were able to afford this because of a tax per trip on the meter, and the importance of the industry to the city's tourism. Most cities cannot afford this level of on-street physical presence of inspectors. With modern technology, there are alternatives.

As discussed under data platform, the installed base of modern equipment is now capable of fully monitoring where and when a vehicle for hire operates. Part-time licensing is now feasible to enforce without excessive administration, provided vehicles are registered with companies (traditional or TNC) who in turn comply with data sharing requirements of the regulators.

Thus, any large municipality now has the option to license vehicles on a part-time basis, and economically enforce these restrictions.

This option has become more important as Canada's culture changes. Taxi use is up as people avoid drinking and driving. Younger generations are also reducing their vehicle ownership, using public transit for most transit – but taxis when going out for an evening's entertainment. This shift increases the difference between peak load demands, and demand during the balance of the week.

If we wish to accommodate peak demand while protecting the viability and quality of service at other times, then part-time licensing offers one solution. San Francisco has initiated an experiment of part-time licensing on a different basis. With some experimental licenses, the total number of hours is restricted, but the operators are free to allocate themselves to where they see the demand – and may be more efficient at covering shifting peaks than a fixed rule set by the regulator.

7 Choices: Geo-Fencing and Jurisdiction

The term geo-fencing refers to geographic restrictions on where a licensed vehicle may pick up a fare, possibly in conjunction with time restrictions.

Again, currently available equipment makes this kind of restriction feasible to economically enforce, if all providers are registered with the regulator.

From the perspective of solving peak-period shortages, the geo-fencing can be used to bring in supply from surrounding jurisdictions during specified periods. If supply is available elsewhere, geo-fencing is a potential alternative, or complement, to adding part-time supply.

Examples of geo-fencing options include the approach mandated by the PTB to allow a number of suburban licensed taxis to serve Vancouver's downtown during weekend evenings. Another example is the idea of City Cabs circulated by the VTA, where a class of city licensed vehicles would be restricted to operating within City of Vancouver boundaries.[15]

Historically, police in Vancouver have employed rough and ready geo-fencing to clear out downtown at bar-closing. Police in metropolitan downtowns face a public safety challenge every weekend when the entertainment closes down. The police have a responsibility to see that crowds disperse, and all get home safely. In previous years, Vancouver police have coped by inviting suburban cabs to come into designated street areas and pick up without penalty, although not formally licensed to do so.

Identifying the span of choices generically, they include:

- **General reciprocity.** A common arrangement is for municipalities to allow other municipality-licensed taxis to drop-off passengers, but not to pick them up. This is in practice in the Vancouver area.
- **Regionalization.** Another approach is to unite the regional jurisdiction and let all licensed vehicles operate freely within the area. The advantage of this is that it eliminates dead-head trips (empty taxis returning to their jurisdiction) and allows the fleet to re-distribute to where demand is located.

  The downside, for some, is that it results in plate values equalizing between the various jurisdictions. Plate holders in high plate value municipalities will

[15] Who would operate such vehicles, the city or licensees, is a separate issue.

see significant losses, while plate holders in lower plate value municipalities will see significant gains. This outcome raises significant fairness issues.

Along with the equalization of plate values comes a rebalancing of service levels. As vehicles-for-hire move to the busier areas, service there improves, while service in other areas declines, until a new equilibrium is reached where profitability of vehicles is consistent across all parts of the region.

- **Cross-boundary permission for one or more existing licence group.** An example in the Vancouver area is the PTB granting the licence application permitting a limited number of suburban taxis to serve downtown at weekend peak hours. This form of solution reduces income to downtown taxis, and increases income to suburban taxis. Another example, may occur when a geographically remote part of one municipality is more efficiently served by a neighboring municipality (this has occurred in the past in San Francisco).

- **Specific Reciprocity.** This extends geo-graphic fencing on quid-pro-quo basis between jurisdictions. For example, if the suburban taxis are permitted to pick-up late evening fares from downtown, a reciprocal approach would allow City of Vancouver taxis to share in the earlier peak of suburban customers coming to downtown night spots. Routes to achieve this include agreements between municipalities, or an application to the PTB by current Vancouver companies under the present regulatory system.

- **New class of regional licensing.** Another approach is to open or convert part of the region's fleet to a class of taxis that can operate freely across the region. For example, as of 2012, Seattle licensed 688 taxis for the City of Seattle, of which 351 are co-licensed by neighbouring King County for regional wide operation. King County also licenses and additional 241 taxis for operation within its own boundaries.

  In this approach, there is room for negotiation on how many of the regional taxis are supplied from each jurisdiction.

8 Choices: How Many Regimes? Should TNCs be Unique?

Classic vehicle-for-hire regulation establishes two regimes, one for taxis and another for limousines. Taxis are usually subject to stricter regimes for inspection, equipment, record-keeping and training. Limousines are deemed a luxury market service, where customers are expected to fend more for themselves. The two

markets are kept separate by measures such as higher minimum fare requirements for limousines, advance booking requirements, and/or requiring more expensive model vehicles. One reason to keep the regime separate is to prevent a taxi-like service from evading stricter oversight through operation as a limousine.

With distinct products, the taxi and limousine markets co-exist. Profitability in the taxi market can be high, even if limousines are not limited in number.

With advent of TNCs, regulators have struggled with how to bring operators into the regulatory fold. Are they just another form of dispatch, to be subject to the same regulations? Or are they fundamentally different and should be subject to a different regulatory regime?

Regulators have made different choices.

- Waterloo Ontario has drafted a new bylaw creating a separate set of definitions to cover TNCs, but requires them to meet the same set of regulations as other vehicles-for-hire.
- The US State of North Carolina has taken the opposite approach, passing state legislation that sets regulatory requirements essentially recognizing Uber's current business model.
- The BC Passenger Transportation Board has set a third possible path: it has licensed a smart-phone metered dispatch service priced midway between taxis and other limousines (e.g. Ripe Holdings). The licence requires a higher class of vehicle than normally used by taxis. It is closer to Uber's limousine offering than to UberX.

The fundamental questions are: Are taxis and TNCs different enough that they could co-exist as separate markets? Should they be allowed to?

Part of the decision rests on how we visualize and define TNCs. If we see a TNC driver as an individual sharing their vehicle on a part-time basis as part of the sharing economy, then the product may be materially different and taxis may survive the competitive challenge. If we see TNCs as individuals working long hours like a taxi driver, then there may not be a material difference between the two drivers other than the cost of meeting presumably wise regulations. As discussed above, both kinds of drivers exist under unregulated TNCs.

The Pitfall of Too Many Regimes – Failure of De-regulation in the 1970's

A danger, demonstrated by history, is that it is possible to have too much choice in vehicles for hire. The 1970's saw the well-documented case of nine US cities experimenting with deregulation.[16] Proponents expected that, without limits on meter rates or service, competition would result in a wider variety of service at cheaper prices.

Surprisingly, the opposite occurred. Dispatch firms in particular found it hard to maintain market share and each began to price themselves upwards into a niche. As the companies became smaller, shortages also appeared on the street, with longer line-ups at taxi stands. In the end, prices rose and service availability fell. The majority of jurisdictions returned to regulating taxi numbers, meter rates, and various safety requirements.

Reasons for deregulation failure are subject to ongoing debate, but it remains an observable lesson. If too much choice is allowed, the industry risks fragmentation into choices that are too small and fail to survive. The result is the opposite of desired: less choice and higher prices.

As a result, the decision to add a market segment requires careful consideration. Each defined regime should be sustainable and able to coexist with the others.

Sustainability, Universal Service, and Accessible Service

In considering the sustainability of separate regimes for taxis and TNCs, one also needs to make decisions about how social expectations we currently place on our taxi industry will be sustained. Two key expectations are:

- **Universality.** Regulations normally require taxis to accept any ride without discrimination – other than listed exceptions such as customers who are falling-down drunk. Cash must also be accepted. These expectations are not usually placed on limousine licensees. It is the taxis that we see as public transport.

  In contrast, the TNCs business model relies on credit cards to facilitate transactions and identity, and trip acceptance is voluntary. If this business model is extended into regulation, then the taxi regime is left with an increasing proportion of the more difficult fares, while the higher income fares with credit cards move to TNCs.

- **Accessibility.** All jurisdictions are striving to improve their wheelchair

[16] Roger F. Teal and Mary Berglund. The impacts of taxicab regulation in the USA. *Journal of Transport Economics and Policy* .Vol. 21, No. 1 (Jan., 1987), pp. 37-56.

accessible vehicle-for-hire service. Expectations tend to focus on taxis, rather than limousines, through a combination of regulation and incentives. As discussed earlier, the incentives for providing accessible taxis often implicitly rely on the value of the taxi plate, which in turn relies on the continued profitability of taxis.

The creation of a separate regime for TNCs would raise the question of how TNCs would meet accessible transportation needs. Uber offers Uber Access in some jurisdictions, but the extra cost of the service must be paid by someone. In Toronto, where provincial law requires no extra charge, Uber Access is currently provided through licensed accessible taxis under the UberTaxi service. Such service is not available via UberX.

Neither of the above points is insurmountable, but how they are treated needs explicit consideration if establishing a special regime for TNCs. Otherwise we will continue to place our expectations on one market segment, while introducing a new segment to compete at lower prices without that burden. Expectations may not be sustainable.

Potential accommodations include the use of debit cards, social assistance swipe cards, and fees per ride collected and used to subsidize accessible service.

The technical feasibility of collecting a fee per trip using modern technology has been demonstrated in Washington D.C., where the DC Taxicab Commission is funded since 2014 by a 25 cent fee per trip. The funds are collected automatically electronically. The Commission required all taxis to acquire a modern meter that could accept credit cards, along with required affiliation to either a Payment Services Provider (e.g. VeriFone, Creative Mobile Technologies), or a Digital Dispatch Service (e.g. Uber Taxi). Both of the latte categories also require a licence from the Commission. Fees are collected electronically for all fares (not just credit card fares) and deposited in the Commission accounts.[17] The system is automatic and paperless.

9 Choices: Safety Regimes – the Devil in the Details

Another way to approach regime choice is to review the principal regulatory requirements and ask, for each one:

- Would a separate TNC regime require this?

[17] In practical terms, drivers have their credit card trips deposited directly in their accounts. They also owe 25 cents per trip for all trips – as tracked by the system link to the meter. The cumulative per trip fee is deducted from the amount they are owed on credit card charges.

- Should we still require taxis to meet this requirement if they are to compete with TNCs?

For example, as part of its current regulatory review, Toronto is considering whether the regulatory burden placed on taxis can be lightened in order to meet competition by TNCs.

A review of requirements might conclude that a lesser safety regime for TNCs is acceptable. Alternatively, it might be found that the core safety requirements are such that all vehicles-for-hire should meet the same basic standards. In that case a unified regulatory regime may be preferred.

In any event, requiring all players to meet safety standard would help level the playing field between traditional vehicle-for-hire providers and TNCs. As noted below, insurance coverage alone creates significance cost differences.

Any review should consider that any regulatory niche that is created is open to new players, not just those currently active. Uber, for example, is well capitalized and has acquired a degree of trust. A TNC niche should anticipate future participants as well. An internet app can be based anywhere in the world, enlist its drivers through the internet, and advertise to local markets on a targeted basis.

Some key regulatory requirements are analyzed below for their rationale and current relevance.

Driver – Criminal Record Check

The choice is not just what to check, but who checks it. In most jurisdictions, taxi companies do not conduct this check themselves. There is a conflict of interest. Taxi companies get their revenue from drivers and operators, and want to fill any empty seats. TNCs experience the same conflict of interest. Thus the final decision on criminal records usually rests with the Chief Taxi Inspector or equivalent.

Conflict of interest is material because the decision requires judgement. It is not as simple as saying having a criminal record means you cannot drive. An individual with a marijuana conviction from twenty years ago might have the right to be considered. There also in-between cases that require careful judgement.

Criminal record checks also vary by level, from a check for convictions to a *vulnerable sector* check that looks at pending cases, pardons, and other records.

At present, TNCs like Uber perform their own criminal record checks, usually by contracting to private services. Although the private service is a 3rd party, it is still being paid by the TNC. The independence is less than that of the regulator. Access to individual's criminal record data by third parties other than the applicant and the regulator is also a privacy and civil rights policy issue.

Driver Testing and Training

Is feedback received by TNC drivers through ratings by passengers more effective than formal taxi driver training and feedback received through tips?

Do drivers still need city knowledge with GPS available and Google reporting of traffic speed by route? What about training on how to serve the elderly, or persons with disabilities?

Requirements for taxi drivers vary widely by jurisdiction, from half-day sessions to weeks of training. Some jurisdictions, such as Toronto, have sought to address driver income issues by professionalizing the occupation with extensive training requirements.

Whatever the training levels required – should the same training and testing apply to TNC drivers?

