

Discussion Paper
Approaches to Changes in Operating Areas for
Taxis and Transportation Network Services in Metro Vancouver
March 4, 2019

Each licence issued by the Passenger Transportation Board (PT Board) sets out the operating area in which the licensee is permitted to operate.

This paper discusses the operating areas currently established for taxis and those to be set for new Transportation Network Services (TNSs). TNS is the legislative term for what is known colloquially as a *rideshare* service, such as Uber or Lyft, and such Canadian counterparts as TappCar or InstaRyde. In 2019, the PT Board will receive licence applications from TNS firms. A decision on operating areas will be required as part of TNS licensing. The focus of discussion is the Metro Vancouver Regional District.

The principal options for Board policy and reform are identified. Each option is analyzed in terms of two of the Board's statutory criteria for licensing decisions: public need and promoting sound economic conditions in BC's passenger directed vehicle transportation industry.

The paper provides background on:

- The history of metro taxi boundaries and current issues
- The relationship between the Board's statutory mandate and the private market value of taxi *licence-shares*
- Industry structure and stakeholder groups for both taxis and TNSs
- The relevance of operating areas to taxi licence-share values and driver income
- The environment likely to emerge following the licensing of TNSs.

Options are analysed for:

- Rules for trips crossing operating area boundaries
- Taxi operating areas
- TNS operating areas.

1 History of Metro Taxi Boundaries and Current Issues

Metro Vancouver Regional District is a large area in the lower mainland of British Columbia. It comprises some twenty cities, district municipalities, electoral areas, and the Tswawassen treaty first nation. Metro's core is heavily urbanized across multiple municipalities, while other parts of the district include villages and rural areas.

Each taxi company is licensed by the PT Board for a given number of vehicles in a designated operating area. In previous decades, taxi operating areas corresponded closely to municipal boundaries. As urban development spread across the region, it began to extend beyond municipal boundaries, starting with what is termed "ribbon development" along principal highways (and across bridges). To better serve the public, the operating areas of taxi companies were extended to allow them to serve the newly built-up areas that had grown beyond the boundaries of their respective municipalities. A 1989 review by the Board's predecessor, the Motor Carrier Commission, explained the development of provincial regulation of taxis this way:

“Following the Second World War, taxicab services tended to be very localized, even within cities and municipalities . . . Taxicabs could not remain exclusively in one municipality because of the ribbon development in the lower mainland.”¹

The present boundaries of each taxi company vary. They roughly correspond to municipal boundaries but include chunks of other municipalities reflecting post-war development patterns and use.

Since boundaries were last set, Metro Vancouver’s urbanization has continued, resulting in a high degree of economic integration between its municipalities. Passengers now frequently wish to take trips that cross the old boundaries. Taxi boundaries that once made sense because they encompassed a single developed area, may now appear to be arbitrary lines drawn across the middle of a continuous urban landscape.

Impact of Historical Taxi Borders on Consumers and Industry

Current issues resulting from historical taxi operating area boundaries include:

- **Deadheading.** Taxis may pick up a passenger in their “home” operating area and transport them anywhere in Metro. However, unless prearranged with that particular passenger, they are not permitted to take a paying passenger from other areas back to their home area. This means they return empty, a cost to them and an inefficiency that is a net loss to society.
- **Trip Refusals.** Under the regulations, taxi drivers cannot refuse a trip except under limited circumstances. In practice, some taxi drivers refuse a request by a passenger to go from a suburb to downtown, or vice versa. Although a long trip may seem attractive, it is not because of the likelihood of returning empty. In addition, trips occurring close to when the driver’s shift is coming to an end may also be refused because the trip cannot be completed before the driver is due to pass the vehicle on to another driver. The latter issue has been partly addressed by recent PT Board policies on shift-change and allowing separate day and night shift cars – however the problem of trip refusals continues.
- **Shortages at Peak Demand Periods.** There are times, such as weekend nights, when there may be a shortage of taxis licensed to operate in one area (e.g., downtown Vancouver), while there is a surplus of available taxis in another operating area whose drivers would gladly respond but are not permitted. In answer to this, the PT Board has previously authorized some 38 suburban taxis to operate in downtown Vancouver on weekend nights.² However, a more general rule reform may be more effective than making case-by-case decisions.
- **Level playing field and Taxi Apps.** To compete with TNSs, taxi companies are labouring to produce their own successful smart-phone apps. They would like these apps to be able to dispatch taxis for return trips to home areas, reducing deadheading. As a further step, they are considering cooperation between apps, or possibly a shared common app (e.g. Vancouver Taxi Association’s Kater app). Using apps effectively to eliminate taxi dead-heading may require changes in rules about return trips to home operating areas.