Insurance

The cost of commercial insurance coverage accounts for much of the cost difference between taxis and TNCs. The cost, on the order of $1,000 per month

per vehicle, is a major contributor to the lower prices of TNCs. However, TNCs insurance leaves a gap – a driver using their personal insurance does not cover passengers, themselves, or third parties when operating commercially. Better TNCs, such as Uber, do carry policies that offer coverage in some circumstances. The terms of coverage are not known because the policies are not public (a common insurance industry practice). The Alberta Commissioner of Insurance has reviewed the issue and issued a warning regarding Uber.[18]

What insurance requirements should be required from TNC drivers and TNC companies?

Dispatch Only? Or Hail?

Much of the safety measures required of taxis are in consideration of picking up customers hailing from the street or arriving at a taxi stand. Both drivers and passengers need a safe framework for strangers meeting strangers.

TNC activity is usually thought of as dispatch. The distinction is slightly blurred since it can also be viewed as an "electronic thumb" for hailing in downtown street conditions. A measure of security is provided by the smart-phones, since the system transaction records includes the identity of the driver and the passenger (through the phones) and where the vehicle goes (via the phone GPS). This is not the same as having a camera in the taxi with a secure encrypted recording – but it is much better than hitch-hiking.

This level of safety requires that the TNCs systems be used. If TNC drivers start picking up hail traffic, then an environment occurs where predators also begin to cruise for and passengers will be less safe. This risk is quite real, as highlighted by a recent Ottawa case where a sexual predator took advantage of the practice of bandit taxis operating at bar closing to pick-up and victimize women.

A key choice for any regime governing TNCs is to limit them to dispatch (or equivalent), and forbid street hail pick-ups. Enforcement here can be challenging. It requires, at minimum, that the TNC operators be registered with the regulator and have their records open to checking. Vehicle markings are also at issue (see below).

In cities like New York and San Francisco, the TNCs operate in the dispatch market only, and co-exist with taxis and other vehicles-for-hire which may do both. Plate value is depressed by the competition, but continues to exist. Whether dispatch

[18] http://www.finance.alberta.ca/publications/insurance/Superintendent-of-Insurance-Bulletin-02-2015.pdf

taxis in suburban areas can survive the competition depends on how level the playing field, since suburban markets are largely dispatch based.

Vehicle Markings and Identification

Taxis look very different around the world, yet also look recognizably the same (see picture of El Salvador Vehicle for Hire). Taxis are marked with designated colors, and numbered to see at a distance. Limousines are less marked, but still bear special numbering and a special licence plate.

The universality of this approach is for safety and enforcement. It is not just to identify individual licensed vehicles. When all licensed vehicles are marked, it is easier to identify illegal vehicles. For example, if you paint an illegal vehicle to look like a Purple Cow Taxi and give it number 52, it will be difficult to hide once people are looking for you. Plus members of the Purple Cow fleet will see you on the road and know you are not the regular driver of 52. They will notify dispatch or perhaps even block the vehicle. The cooperation and oversight of the licensed vehicles themselves is part of what makes enforcement work. All of this places a barrier to illegal operation, and provides regular customers a means of recognizing a licensed vehicle.

To what extent should TNC vehicles be marked, if permitted to operate? One can envisage removable plate holders in the window, or magnetic stickers – but their very convenience undermines the purpose of the systems. Markings can be discrete, but they should not be easily removed or it is too difficult to fake and then to disappear.

Limousine markings are typically more discrete. However the limitation on the class of vehicle also means there are fewer to monitor, and their operations are easier to identify on the street.

Cameras

Requiring taxi cameras is a relatively new safety practice. They are quite capable. Most models can see in the dark (infra-red), are high resolution, and can record sound. Privacy concerns can be met through auto-wipe provisions encryption, and

police access codes. The record can be kept secure and encrypted in fire-proof recorders in the body of the vehicle.

The camera protects both drivers and passengers by showing what happened inside the vehicle. In addition to helping with investigation, the presence of the camera measurably reduces the occurrence of incidents. One study estimated that taxi driver homicide rates were 7 times lower for cities that required taxi cameras.[19] For customer complaints, the camera in combination with GPS records can identify allow identification and investigation of the incident within hours. This also protects drivers from false accusations.

Cameras and recording equipment are a material expense. Should they be required of a TNC class of service? If not, should taxis be still be required to carry this cost?

Driver Safety Equipment

In addition to cameras, there are other measures that are commonly undertaken to protect taxi drivers. Taxi driving is safer in some cities than others, but in all cities it is a more dangerous trade than many, especially when serving the weekend evening peaks.

Common safety regulations include:

- Trunk with internal release (for drivers locked in the trunk).
- Hidden trouble button to alert dispatcher (and associated system on the dispatch end).
- External trouble light that alerts passing police cars to incident inside.

Requirements vary by jurisdiction, emerging from local experience and needs. They are all to protect the drivers. Do TNC drivers need similar protection? Should taxi drivers have to bear this expense if competing with TNC drivers who are not required? Related is whether TNC drivers should be given the awareness of the relative dangers of the occupation, or basic training in how to deal with difficult customers? The smart-phone trace is a help, but not a fool-proof protection. Cell-phone TNC accounts can also be spoofed and cell phones are sometimes lost and not secured.

[19] Effectiveness of Taxicab Security Equipment in Reducing Driver Homicide Rates. Menendez et al. Am J Prev Med 2013;45(1):1-8

Vehicle Age, Maintenance & Inspection

Vehicles-for-hire are used more intensively than personal vehicles. There is also a tendency to save money by postponing needed maintenance, especially during periodic recessions where driver income has fallen, and there may be more entrants driving out of economic necessity.

Regulations usually require more frequent inspections by licensed mechanics, plus follow-up monitoring and inspection by designated Bylaw or police officers. The inspections are a core task of the regulatory regime.

Should any TNC licensed vehicle also be subject to the same regime? As discussed above, TNC drivers include those driving long hours – similar to other vehicles for hire.

Meters

The taximeter has a long history. For example, the U.S. sets technical standards for meter construction, testing and accuracy. Canada relies on the U.S. standard.

TNCs use GPS tracking and smart-phones to charge by time and distance. Distance measurement by smartphone requires matching the GPS crumb trail to the street map given to the computer doing the analysis. This is potentially accurate, but a non-trivial exercise. Uber, as one TNC, has invested heavily in the accuracy of its systems, but still received a poor grade in from the Better Business Bureau in its California home, due to unresolved consumer complaints. [20] Other TNCs may invest less heavily.

The BC Passenger Transportation Board has already mandated one provider, Ripe, to proceed with a smart-phone based fare based on time and distance. Ripe is required to have independent verification of the accuracy of its systems. However, no standard for accuracy was established at that time.

There are no established standards for accuracy of smartphones apps as taxi meters, although it is under discussion by various regulators and standards authorities including the PTB. In the absence of a U.S. federal standard, Uber has sought alternative regulatory approval through the California Department of Food and Agriculture (CDFA), Division of Measurement Standards. Modern agriculture includes use of GPS guided equipment. As of August 2015, Uber has been granted temporary 12 month approval as a first step towards achieving a full Certificate of Approval from the CDFA.

[20] http://www.businessinsider.com/uber-gets-an-f-from-better-business-bureau-2014-10

Should there be a standard for accuracy? Or a recourse of disallowing a TNC service if its charges proved to be too inaccurate?

Meter Rates & TNC Fares

Fare structure yields a number of issues and choices:

- **Surge pricing?** Uber has pioneered flexible pricing on-demand. This means that during high demand, the price rises until demand falls to the level of availability of vehicles. The advantage of this is a form of efficiency: customers who are willing to pay can always get a vehicle. Disadvantages include surprised customers (despite on-screen warnings), and ethical issues around access. During natural disasters, such as the flooding of New York/New Jersey, the surge pricing of Uber became a significant issue. Uber has since announced caps – but regulators also need to choose what they are willing to permit.
- **Comparable pricing?** TNCs tend to charge for time and distance, whereas a taximeter charges time *or* distance, depending on the speed of the taxi. This makes the fares difficult to compare. The taxis' time *or* distance approach developed in order to provide an incentive for drivers to take the quickest route. Smart-phone technology is not directly linked to the vehicle, so it is not as responsive to variations in vehicle speed. Comparability doesn't necessarily mean using the same basis for charging, but may at minimum call for correct information being delivered to consumers.
- **Flexible Pricing for Taxis?** Under competitive pressure from TNCs, taxi companies in some cities have requested liberty to charge less than the official meter rate. Toronto is an example. Regulators vary in their approach to this. Historically, the most common choice was to forbid discounting. The traditional concern was confusion of customers; cheating of customers by quoting flat rates that were in fact higher than the meter; wanting the meter to be run to ensure an electronic record of the trip; and avoiding a race to the bottom in service quality and vehicle maintenance.

  Flexible pricing is also about responding to low off-peak pricing by TNCs. Uber, for example, has low base rates that often run well below taxi meter rates. It is the flip side of surge-pricing – Uber has pricing flexibility that lets it pursue a strategy of high and low prices at different times of day according to demand. Should taxi companies be permitted to do the same?

10 Choices: Entry Management Alternatives to Fixed Caps

As discussed in the background sections, there are significant policy reasons why cities limit entry to the taxi industry. Cities that de-regulate tend to find themselves re-regulating after a few years, as per the U.S. deregulation experiments in the 1970s. Cities who keep regulations, but drop entry restrictions, experience excessive numbers of vehicles and drivers in the next recession, along with protesting drivers (potentially including TNC drivers) demanding protection for the industry.

At the same time, the limits to the number of taxi plates are significant contributors to the issues around TNCs.

Plate Limits and Ubers Business Model

Uber's business model, for example, is a direct result of plate limits around the world Uber is an innovator, but there is little that Uber does that could not be done by a taxi company. If your company has a better idea – how do you enter the taxi industry at scale? Under plate limited regimes, you need to acquire the plates from an existing operator, a competitor. This can be even more difficult in an owner-driver regime where plate control is dispersed. One can market as a service (e.g. Uber has UberTaxi), but this requires piecemeal sales against opposition by the taxi companies who charge these same drivers for dispatch.

In contrast, if you have a better donut you do not encounter a limit on the total number of donut shops in a city. You do have to meet health and safety and zoning regulations, and find locations – but you can open yourself if you can't find an existing donut operation that you want to use.

Thus it is not surprising that we see Uber and others trying to enter the market a different way, outside of regulation, and with the moral support of the sharing economy.

Another way that plate limits contribute is when they fail to keep up with a city's needs. This is was the case in San Francisco, the birthplace of Uber, Lyft, and other TNCs. It is interesting to note that Uber's original entry was using licensed limousines (now UberBlack "the original Uber") to answer the shortage of taxis in San Francisco outside the downtown core. The service was popular, but survey's showed that what many users actually wanted was the (cheaper) taxi that they couldn't get.[21] Uber's business model was swiftly challenged by the lower cost

[21] *Best Practices Studies in Taxicab Regulation; Taxi User Surveys.* Hara Associates Incorporated (2013). San Franscisco Municipal Transportation Agency.

Lyft, whose shared ride was based on personal vehicles. Uber responded with its UberX service – the service that is at issue with many cities today.

Are there Other Ways of Managing Entry?

Are there ways, other than plate limits, that protect a reasonable profitability within the industry, while allowing competitive entry and innovation?

Under the Passenger Transportation Board, the Vancouver area is under what is commonly termed a *public convenience and necessity* (PC&N) regime. The limits on vehicles are set as a part of the operating conditions of licenses – so that current practice is effectively a plate limited regime. The virtue of PC&N is that it is supposed to be a rule of reason, on a case by case basis. PC&N has fallen out of favour in the world trend to deregulation because of the tendency to advantage incumbents. The Passenger Transportation Board's mandate has been relatively open to new entry (e.g. Ripe Holdings), but remains a regime centred on plate limits through operating licenses.

Separately, municipalities are also empowered to license, and limit, the number of vehicle-for-hire plates.

There are two alternatives to entry management by plate limits that may be of interest to the Vancouver area: Management by Service Standard, and an approach this paper will term Entry Management by Licence Fee. The advantages and disadvantages of each are described below.

Entry Management by Service Standard

Rather than setting a particular number of taxis, the jurisdiction manages the number of vehicles against a performance standard. If service is too slow – more licenses are issued. The advent of computer dispatch systems has made performance measurable. The City of Calgary has moved in this direction through its monthly collection of trip and performance data from taxi companies. The results are used to guide the advice of the advisory committee to Council.

The advantage of this approach is that it is results based, and keeps vehicle numbers tied to actual need. If part-time taxis are licensed, then their impact on peak load performance can be monitored until numbers are sufficient. The success of implementation of accessible taxi service can also be monitored.

Unfortunately, this approach does not full answer the questions of innovation and competitive entry. It is still difficult for a new entrant to enter at scale. Additional

disadvantages, as discussed for Calgary, are the administrative investment in actually processing and monitoring the data. The measurement regime is not also complete, as it is based on the existing scale of service. Taxi dispatch can be fast for areas served, but systemic shortages of taxis may also exist. There may be potential markets where people are choosing to drive, or own a second vehicle, because taxis are difficult to obtain in their area, or at the times that they need.

Entry Management by Licence Fee

Under this approach, the jurisdiction no longer sets a fixed number of plates, but guards against excessive entry to the industry by setting a significant annual licence fee for new plates issued. Older licenses are allowed to continue renewing at the older fee levels.

Advantages of this approach are:

- **It allows the city to choose the level of profitability in the industry that it wishes to protect.** If the desire is protect current plate value levels, then the annual fee would be set to the equivalent to the current plate lease rate (on the order of $10,000 per year depending on the city). A lesser value might also be chosen that is sufficient to keep plates valuable and motivate the provision of the more expensive accessible taxis.
- **It allows competitive entry.** Anyone who thinks they can do better than the present providers can take out licenses directly from the city, rather than having to negotiate purchase of the plates from existing holders.
- **It lets drivers acquire their own license.** When an individual driver wishes to commit to the industry, they too can acquire it from the regulator instead of seeking someone who wishes to sell. Even where drivers prefer to lease or purchase from old plate holders, the bargaining relationship is more balanced, as the driver always has the alternative of obtaining a new plate for the city.
- **Current plate holders are protected.** Through this process, the regulator effectively sets a ceiling on plate leases on older plates, since no driver would pay more than what they could pay the regulator for a new plate. In exchange, the plate holders receive a regime that recognizes and legitimates the level of revenue to plates. In addition to the increased security from the new framework, the explicit regulation makes it easier for financial institutions to recognize the value of the plates when plate holders use them as bonds. In a further benefit, it can be shown that the long run

stabilization of plate lease revenue makes them a less risky asset in the financial sense, increasing the value of the plate to potential purchasers.

- **Plate numbers are driven by passenger demand.** The regulator no longer has to determine a number of plates. When demand increases, industry members will find it profitable to take out additional plates. The number adjusts automatically to market conditions, as in other markets.
- **Lower administrative costs.** The regulator no longer has to undertake extensive PC&N hearings.
- **Potential revenue can be used to improve service or enforcement.** Initially revenues from new plates may be quite low. However, as the jurisdiction grows, more new plates are taken out. The revenue can be used to pay costs of bylaw enforcement, or put back into programs. Programs might include incentives to provide accessible taxi service.

The principal disadvantage of this approach is:

- **No current examples.** Although a well-known solution in other regulatory frameworks[22], the regulation through licence fees is not a current practice in taxi regulation. The strongest endorsement came from an international inquiry conducted by the Australian state of Victoria. That inquiry, led by the former head of their competition bureau, recommended the approach. They also recommended a fee that would effectively have reduced plate value to half its previous level. The Victoria government, after reviewing a second time, endorsed the original recommendation. However, the controversy over the plate value reduction, combined with a change of government, has left this recommendation in process.

As a result, any city that implements this process will be in the positon of an innovator. The City of Vancouver used to auction plates – but this process was not used to determine the number of plates issued.

Applying this approach to TNCs would depend on whether one is considering a separate regime with different driver and vehicle requirements.

[22] In economic terms, the principal is *duality*. Anything a regulator wishes to accomplish in quantity terms can be accomplished by an equivalent measure focused on price. Both can get you to the same point on consumer demand. Application ranges from international trade quotas to regulating money supply. The approach is particularly useful when you are unsure of the quantity required, but have greater clarity on the price.

- **Two regimes.** In this case, a separate licence fee level could be set, so that entry is managed in both taxis and TNCs, protecting both forms of vehicles-for-hire from excess entry and preserving their profitability.
- **One Regime.** In this case, TNCs are viewed as an alternative competitive provider to taxis. They are free to enter the industry and provide service if they meet the same core safety requirements, but must take out the new licenses for their vehicles (this might include different fees for part-time licenses as opposed to full time licenses).

  The net result is that entry is open, but only makes sense if the new entrants can preserve the same level of profitability that the city has chosen to protect for the existing industry. Both new and old operators are protected from excessive market entry during recessions by the significant fee for new licenses.

11 Conclusion

This paper has attempted to provide context and organization to some of the key choices facing the Vancouver area. Multiple ideas have been offered for consideration by discussants. None are intended as a preferred recommendation.

Appendix
Assessment of Vehicle-for-Hire Market Opportunities in the Vancouver Area

This appendix supports a broader discussion paper on the dimensions of choice in future regulation of the vehicle-for-hire industry in the Greater Vancouver Regional District. An important question is whether there are unrealized market opportunities that could be opened in the process of improving and reforming vehicle-for-hire regulation. Compromises among stakeholders (both industry and users) are easier to achieve in the context of an expanding market.

Estimates in this appendix were constrained by the data available at hand to meet the timeframe of the discussion process. Findings should be considered indicative, rather than conclusive. The concluding section expands on what might be needed if the analysis was to be developed further.

How broadly should we think?

Identification of market opportunities depends, in part, on how broadly we are willing to think. What do we take as given in our current approach, and what are we willing to change?

Accordingly, this assessment is made at a number of levels

- **Traditional assessment of taxi market demand.** At the most conservative level, it is possible to conduct a traditional analysis of taxicab demand to see if demand conditions have expanded over time, or whether there are obvious gaps in service for any municipality, or the region as a whole.

  Best practice requires investigating local circumstances using multiple lines of evidence. However, a quick and informative view can be obtained by applying statistical analysis in the form of the taxi demand model maintained by Hara Associates to aid its reviews. That analysis is provided in this paper.

- **Expanding demand from product improvement.** Transportation network companies (TNCs) such as Uber are challenging the vehicle-for-hire industry by providing users with a different experience through smartphone apps. Features include being able to see how near your taxi is on a map, automatic billing, and rating drivers. Taxi companies are responding by providing comparable apps of their own. To what extent can we expect demand for vehicle-for-hire to respond to improvements in the product?

  Here we are a limited by the time frame of this paper, and publicly available data. However, some likely answers can be gleaned from information contained in news releases, and from data collected by Hara Associates in other cities.

- **Shifting the collective civic choice.** The principal competition for vehicles-for-hire is private vehicle ownership. The choice of owning a car, or a second car, is driven partly by the availability of an alternative package of public transit and vehicles-for-hire. However, a chicken-or-egg situation arises when cities wish to shift to a less private vehicle intensive choice: what comes first? Households make choices based on what is available. The vehicle-for-hire industry and public transit may provide service based only the revealed demand they see. With each side making choices based on the status quo, cities may become locked into historical choices that citizens collectively may no longer wish.

A sense of the scale of potential demand can be achieved by looking at the choices made by other cities, as revealed by the relationships that have emerged elsewhere between vehicles-for-hire and vehicle ownership.

- **Public transit and accessible taxis.** Public transit agencies throughout North America are making increasing use of vehicles-for-hire to provide public transit service, notably for serving people with disabilities. The use of vehicles-for-hire offers both potential cost savings and service quality improvements.

  TransLink is considering substantially expanding its use of vehicles-for-hire, if the supply is available. We can get an idea of the potential scale of use by comparing current TransLink usage to the volume of use by cities that have gone further in this direction.

Traditional Assessment of Taxi Market

One traditional indicator of taxi supply is taxis per capita. Figure 1 shows taxis per capita as of 2015, based on information provided the B.C. Passenger Transportation Board (PTB). Municipalities are grouped according to operating authorities. (The figure uses short municipal zone names for legibility. A full listing of the constituent municipalities is provided in Table 1).

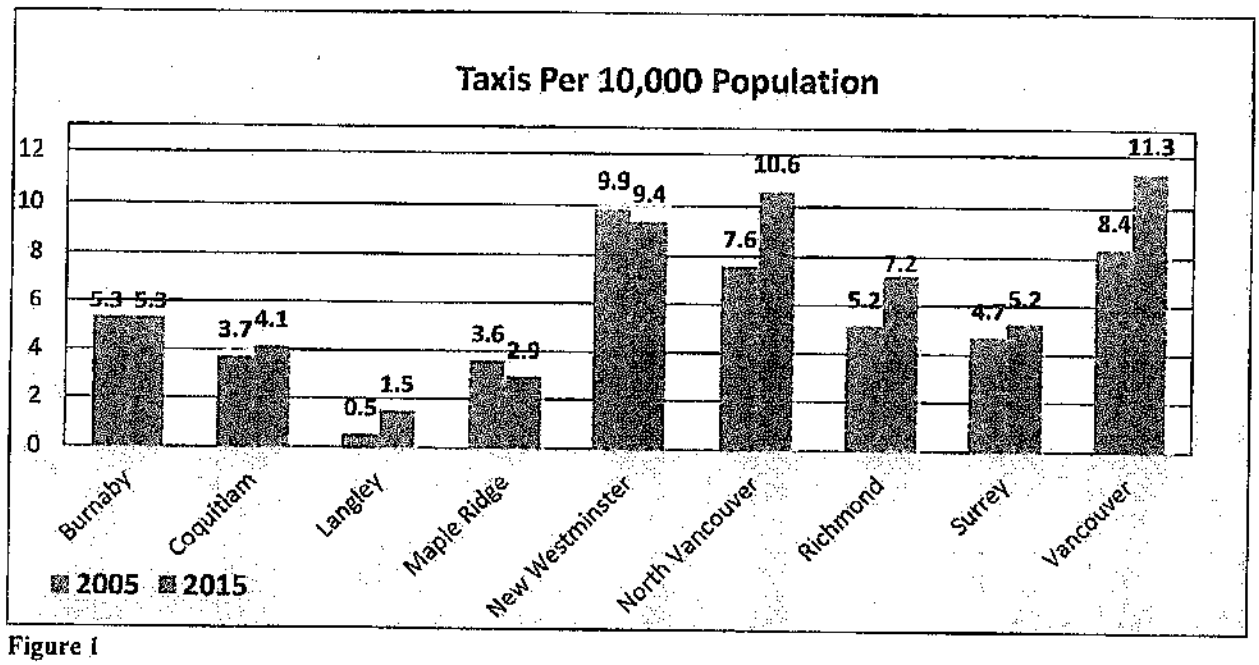


Figure 1

There is a wide variation of per capita taxis within the region, although this is influenced by overlapping PTB operating zones discussed further below. For the region as whole, recent media coverage has suggested that the GVRD's average per capita taxis fall below many other Canadian cities. For example, Calgary had 13.2 taxis per capita in 2010 and has expanded significantly since. Toronto had 18.0 per capita. However, there are also cities with lower per capitas. Mississauga had 7.0 taxis per capita, and Los Angeles only 6.5.

Per capita figures do not tell the full story. To better account for factors other than population that affect differences between cities, Hara Associates uses its Taxi Demand Model. It is a proprietary regression-based model that estimates the demand for taxis as a function of:

- population
- cost to the customer (meter rates)
- proportion of commuters
- employment
- proportion of low income population
- length of winter
- local cost of car ownership

By accounting for these factors rather than population alone, the Demand Model has demonstrated itself to be a statistically valid predictor of the number of taxis required by a municipality. Of particular relevance to the present assessment is the inclusion of commuter day-time population, which serves as an indicator of relative urbanization among the municipalities. The weight given to each factor also takes some correlated issues into account. For example, higher parking costs contribute to commuters' modal choices, and are included in the local cost of car ownership.

It is important to note that the HA Taxi Demand Model is not conclusive in itself. Although it is more accurate than a per-capita comparison, it does not account for factors unique to a city, such as cruise port traffic or peak-load profile. Nor does it account for determinants not in the model, such as the increasing desire of private vehicle owners to use vehicles-for-hire when going out for an evening's entertainment. Hara Associates does not normally use this tool in isolation of other lines of investigation. The final section of this appendix lists the additional lines of evidence that would serve a more complete analysis.

Hara Associates applied the demand model to the municipalities within the Greater Vancouver Regional District. A challenge for the analysis is that the geographic boundaries of taxi company operating authorities (issued by the PTB) sometimes cross municipal boundaries. In addition, many taxi companies are authorized to serve Vancouver International Airport. For the purposes of analysis, the number of taxis taken to currently operate in each municipality was based on the vehicles of companies based in each region (in PTB terms: the primary originating area).

Figure 2 shows results of the model for the City of Vancouver itself. The number of taxis shown is for 2005 and 2015, with an intervening green dotted line showing the average increase over time. The source data available for municipalities were restricted to these start and end years. In 2015, there were a total of 708 taxis in Vancouver itself, of which 99 are part-time taxis licensed to serve peak demand only. It should also be noted that 20 regular taxis are withdrawn when the part-time taxis operate, such that the maximum number of taxis at any time is 688. The solid red line shows the model central estimates for a municipality with similar characteristics. The dashed red lines show the upper and lower bound estimates, at a 95% degree of certainty. The bounds show where 19 out 20 cities with similar characteristics to Vancouver will fall.

Interestingly, the model shows that given Vancouver's demographic factors, per capita taxis were well within the normal range in 2005. Potential demand as measured by the model rose to 567 last year. Actual licensed taxis rose faster, although this may be justified by factors not in the model, such as the well-reported challenge of serving weekend nights. The drop in demand between 2014 and 2015 is likely temporary. It reflects the drop in fuel prices which in turn make private vehicle ownership much more affordable (for as long as the lower fuel prices continue).