These changes are particularly important in the case where TNSs are given bigger operating areas that better correspond to the current urban form of Metro. If this is done for TNSs the present rules will give TNSs an advantage over taxis because the larger operating areas provide greater flexibility to TNS vehicles without the constraints of cross-border rules.

¹ *Taxicab Review – Vancouver Region.* Motor Carrier Commission of British Columbia, May 1989. Page 5.

² This measure was not implemented due to a conflict in jurisdiction with the City of Vancouver. However, recent legislation has clarified the PT Board responsibility and authority over operating areas, bringing the measure into force once the legislation comes into force.

The above issues are significant inconvenience to the public and to operators. Trip refusals have received significant media coverage, as have shortages of taxis at peaks. The financial costs and waste associated with deadheading are also significant. Changes to operating areas and rules for crossing boundaries may offer opportunities for net improvements.

Comparing Metro Vancouver to Other Jurisdictions

To provide perspective, Metro Vancouver can be compared to two other large urban Canadian jurisdictions. Calgary and Toronto were selected to show relatively more integrated taxi operations areas.

Figure 1 shows Metro Vancouver. Taxi operating areas correspond roughly to municipal boundaries.

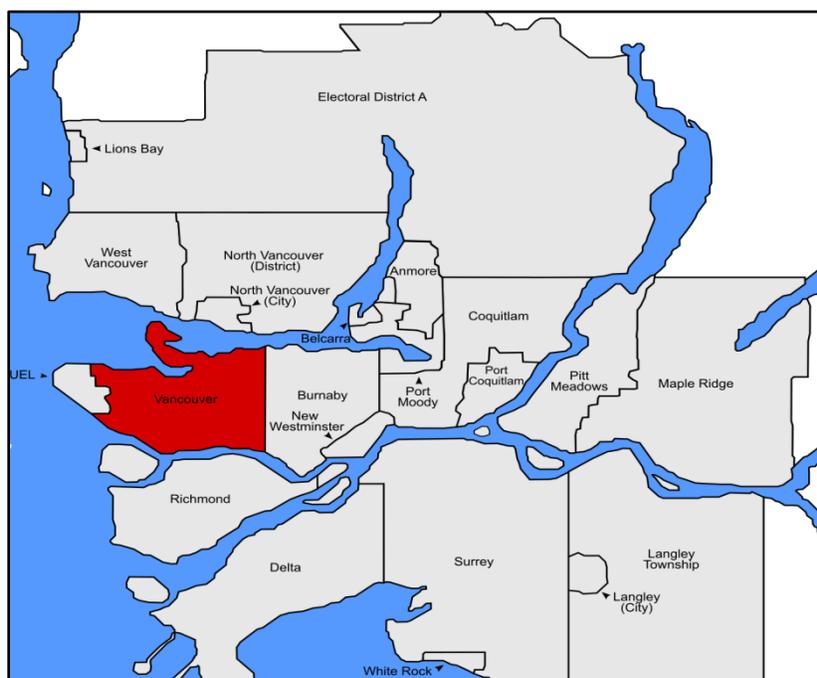


Figure 1: Metro Vancouver

Figure 2 overlays the City of Calgary onto a map of Vancouver. Taxis are municipally regulated in Calgary. Both taxis and TNSs are allowed to range over the entire city. This does not stop taxis from specializing in certain areas of the city. However, they move freely and so are not required to deadhead back to their home area. Calgary covers an area equivalent to the City of Vancouver and its surrounding municipalities, plus Delta. Although large, Calgary's urban development has reached the point where it is beginning to experience issues with cross taxi movement with other municipalities.