The picture for other municipal zones varies. Figure 3 shows Langley (including the district municipality). Looking at the graph suggests that this area is undersupplied, with 21 taxis originating there versus an estimated requirement of around 119. However, this conclusion is strongly moderated by the fact that Langley is also included in the service area of 85 taxis based in neighbouring GVRD municipalities, plus another 33 taxis based in municipalities not included in the GVRD.

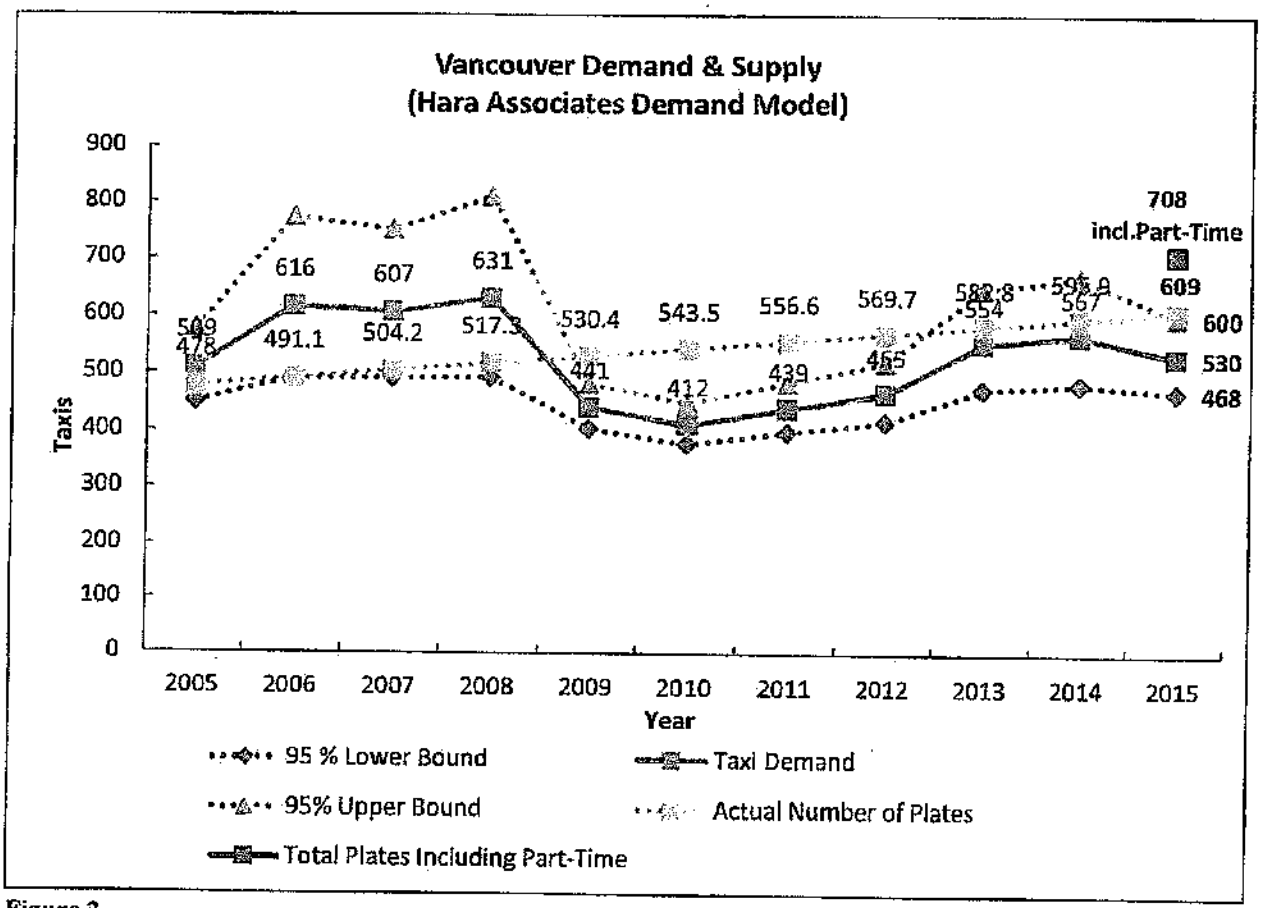


Figure 2

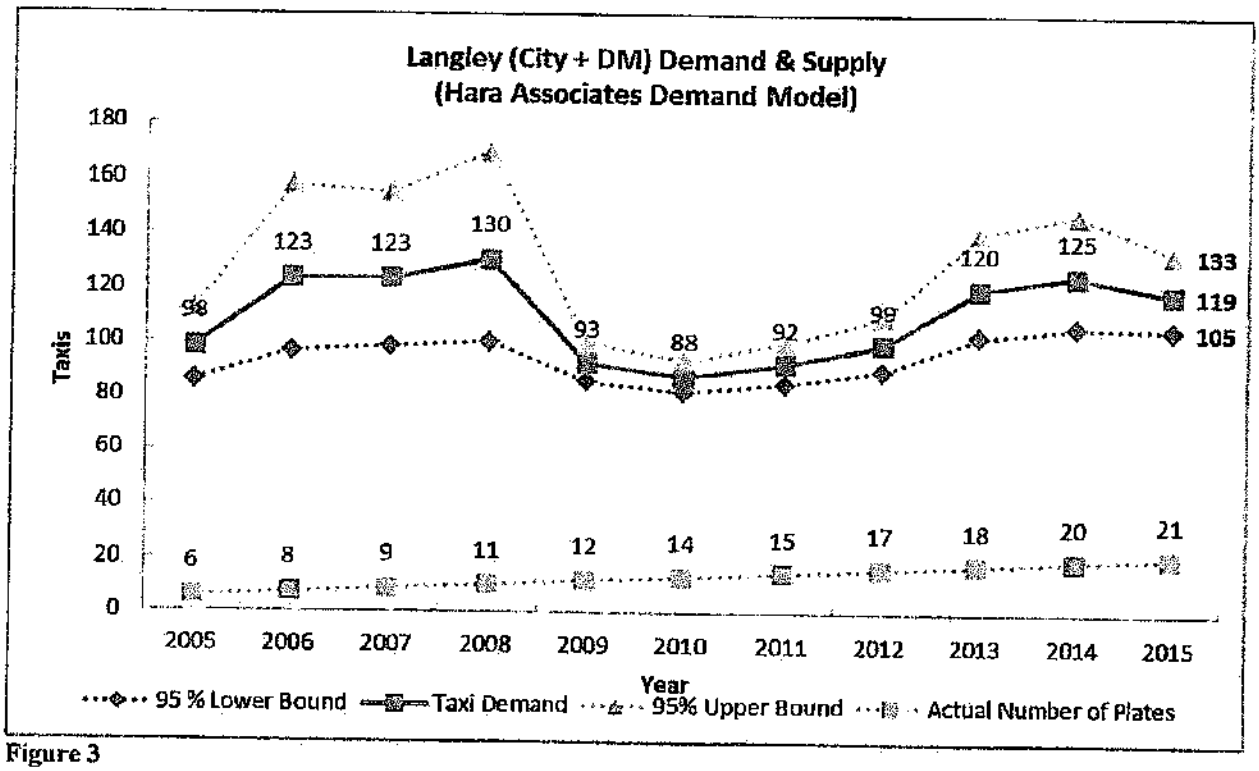


Figure 3

Table 1: Estimated Differences between Potential Taxi Demand and Current Supply

Passenger Transportation Board Primary Originating Area	Currently Licensed Taxis	Central Estimate by Demand Model (2014)	Difference (Supply-Demand Estimate)	Notes on Overlap of Service Areas*
	(A)	(B)	(A-B)	
Burnaby	128	243	-115	The 128 current taxis do not include 68 based in New Westminster who may serve 4 km. into Burnaby.
Coquitlam (incl. Port Coquitlam + Port Moody)	97	162	-65	The 97 current taxis do not include 68 based in New Westminster who may serve part of Coquitlam
Langley (includes district municipality)	21	125	-104	The 21 current taxis do not include 85 taxis based in Surrey/Delta/White Rock who may also serve Langley, or 33 taxis based *outside the GVRD in* Abbotsford/ Mission who may serve Langley.
Maple Ridge (includes Pitt Meadows)	30	58	-28	The 30 taxis include 12 that may also serve *outside the GVRD* in Mission.
New Westminster	68	67	1	The 68 current taxis may also serve 4 km. into Burnaby and 2 km. into Richmond and Surrey. The current taxis do not include 16 based in Surrey/Delta/White Rock who may serve New Westminster
North Vancouver (includes district municipality) & West Vancouver	190	131	59	
Richmond	148	197	-49	The 148 current taxis do not include 16 taxis based in Surrey/Delta/White Rock that may serve Richmond, or the 68 based in New Westminster who may serve 2 km. into Richmond.
Surrey (includes Delta & White Rock)	345	419	-74	The 345 include 69 that also serve Langley and Richmond, and 16 that serve Langley and New Westminster. The current taxis do not include 68 based in New Westminster who may serve 2 km. into Surrey.
Vancouver	708 (includes 99 part-time)	567	141	The 708 current taxis do not include 38 taxis from other GVRD municipalities authorized by the PTB to serve the Downtown Vancouver Entertainment District on weekend nights (but are awaiting judicial review and enabling bylaw amendments by the City of Vancouver).
TOTAL	1735	1969	-234	

** In addition, many companies are licensed to serve Vancouver International Airport.*

A full set of figures for all areas is provided at the end of this paper. Table 1 summarizes the differences between licensed numbers of taxis based in each municipality, and the model's central estimates for that municipality. The estimated demand for taxis uses 2014 instead of 2015 because of the anomalous low fuel prices in 2015.

Because of the cross-border taxi operating authorities, interpretation of individual municipality results requires care. Cross-border considerations (both into and out of) are noted in right hand column of Table 2.

The table speaks more strongly to results for the GVRD as a whole. Most of the cross-border considerations are internal to the region as a whole. The two exceptions are small and offset one another: there are 12 GVRD taxis that may operate outside the GVRD, vs. 33 taxis originating outside GVRD who may come in.

Looking at the region as a whole, there is an indication that collectively the region is undersupplied on the order of 13.5%, (1,735 actual taxis vs central estimates totalling 1,969). There is a pattern where some of the suburban municipalities are significantly undersupplied.

If we disregard Vancouver's estimated oversupply in light of reported peak period shortages, then the estimated shortfall in regional supply increases from 234 to 375 vehicles, or 21.6% of total supply.

Having a taxi shortage does not necessarily mean there are potential passengers wandering the streets punching their cell phones looking for a taxi. People form habits based on current supply, and so will have chosen lifestyles and vehicle ownership that reflect the availability of public transit and alternatives. However, the model estimates suggests that the potential market for vehicle-for-hire in the GVRD is underdeveloped because of long term undersupply.
Results suggest that within the traditional framework of analysis for taxi supply and demand, the Vancouver region has a potential market opportunity for an additional 13.5% to 21.6% of taxis. Most of the opportunity identified exists outside the City of Vancouver itself.

On top of this, we note that the taxi demand model assumes the traditional model of a fixed number of taxis with 7x24 rights to operate. This means there is a degree of undersupply at peak periods that is assumed. The creation of a class of part-time vehicles operating at peak, as is currently being implemented, would be an additional market opportunity. As discussed in the main paper, new technology now permits cost-effective enforcement of part time taxi licenses without a large on-the-street force of inspectors.

Looking More Broadly: The Collective Choices of the City and Region

The taxi demand model operates within fixed average assumptions about civic behaviour. For example, the difference in the cost of private vehicle ownership is partly a result of parking costs, which in turn derive from the relative car-centric nature of the city, combined with urban density.

What if we were to consider broader choices for a city and region? The actual range of city cultures is substantive. Communities are not merely creatures of their geography; they also choose how to react, with greater or lesser emphasis on public transit or vehicles-for-hire. Some of these choices can only be made collectively. As with the suburban taxi question, there is a chicken-or-egg problem. Which comes first, combined public transit and vehicle-for-hire service, or the supply of these modes that which evokes the change in demand and long-term vehicle ownership? If there is no collective action, then present and future choices are determined by accident of history. However, collective choice to move to a new situation is also possible.

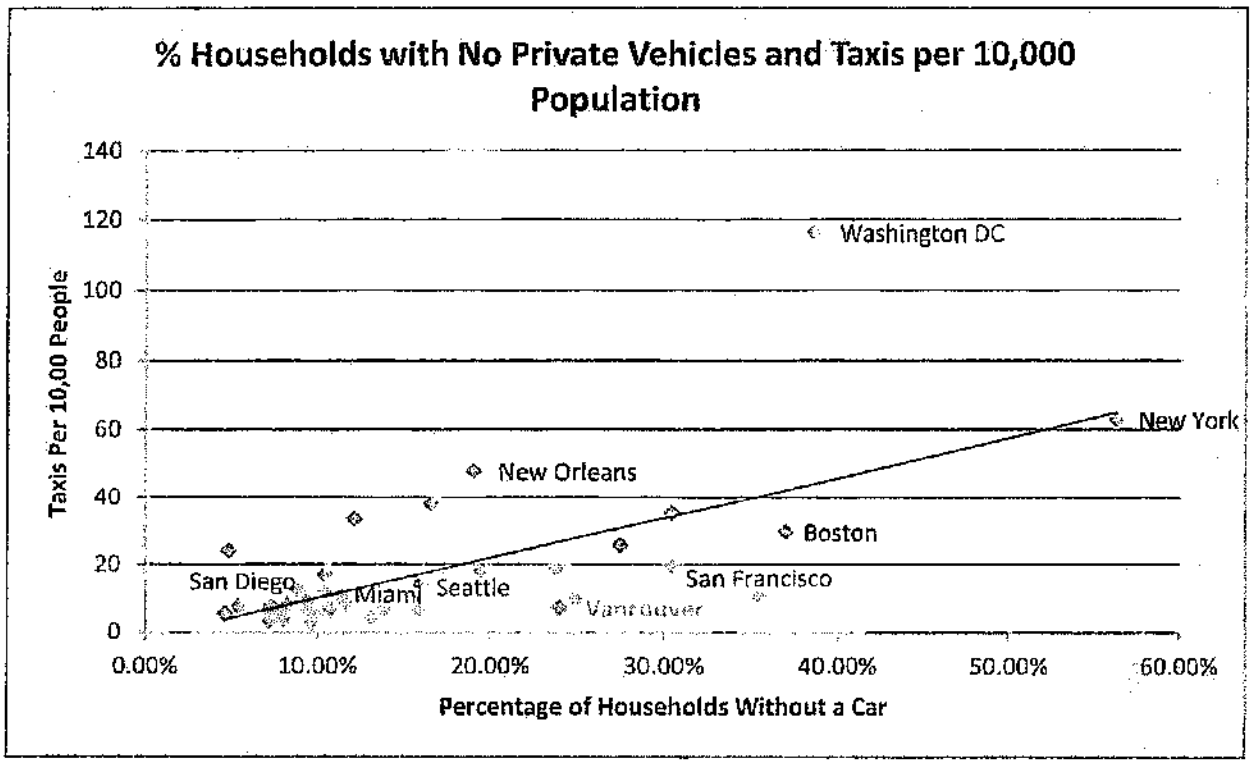


Figure 4

Figure 4 shows the wide variety of choices made by cities in terms of combinations of taxis per capita and the percentage of households without a private vehicle. The combined region of Vancouver's current choice is illustrated by its position in red (7.1 taxis per 10,000 in the region, and an estimated 24% of households not owning a personal vehicle). The Figure is based on available U.S. data, to which Vancouver has been added.[1] The line in Figure 4 shows the average relationship between vehicle ownership and taxis per capita. The more households without cars, the more taxis cities tend to provide.

It is apparent in the figure that Vancouver, as a region, is well below the average line. For a region with relatively high numbers of households without a car, the number of taxis per capita is quite low.

For its level of private vehicle ownership, the average taxi supply is around 25 taxis per 10,000; more than triple the current 7.1 regionally. This suggests that, even at current car ownership levels, there is a substantial opportunity to expand and create business for vehicles-for-hire in the Vancouver area. It is unlikely that tripling the number of taxis could be achieved, since the trend line in the graph is biased by the outliers of Washington DC and New York; however there is plainly room to move up significantly from the bottom of the graph.

How can Vancouver make a different choice? To break the chicken-or-egg problem, it is likely that there would have to be leadership by supply. Both public transit and vehicles-for-hire need to expand in concert, since they are part of the package of services used as an alternative to private vehicles. Individual choices would then respond, first by a shift in commuting and travel choices, and later by incremental decisions, such as families delaying or choosing not to spend money on a second car.

[1] The vehicle ownership for Vancouver Census Metropolitan Area is basis 2008, from Cansim Table 203-0020. Unfortunately, this series has been discontinued by Statistics Canada.

Regional coordination also would be needed, since much of the potential market apparently lies in the suburban municipalities. Such a plan would have to be implemented gradually, and involve public communication, since personal transportation habits do not change quickly. Too fast a change risks starving taxi drivers and empty buses.

Expanding Demand from Product Improvement

Another potential opportunity for expansion, already underway, is to improve the product or service being sold. The TNCs, such as Uber, have demonstrated a qualitative change in how vehicle-for-hire can be delivered. Traditional vehicle-for-hire companies are responding with parallel improvements. Four Vancouver companies have recently launched their own smartphone app, eCab.

For those not familiar with the services, it is important to be aware of the qualitative changes that customers have been enthusiastic about. These include:

- **Knowing your ride is coming.** The apps let you see where the available cars are on a map. After you book, you can see them coming (or see them drop out in some cases—but at least you know what's happening). No more asking the telephone taxi dispatch how long it will be—even though you realize that the telephone operator cannot really give you more than a vague answer. This is crucial in peak load situations.
- **Connecting on the street.** In the traditional system, if you call from a bar to go home, the taxi driver does not know whether you will still be there when they arrive. You may have grabbed a taxi or a friend with a car happened by first. Because of this, the customer is also uncertain that the taxi will show up. This is market failure. The map connection, the credit card guarantee, and the ability to text with the coming car's driver ("I am wearing a red hat"), all go to solving this problem.
- **Ease of payment.** You can pay without getting out your wallet (if you have a credit card)—just get in and get out, tips are calculated automatically. There is no struggle to get a driver to accept the card.
- **Rating and feedback.** Customer (and supplier) ratings have revolutionized commerce over the internet. Customers are happy to have this facility extended to drivers. While some complain the rating system creates the opportunity for racial and ethnic bias, most customers feel that it results in better service.

Having these features will cause an increase in ridership for all vehicles-for-hire. But how much of an increase?

Data to answer this question is present in the separate data systems of TNCs and taxi companies in cities where both operate. Unfortunately there is no public source from which to draw and combine this information. However, we may glean informative information from Toronto.

Toronto was one of the first cities chosen for Uber's expansion outside of the United States. Recent Toronto staff reports estimate UberX now carries an average of 17,000 trips per day.[2] This is based on data released to Toronto city staff by Uber. Uber has spoken of higher numbers in its press releases (as much as 40,000). The Toronto number is older, but the most recent available that has been validated via 3rd party review. The calculation below uses the more conservative 17,000 trips per day.

For a comparative taxi number, Toronto has 4,286 taxis (including all licence types). Most of these are double-shifted. A large number of Ambassador class taxis are in theory single-shifted (one driver) but

[2] *2015 Ground Transportation Review: Taxis Limos and Uber.*

are in the process of being converted to a more general plate. If we conservatively estimate an average of 20 trips per day for all licensed taxis, this suggests a taxi trip volume averaging 85,720.

Combining the estimated volumes for taxis and UberX suggests a mature UberX market share of 16.5% of trips. Many of the Uber trips have been taken from traditional taxis, as witnessed by the reported declining plate values in Toronto. The negative impact on taxis also has been witnessed in other cities, notably New York, where medallion (plate) values are readily observable in the open market.

Without additional data, estimates can only be rough. *If we take a middle position and attribute half of Uber's ridership to a ridership increase, then the joint impact of the change caused by Uber is on the order of 8%.* Note that this impact combines the effect of Uber's service features, and the fact that UberX effectively allows flexible supply at peak periods. We also note that Uber's ride impact is limited by the current uncertainty around its status. The Toronto survey reports that while 45% of citizens want Uber to operate unlicensed, 37% want the service banned. Results varied strongly by age group, with young people being more favorable to Uber.

It should be noted that the *The Economist* news magazine has published an estimate of Uber's impact on traditional taxi trip volumes for the City of New York.[3] In New York, Uber offers its UberX service as a licensed operator of dispatch vehicles-for-hire. A distinguishing feature of New York is that the number of dispatch vehicles-for-hire is not limited. The vehicles that are restricted in number are those who are allowed to pick-up from the street (the *street-hail* market). The famous yellow taxis with the high priced taxi medallions (equivalent to plates) operate in the *hail* market.

The Economist estimated that approximately 65% of UberX trips came from reduced Yellow Taxi trips.[4] The balance, 35%, was assessed to be new trips. Unfortunately, the focus of the Economist article was on taxi medallions, and analysis of impact on dispatch vehicles-for-hire was not included. It is in the dispatch market that Uber directly competes with other New York dispatch companies – so an unknown portion of the remaining 35% of trips may also have come from UberX' s direct competitors in New York dispatch. On the whole, New York is not a good comparator for Vancouver, given that New York's dispatch taxis have not limit on their number.

Public Transit and Accessible Taxis

Public transit agencies must provide service to everyone, including those in wheelchairs or other mobility devices. Historically, this usually has been achieved using a dedicated fleet of multi-passenger buses. Passengers pay low public transit fares, but usually must book substantially in advance to access the limited capacity. Capacity was limited, in part, because of the high cost of the service.

To save costs and increase service, larger municipal transit agencies have been experimenting with using accessible taxis or other vehicles-for-hire. HandyDart, TransLink's specialized service in the Vancouver region, has begun to increase its use of taxis. The point-to-point feature of taxis also provides improved service to clients, although satisfaction with driver training remains a frequent complaint. (For example, t the difference between door-to-door and curb-to-curb service is often disregarded, yet it is an important distinction if your vision is impaired or mobility to the curb is itself difficult.)

In terms of market opportunities for vehicles-for-hire, how much room is there for expanded use of accessible licensed vehicles by HandyDart? Figure 5 compares HandyDart usage to similar services in other cities. While data on the use of specifically licensed taxis (as opposed to private contractors) is not

[3] http://www.economist.com/blogs/graphicdetail/2015/08/taxis-v-uber (full article is requires paid access).
[4] . . . and from the newly issued Boro taxi licenses who also operate in the hail market in areas outside the downtown core.

available, the Canadian Urban Transit Association does collect data on the generic category of trips carried by "non-dedicated fleet."

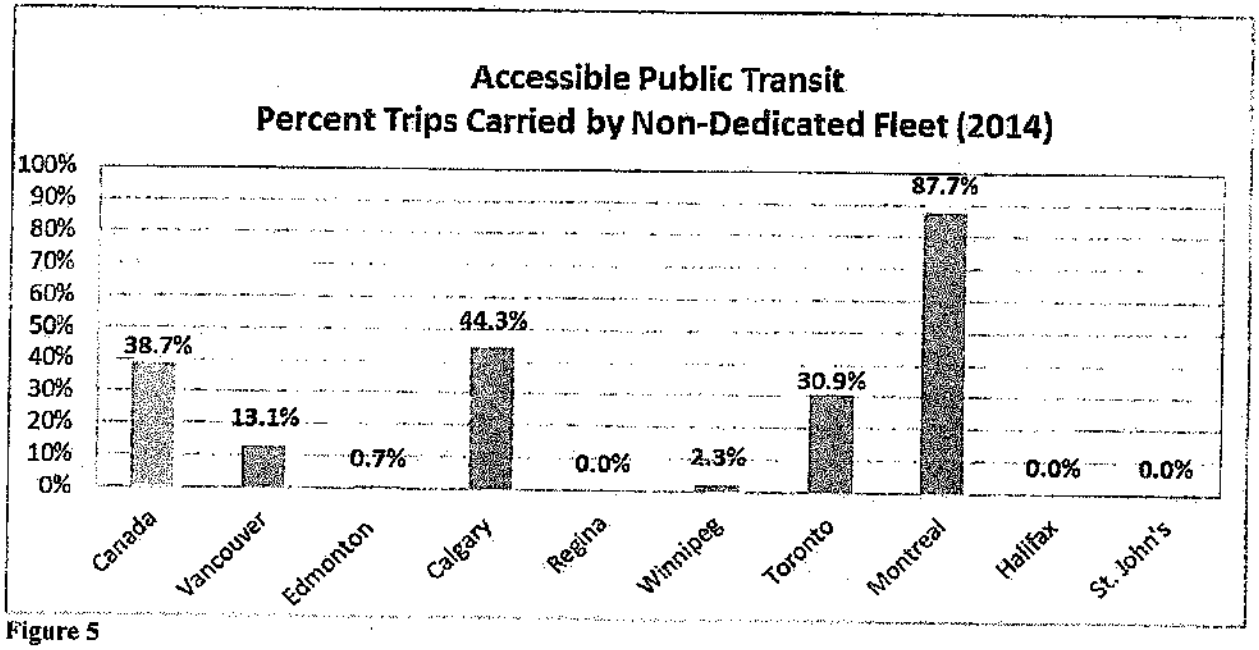


Figure 5

Figure 5 shows that Vancouver has plenty of room to grow, if desired, in its use of vehicles-for-hire to serve specialized public transit needs. Under HandyDart's initial program expansion, 13.1% of trips are handled by non-dedicated fleet. The national average is 38.7%. Looking more closely at Figure 5, we see that it is the bigger services that have been taking initiative in this area (Calgary, Toronto, and Montreal). Calgary, for instance, is up to 44.3%, while Montreal reports 87.7%.

In addition, with the aging population, the demand for HandyDart is expected to continue to grow. The Mayors' Council on Regional Transportation projects an increase of 30% in HandyDart passenger volume.[5]

TransLink is only just beginning to expand the use of vehicles-for-hire. Some cities have gone much further. The potential increasing the number of vehicles-for-hire is at least in the hundreds.