Figure 3 overlays Toronto onto a map of Vancouver. Toronto taxis and TNSs are also municipally regulated as a single operating area. Although not as large as Calgary, Toronto still encompasses an area much larger than the City of Vancouver. Although Vancouver's water and bridges may appear to offer a difference in natural barriers, both Toronto (and Calgary) are divided by rivers and man-made features that offer similar choke points and barriers. In Toronto's case, these include the Don Valley, and the 12-lane highway 401.

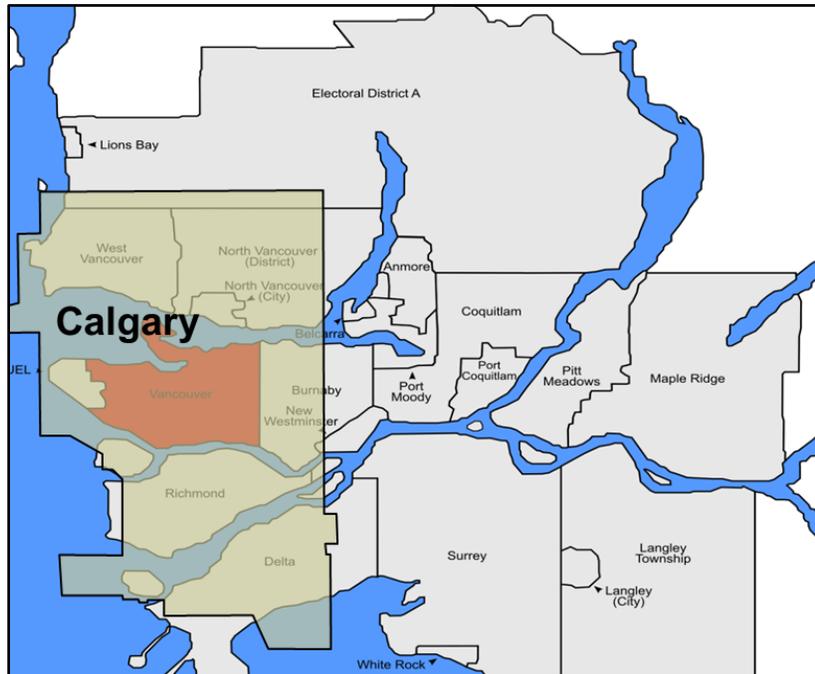


Figure 2: Scale Overlay of Calgary



Figure 3: Scale Overlay of Toronto

Why have Operating Areas at All?

There is a school of thought that questions whether restricting companies to given operating areas is necessary. Proponents of this school argue that if a company meets safety, financial, and other “fit and proper requirements”, it should be permitted to operate anywhere in the jurisdiction where it finds customers.

BC's practice of licensing to specific operating areas is common, but not universal. Where jurisdictions are municipal, taxis are commonly allowed to run throughout the municipality. Exceptions are:

- **Municipalities that are a product of regionalization.** Where a provincial government has combined several municipalities into one, taxi licences sometimes continue to adhere to operating zones corresponding to the old municipal boundaries. Halifax Regional Municipality is a case where there are separate taxi zones for the former City of Halifax, City of Dartmouth, and the surrounding County. In the case of Ontario, regionalized municipalities largely had their former taxi operating areas merged into one (e.g., Toronto, Ottawa).
- **Los Angeles' Franchise System.** Los Angeles awards taxi companies a franchise to serve specific geographic areas within the city. Franchisees must maintain service response times and telephone answer times to a set standard or suffer penalties. Repeat offences may result in removal of the franchise. Franchise areas overlap to provide customers with competitive choices. Details of the franchise system, and the performance monitoring, are available at <https://ladot.lacity.org/what-we-do/taxicabs-vehicle-hire-pipelines/taxicabs> and <https://ladot.lacity.org/sites/g/files/wph266/f/Los%20Angeles%20Taxicab%20Review%20and%20Performance%20Report%202017.pdf>. The City of Los Angeles also collects revenue in the form of a franchise fee per taxi, although fees were substantially reduced in 2016 due to changes in the industry (e.g. competition from TNSs like Uber and Lyft).