However, both TransLink and HandyDart are limited by the need for vehicle-for-hire providers to first acquire additional licences under the regulatory regime. This again raises the chicken-or-egg question: which comes first? Since TransLink prefers not to conduct its bids competitively, nor to be held to a single supplier, it is difficult to tie expansion in plate numbers to one company in the context of a regulatory application in the current system. Alternative solutions involve either increasing the general proportion of the fleet that is accessible, so that all companies can bid, or tying the issue of some licenses administratively to whichever companies win and hold the contracts.

The regulatory system needs to cooperate if TransLink is to use the vehicle-for-hire system. Sufficient licenses must be available, at least conditionally, to serve any request for bids that TransLink might seek in expanding the use of public vehicles-for-hire.

It is important to note that TransLink does not *have* to use licensed vehicles-for-hire. In 2014, out of the 182,721 trips handled by non-dedicated fleet, only 86,000 were handled by taxi. The alternative is to

[5] *Regional Transportation Investments: a Vision for Metro Vancouver (2015)*

contract to a private fleet company and run them as transit vehicles exempt from regulatory constraint. However there are significant advantages to both TransLink and users in using vehicles and drivers licensed, trained, and inspected by the established regulatory system. For TransLink, the regulatory system already does what TransLink would otherwise have to do in terms of due diligence supervision. From the perspective of users, expanding the fleet of accessible vehicles-for-hire both:

- increases the public transit fleet while also increasing their vehicles' availability as dispatch vehicles during other service hours, and
- increases the likelihood that eligible public transit accessible vehicle users can have on-demand service through taxi dispatch systems, rather than a scheduled book-ahead service. On-demand is what users want, but it only becomes feasible when the fleet expands to critical level.

Because TransLink is regional, and has a choice of whether or not to go the public vehicle-for-hire route, it also has the opportunity to lead in any regulatory reform, or in broader moves to change the collective transportation choices of the Vancouver area.

Steps to Improve the Analysis

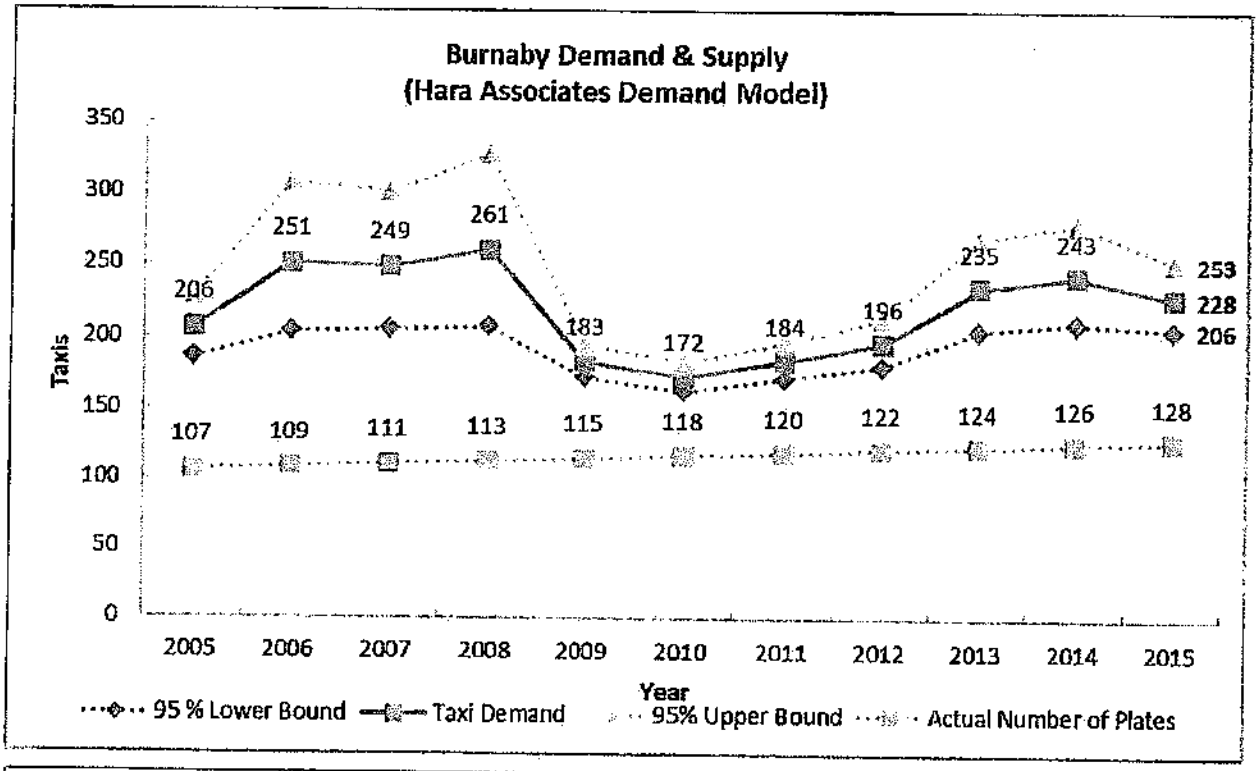
As noted in the introduction, the estimates in this appendix are only an initial assessment, constrained by available data. Findings should be considered indicative, rather than conclusive.

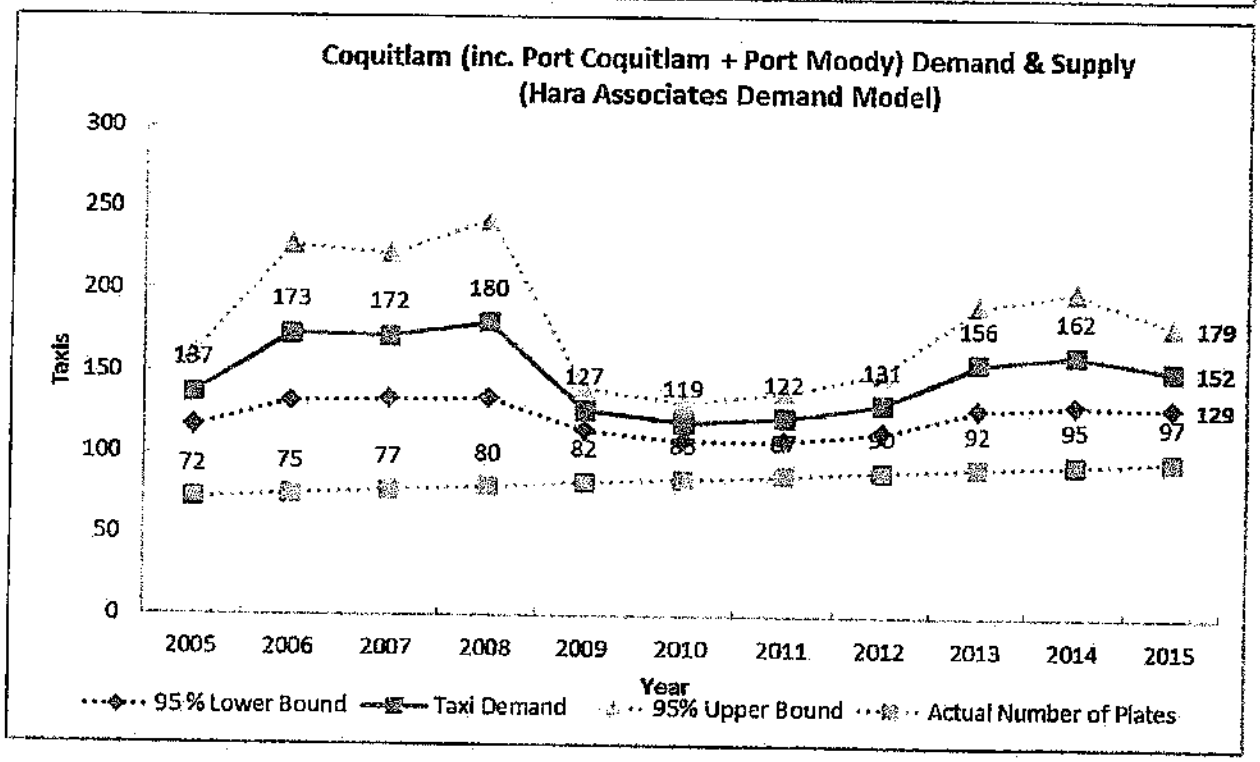
Developing more accurate estimates would involve developing additional lines of evidence and better accounting of the unique aspects of Vancouver. This would likely include,

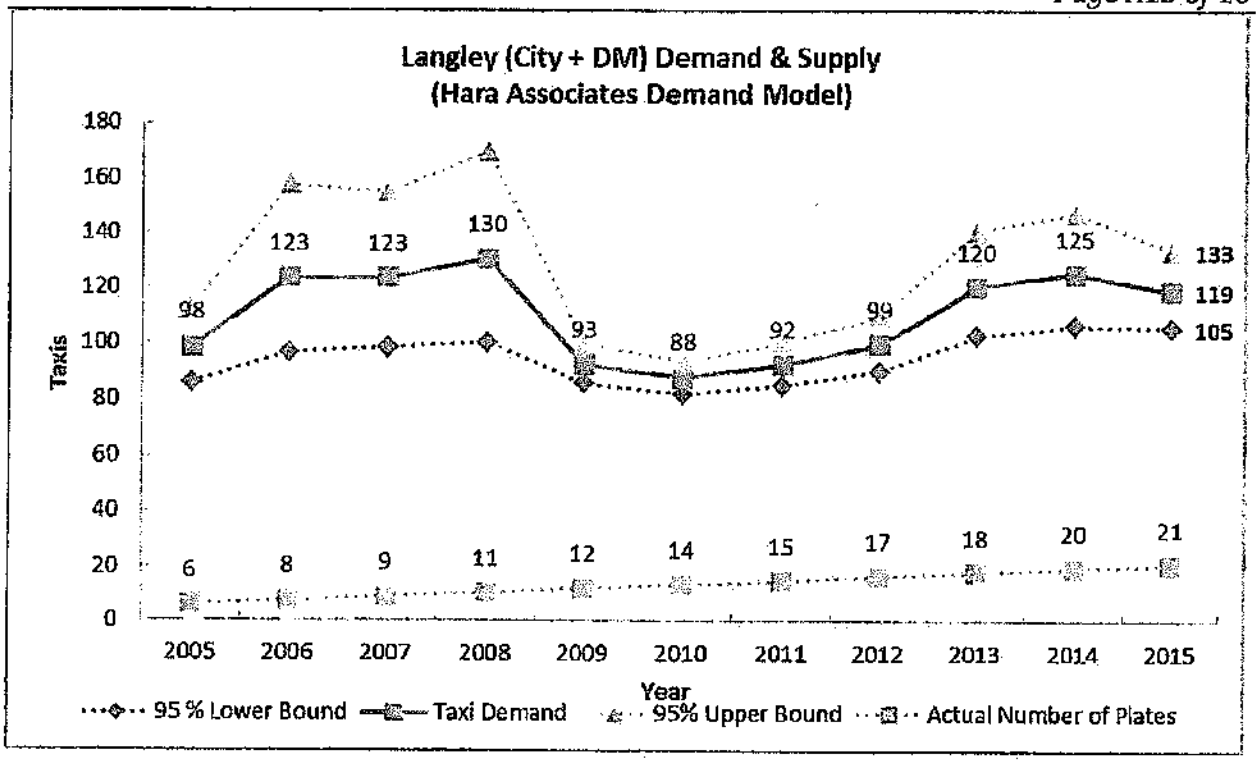
- Investigative time on the streets especially at peak periods and areas (bar closing, docks, airport).
- Hearing from individual stakeholders to gather experience. Insight and evidence.
- Analysis of broker dispatch data.
- Conducting on-street timing analyses.
- Analysis of industry structure and the unique aspects of Vancouver's market – such as growth in airport passenger volumes, or the cruise ship dock operations. A particular issue in Vancouver is peak load demand – it appears to be qualitatively different than the rest of the day. Since new technology offers new options for licensing – an investigation would look more closely at the evolving role of part-time licenses and other solutions.
- Hearing individual drivers and taking vehicles for hire to experience system performance directly.