Larger jurisdictions do tend to establish operating areas. The province of Quebec, for example, sets regional licensing areas. Quebec's operating areas reflect historical divisions, but are divided into fewer areas than metro Vancouver. For example, the Montreal area is divided into five principal areas: Montreal, West Island, Montreal East, Laval, and Longueuil.

The practice of limiting operating areas is closely linked to the practice of limiting the total number of taxis. For example, limiting the number of taxis in one area would be ineffective if taxis from another area could come in freely. The practice of limiting the number of taxis is common, but controversial. There are arguments on both sides of the issue, and additional questions over whether the practice should apply to all vehicles for hire, or just to those who pick up fares hailed from the street.

The issue of whether or not to limit the number of taxis is outside the scope of this discussion paper. As a result, the discussion here will be limited to the assumption that some operating area rules will need to be established. This includes options ranging from keeping the status quo to instituting a single operating area for all of Metro.

2 Board Criteria and the Role of Licence-share Values

The Board makes its licensing decisions based on three criteria set by legislation:

- public need for the service
- the applicant being capable and "a fit and proper person"
- whether approval of the application would contribute to sound economic conditions in the industry.

Much of this discussion paper is devoted to the impact of alternative policy options on the value of the right to operate an individual taxi, termed a *licence-share* in British Columbia. How does licence-share value relate to the Board's three criteria? The relationship may not be as obvious as it first appears.

Concern of Industry Stakeholders

Many taxi industry stakeholders care a lot of about licence-share value. Much of the dispute about permitting suburban taxis to operate in downtown Vancouver has been motivated by the difference in

the licence-share values for the two operating areas. Vancouver taxi licences generate as much as \$5,000 per month in lease value of the taxi licence. Suburban taxis vary by municipality, up to a reported high of about \$2,000 per month. Were the two operating areas allowed to mix to any degree, more customers would be shared, the value of suburban licences would rise, and the value of City of Vancouver licences would fall. In the past, City of Vancouver companies vigorously opposed any use of suburban taxis to fill shortages downtown on weekend nights.

The issue will continue after the entry of TNSs into the British Columbia market. Before the Uber phenomenon, the value of a City of Vancouver licence-share ran into the hundreds of thousands of dollars based on the monthly lease revenue of the licence. Looking at the experience of other markets after the entry of TNSs, the value of a taxi licence shares is expected to decline substantially. This reflects a decline in the revenue per taxi that generates monthly lease payments. At present, Metro licence-shares are reported to have already declined in value in anticipation of the decline in revenue per taxi after the 2019 introduction of TNSs.

The amount of decline is related to the relative size of taxi dispatch trips versus taxi trips taken from hailing on the street or at taxi stands (termed the *street-hail market*). Taxis typically retain the exclusive right to pick up individuals on the street due to their stricter regulations on safety equipment, vehicle markings, etc.

In cities that are largely dispatch oriented, the increased number of vehicles added by TNSs drives the value of a taxi licence to negligible levels. Taxis operating where street hail is a significant portion of traffic have fared better, but still experienced dramatic declines. For example, Toronto has an active street-hail taxi market. Toronto taxi plates have reportedly fallen in value from around \$360,000 to \$30,000.³ New York has a very active street hail market. The value of a New York taxi medallion rose from \$25,000 in 1962 to over a million dollars in 2013.⁴ Following the introduction of Uber and Lyft, prices declined significantly. As of 2018, medallion prices were reported to be around \$160,000.⁵

Issue Will Continue After TNS Entry

While all taxi licence-shares will decline significantly in value, the impact will not be uniform. The City of Vancouver taxi licences will decline less than suburban ones due to the higher proportion of street-hail fares. The *relative* difference in licence-share values between the municipalities will continue. On a proportionate basis, the difference might actually increase.

Taxi industry stakeholders who hold licence-shares will continue to be concerned about changes in operating areas, or cross-boundary rules that will erode their relative positions. City of Vancouver taxi companies will continue to resist changes that admit suburban taxis and erode their relatively better position with exclusive rights to the downtown street-hail market.

Relationship to Statutory Criteria

While these declines are dramatic and painful for those who hold the rights, their relevance depends on the Board's interpretation of the third criteria "promoting sound economic conditions".

Regulators have a general duty to ensure a regime where private licensees can earn a *just and reasonable, or fair and reasonable*, rate of return on capital invested. The capital invested refers to the investment in equipment and overhead to establish operations. If the regulator fails in this duty, operators will not be able to cover costs and the industry will decline and collapse.

³ <https://www.thestar.com/news/gta/2018/11/02/toronto-taxi-owners-sue-city-for-17-billion-over-arrival-of-uber-lost-plate-value.html>

⁴ https://en.wikipedia.org/wiki/Taxi_medallion as of January 2019.

⁵ <https://ny.curbed.com/2018/6/11/17450366/nyc-taxi-medallions-bankruptcy-auction>

In general, taxis continue to operate following the entry of TNSs. Taxis remain a valued service that customers are willing to pay for, and that many prefer. In this basic sense, sound economic conditions continue.

Just and reasonable rate of return is defined as the normal rate of return available from alternative investments of similar risks. It is helpful to understand that taxi licence-shares only begin to acquire value when the regulator restricts the number of vehicles to less than public demand supports. This tends to happen when a city grows, but additional new fleet authorizations does not expand to match this growth.

In unrestricted markets, the worth of a licence-share on its own is zero.⁶ When a licence is available to qualified applicants directly from the regulator, no one will pay more to get it from a private party. When markets are limited and fleet-size is not expanded to keep pace with population growth, then a taxi shortage develops. Customers wait longer for a taxi at certain times, and taxis become busier. The busier taxis generate extra revenue, to the point where the taxi is more profitable than other comparable investments. At this point, people will pay to buy the right to operate a taxi.

By definition, the existence of licence-share values indicates above normal rates of return, and the regulator's duty to ensure the opportunity for adequate rates of return is more than met. The Board is free to interpret the requirement for sound economic conditions more broadly. However, the fundamental common law requirement is met.

Traditionally, other transportation regulators have been concerned about licence values out of a sense of fairness and equity, rather than viability of the industry. While some licence holders may have acquired their licences decades ago and reaped many rewards, there will also be those who bought their licence-share at market peak, with borrowed money. These stakeholders will experience severe financial hardship from declines. Typically these include career taxi drivers who mortgaged their houses to finally own the rights to the taxi they drive.

Where regulators have been empowered to provide compensation for changes in licence-share value, they commonly look at individual cases of hardship (e.g., Ireland). Alternatively they may limit compensation to those who hold just one or two licence-shares (e.g., State of Victoria, Australia). Large scale holders of taxi licences are considered in a different light – having undertaken a business risk that should have been understood.

3 Context: Industry Stakeholders, Licence-Share Value, and Driver Income

Before analysing policy options, it is helpful to consider the different stakeholders in the taxi and TNS industries. Each stakeholder group will be affected differently by changes in PT Board licensing. Only a portion of taxi stakeholders are affected by changes in licence-share value.

Stakeholders in the Taxi Industry

Taxi companies apply to the Passenger Transportation Board, seeking the right to operate a fixed number of taxis in a given area.⁷

⁶ If the licence-share is linked to ownership of the company, then there will be a nominal value associated with the equity value in the company. Many BC taxi companies are organized as cooperatives so that a licence-share brings with it a share in the actual company.

⁷ For further detail, please see *Modernizing Taxi Regulation* (2018) Hara Associates for the BC Ministry of Transportation and Infrastructure.

Each successful taxi company is granted authority to operate a given number of taxis by the PT Board. A PT Board licence is a single licence for the fleet. In urban areas, where taxis are in short supply, the right to operate these taxis is a valuable commodity. It is common practice for BC taxi companies to offer *shares* in the PT Board licence. These are termed *licence-shares*. These are private sales, not on the public record, and not endorsed or monitored by the PT Board or the municipality.

One licence-share may be the right to operate one taxi (through the taxi company that holds the PT Board licence). However, in markets like Vancouver, where taxis are particularly profitable, the licence-share is the right to operate a single taxi in either the day shift *or* the night shift. Thus two licence-shares would be associated with one taxi.

The holder of the licence-share receives revenue. Taxi drivers pay fees by the shift, by the week, or by the month for use of the taxi. Fees vary depending on whether the driver provides their own vehicle, the fuel type of the vehicle if it is a company vehicle, the value of the shift (Friday night costs more to drive), etc. Bundled with the fees drivers pay, directly or indirectly, is a fee for the use of the taxi licence-share. The fees for the licence-share are paid to the licence-share holder who purchased that share.