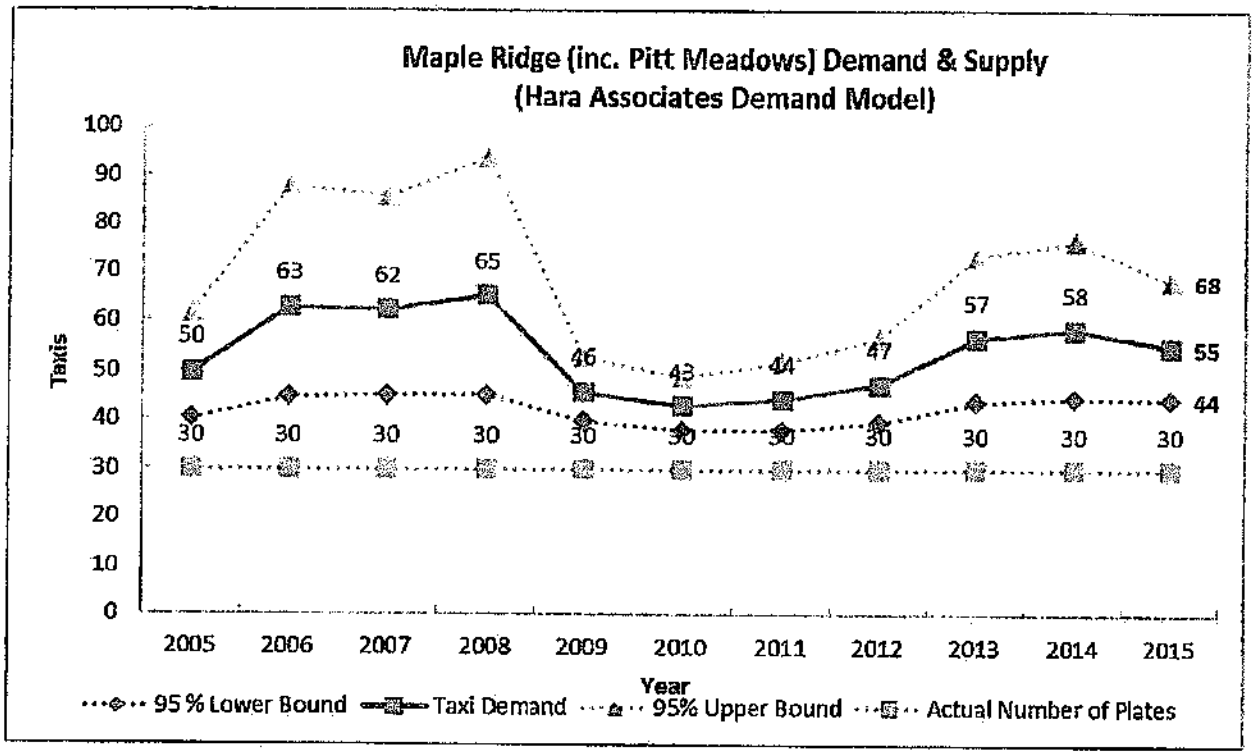
Supplementary Figures Begin on Following Page

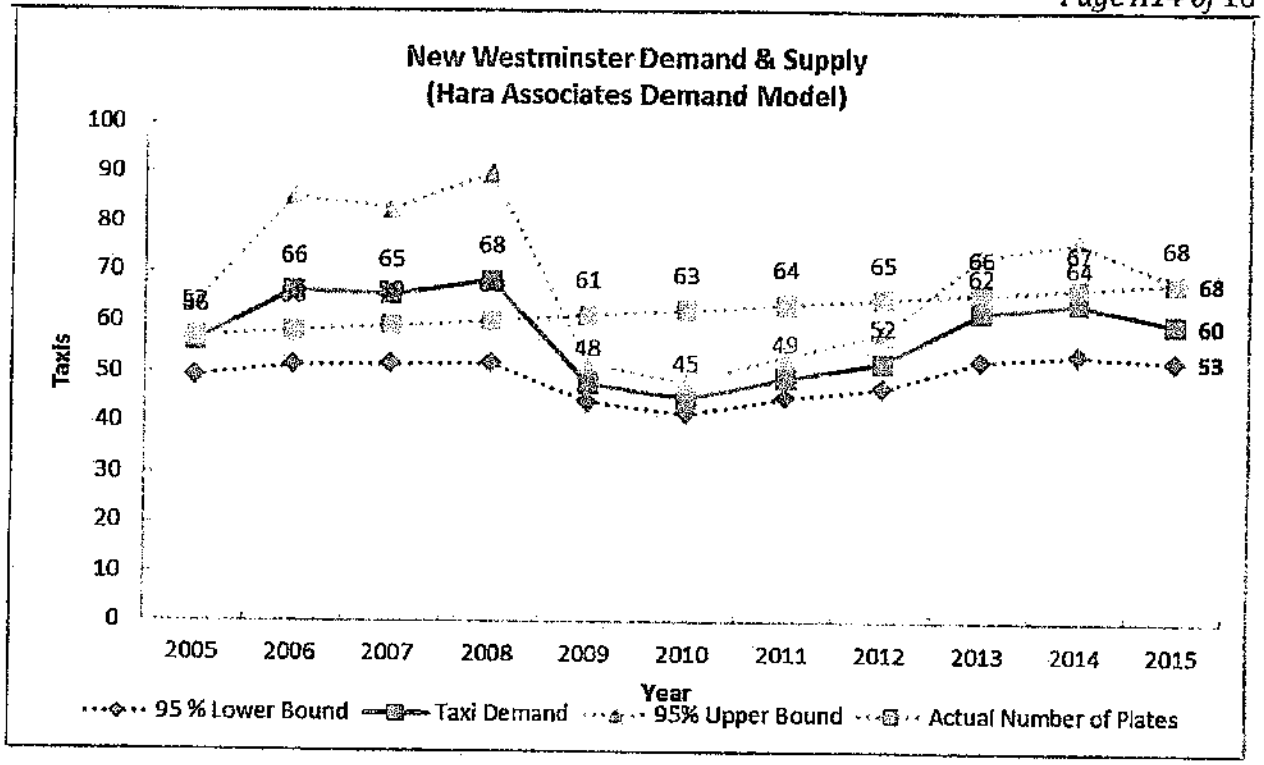
Annex: Complete Figures for All Municipal Zones Established by the Passenger Transportation Board

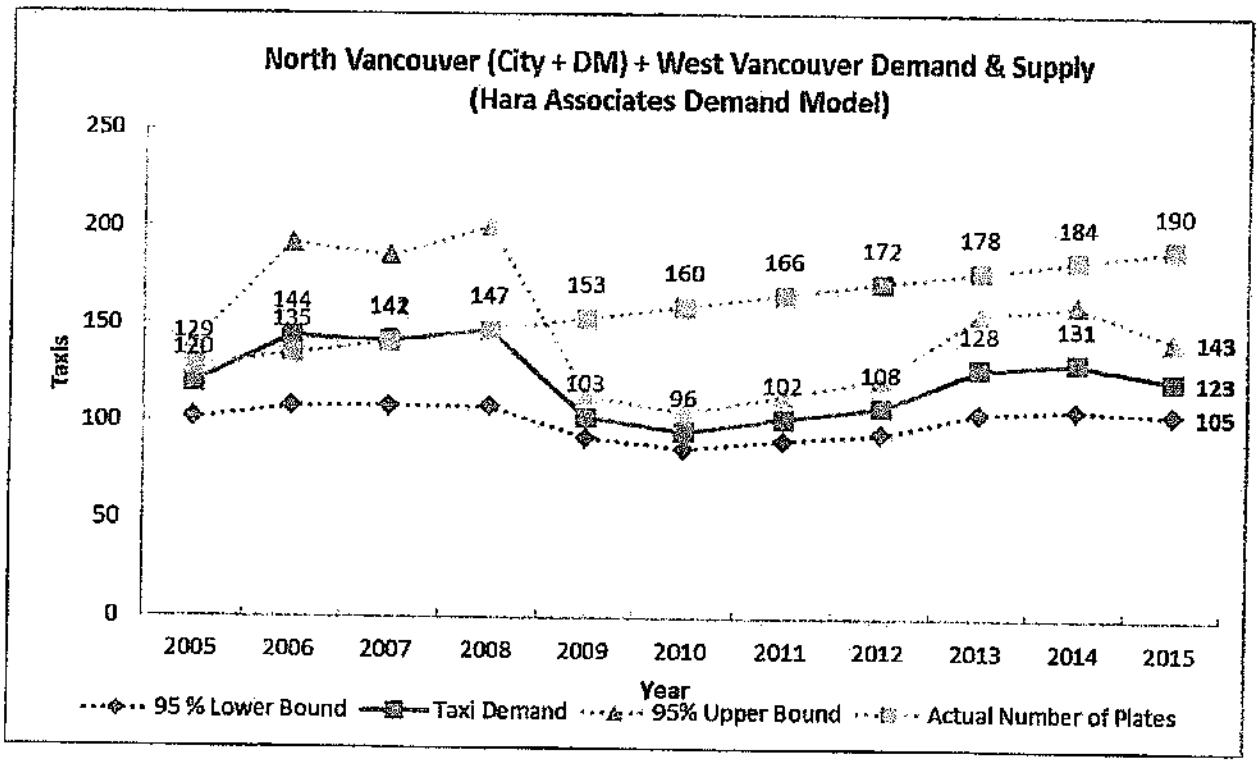


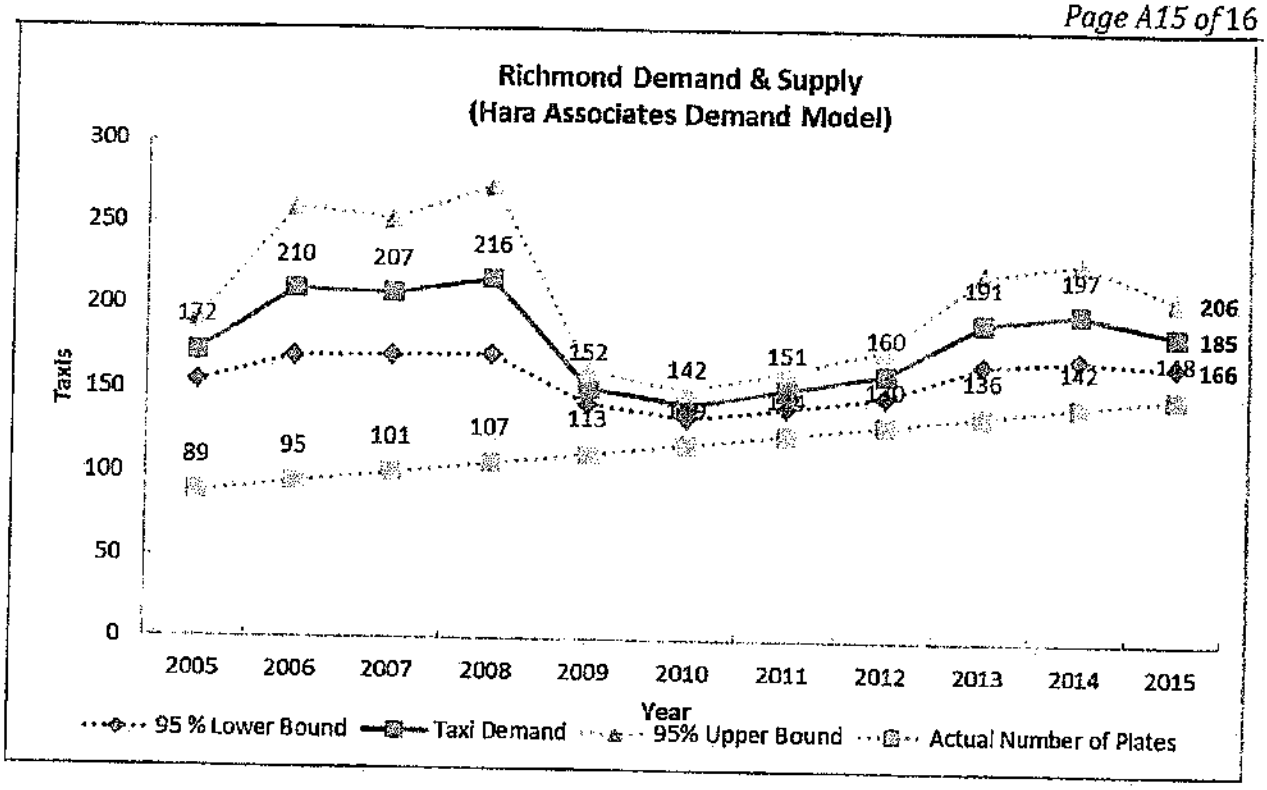


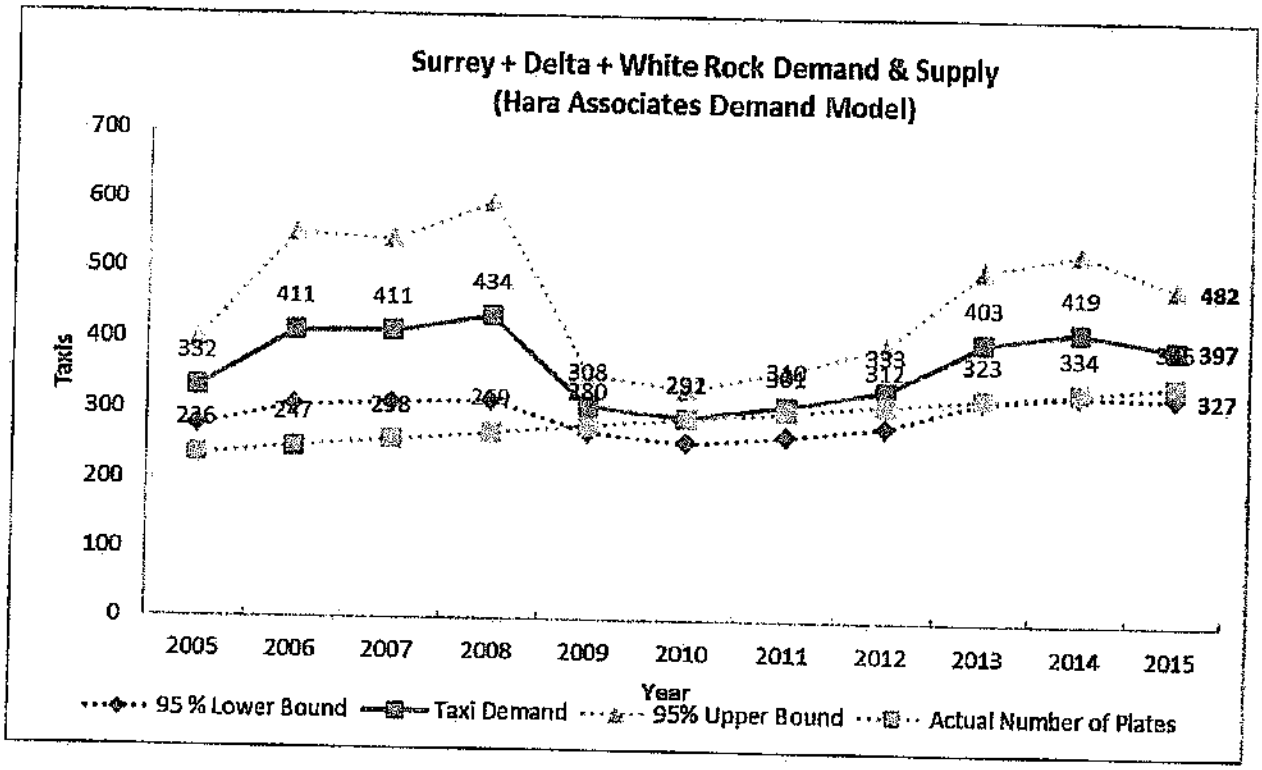

Langley (City + DM) Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates

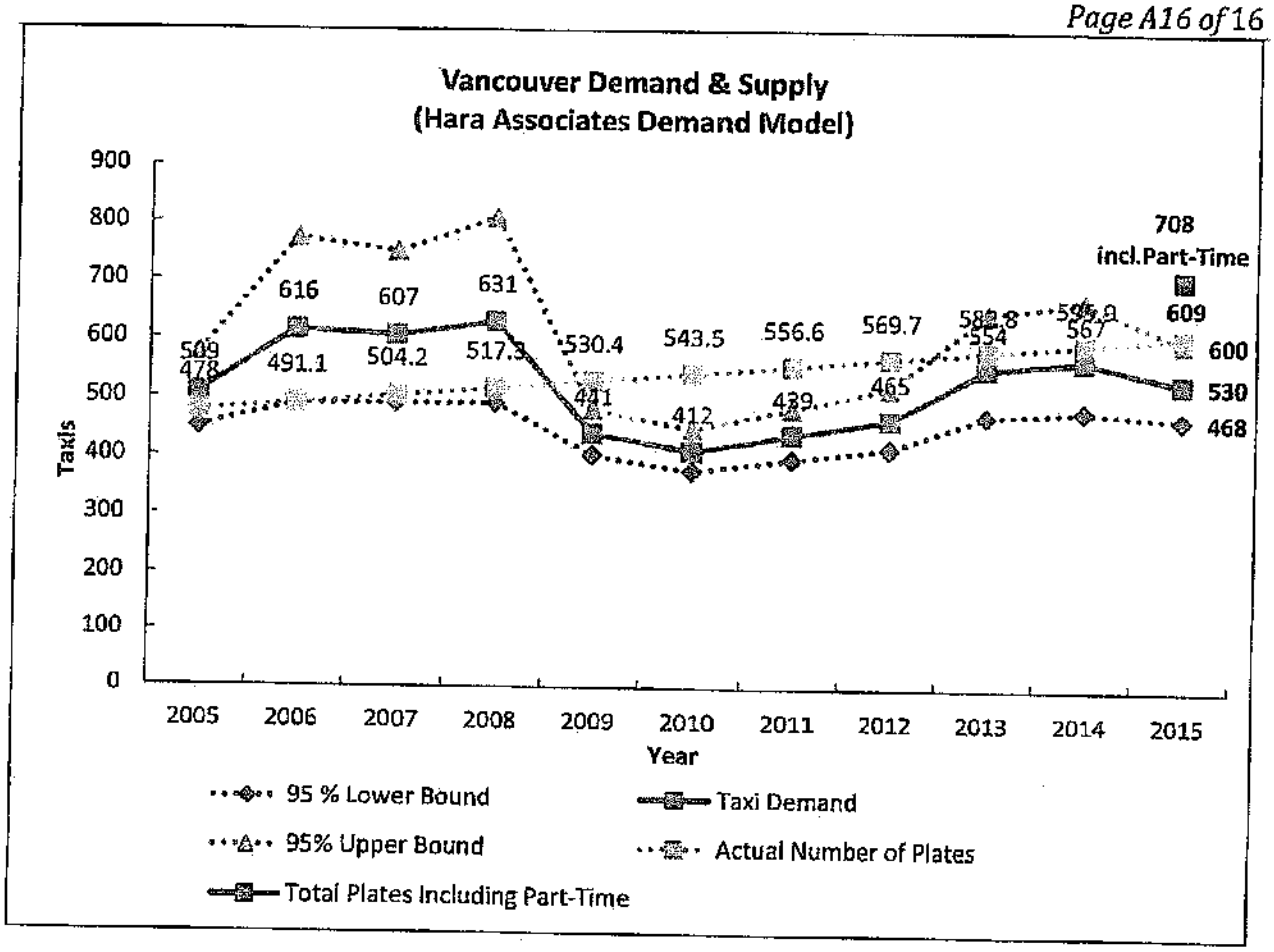

Maple Ridge (inc. Pitt Meadows) Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates


New Westminster Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates


North Vancouver (City + DM) + West Vancouver Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates


Richmond Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates


Surrey + Delta + White Rock Demand & Supply
(Hara Associates Demand Model)
Taxis
Year
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates


Vancouver Demand & Supply
(Hara Associates Demand Model)
900
800
700
600
500
400
300
200
100
0
Taxis
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Year
616
607
631
530.4
543.5
556.6
569.7
491.1
504.2
517.3
441
412
439
465
554
567
708
incl.Part-Time
609
600
530
468
95 % Lower Bound
Taxi Demand
95% Upper Bound
Actual Number of Plates
Total Plates Including Part-Time

CLIFF XXXXX
(X-REF. #XXXXX)

BRITISH COLUMBIA | Ministry of Transportation and Infrastructure

BRIEFING NOTE FOR INFORMATION

DATE: DRAFT September 6, 2017

PREPARED FOR: Honourable Claire Trevena, Minister of Transportation and Infrastructure

ISSUE: Taxi Industry Consultation Framework

SUMMARY:

- **The taxi industry is the primary provider of passenger directed transportation services in British Columbia.**
- **The current regulatory regime and legal requirements to operate in B.C. have been in place since 2004.**
- **Changes in technology and meeting consumer expectations for safe, reliable and affordable passenger transportation service require government to assess the existing PT framework** s.13
- **A comprehensive consultation with the taxi industry is required to identify opportunities to modernize the existing regulatory framework** s.13

BACKGROUND:

The taxi business is an established industry providing point-to-point transportation services in B.C. and is currently the primary provider of passenger directed vehicle (PDV) services in B.C. Concurrent municipal and provincial jurisdiction over taxi operations has created a complex regulatory environment for B.C.'s taxi industry with sometimes overlapping or duplicative requirements.

s.13

A comprehensive consultation with the taxi industry, local government and interest groups will allow government the opportunity to gather the necessary information to allow government to consider changes to modernize the existing industry in a way that allows it to remain viable and compete on equal footing should rideshare services be introduced in B.C.

DISCUSSION:

The Minister of Transportation and Infrastructure's mandate letter directs her to work with the Minister of Public Safety and Solicitor General to create a fair approach to ridesharing and government committed to "work with taxi drivers, taxi companies and ridesharing companies to create a truly fair approach to ridesharing in British Columbia that doesn't unfairly benefit – or punish – one group over the other."

The consultation could be undertaken by a trusted industry expert, Dr. Dan Hara of Hara Associates (see Biography Appendix A). Dr. Hara is conversant with the current passenger transportation regulatory framework in B.C. and has worked with stakeholders in the 2015 *Vehicle for Hire Dialogues* facilitated by the City of Vancouver (see Discussion Paper Appendix B).

Hara Associates also has previous experience with addressing the impacts of ridesharing to the taxi industry in a number of other Canadian jurisdictions. For example, Hara Associates played a key role in the City of Ottawa's 2015 taxi industry review. The review was aligned to the City's guiding principles

BRITISH COLUMBIA Ministry of Transportation and Infrastructure

of safety, accessibility and consumer protection and was conducted in three phases which included research, publishing of discussion papers, consultation and workshops to develop policy option papers, analysis and publishing of a final report to assist Ottawa's decision making process.

In order to engage with B.C.'s industry and consumers, Government would create a list of groups that could be part of the consultation (see Taxi Stakeholder List Appendix C). Each of these groups could provide government with an understanding of the importance that transportation options affords both industry and the public as well as they key themes that are relevant to them with the taxi industry.

Taxi companies in B.C. are represented by two associations, the BC Taxi Association (BCTA) and the Vancouver Taxi Association (VTA). In addition, the Taxi Drivers' Association of Southern B.C. (Taxi Drivers' Association) represents taxi drivers who are not share or licence holders. s.13,s.16
s.13,s.16

s.13,s.16

The terms of reference for the engagement and consultation led by Dr. Hara would include a number of the concerns that the industry and other stakeholders have raised previously including maintaining high safety, insurance and training standards, eliminating overlapping regulatory oversight, ensuring adequate accessible service levels and protecting the investment of licence or shareholders. s.13
s.13

s.13
s.13

Key milestones could include:

1. Agree to terms of reference for consultation and reporting
2. s.13 stakeholder outreach to share government's view/direction:
   - Passenger Transportation Board
   - Taxi Associations
   - Union of BC Municipalities
   - Treaty First Nations
   - Insurance Corporation of BC (AG)
   - RoadSafetyBC (PSSG)
3. Summary report and recommendations provided to Cabinet

FINANCIAL IMPLICATIONS:

s.13 A contract may be directly awarded if the contractor is the only one qualified to provide the services. Estimated to be approximately s.13

Attachments: APPENDIX A: Bio: Dr. Dan Hara
APPENDIX B: City of Vancouver Discussion Paper
APPENDIX C: Taxi Stakeholder List

PREPARED BY:	REVIEWED BY:	INITIALS
Kristin Vanderkuip, Registrar & Executive Director Passenger Transportation Branch (604) 992-9140	Deborah Bowman, Assistant Deputy Minister Transportation Policy and Programs	
	Nancy Bain, EFO Finance and Management Services Department	

BRITISH COLUMBIA Ministry of Transportation and Infrastructure

APPENDIX A
BIO: DR. DAN HARA, HARA ASSOCIATES

Dr. Dan Hara has 21 years of experience advising government agencies on regulatory and transportation policy. A specialist in industrial organization, his work has covered many regulatory environments, including taxi regulation.

Hara Associates is a firm of economists that has been working with policy makers and regulators in the United States and Canada since 1987. They provide advice on policy, evaluate programs, and assess economic impacts. Services include public consultation, presentation to elected officials and senior management, benefit/cost, value-for-money audits, and managing change.

Past clients of Hara Associates' Taxi Regulation Program include Los Angeles, Edmonton, Washington, D.C., Halifax, Sudbury, Calgary, Kitchener-Waterloo, and Ottawa-Carleton.

Hara Associates • (613) 722-5528 • hara@haraassociates.com • 1086 Somerset Street W., Suite 406 Ottawa, Ontario Canada K1Y 4T3

APPENDIX B
CITY OF VANCOUVER DISCUSSION PAPER

APPENDIX B
VEHICLE FOR HIRE CONSULTATION

Mandated and Potentially Legally Required Consultation Groups:

- Union of BC Municipalities
- Treaty First Nations
- Passenger Transportation Branch
- Passenger Transportation Board
- Minister of Public Safety and Solicitor General – RoadSafetyBC

Other Interested and Potentially Impacted Consultation Groups:

- Insurance Corporation of British Columbia
- Road Safety BC
- Vancouver Taxi Association
- BC Taxi Association
- Taxi Drivers' Association of Southern BC
- BC Limousine Association
- Uber/Lyft/GoKabu/Ripe Rides/RacoonGo/Spare
- Port Metro Vancouver
- CERES Cruise Terminals
- YVR & other airport operators
- Disability/Accessibility & Seniors Associations
- TransLink
- BC Transit
- Justice Institute – Taxi Host Program
- Association of Beverage Licenced Establishments
- BC Hotel Association
- BC Chamber of Commerce
- BC Association of Chiefs of Police