The revenue paid to the licence-share holder varies by region and can be substantial. In interviews, industry stakeholders report that the right to operate one taxi under a PT Board licence leases for as much as \$5,000 per month in Vancouver, \$2,000 per month in the larger of the municipalities surrounding Vancouver, and much less elsewhere.

After the initial sale of the licence-share by the taxi company, there is an ongoing after-market in which licence-shares may be bought and sold. These are also private sales, not on the public record. However, going rates of exchange will be commonly known in the industry. Day-shift licence-shares and night-shift licence-shares may have different prices.

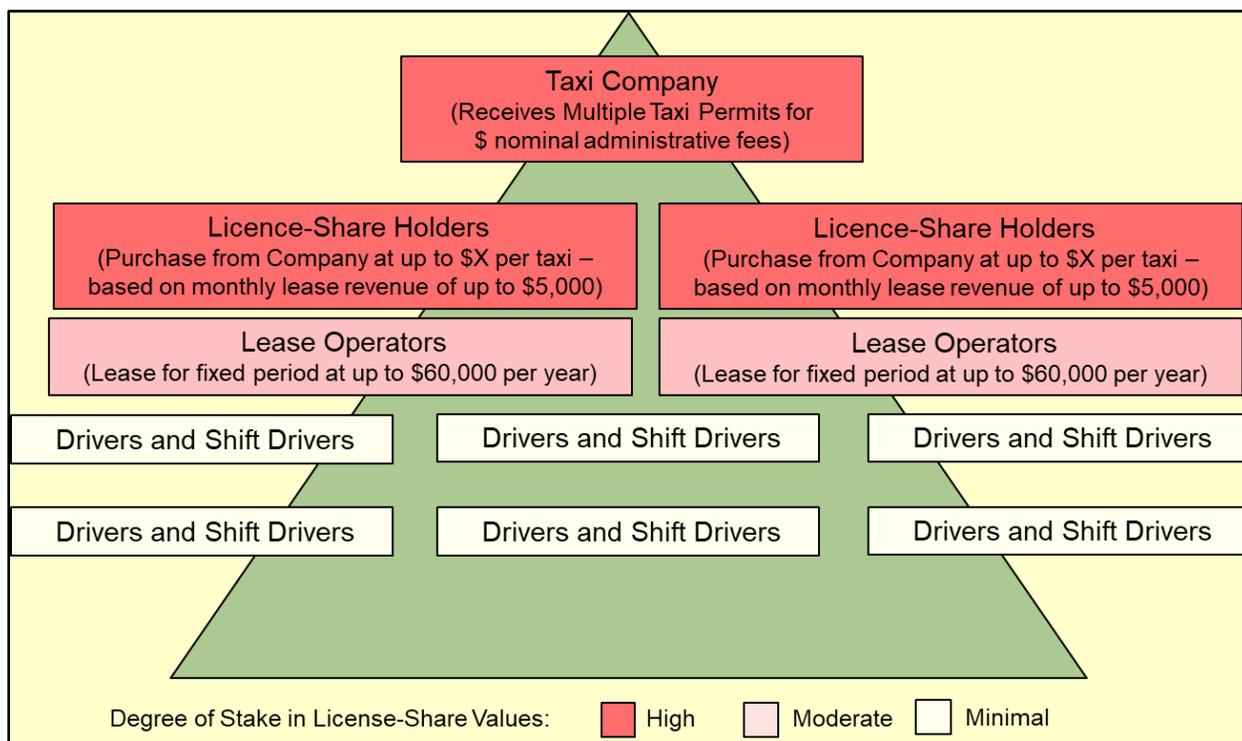


Figure 4: Taxi Industry Stakeholders and Relative Exposure to Changes in Value of Licence-Share

Licence-share prices are influenced by uncertainty about the future. Given the expected entry of TNSs like Uber and Lyft into the market, the future revenue levels of taxis are uncertain. Thus, the present value of licence-shares has fallen substantially, even though the current fees paid to holders continue to flow. Like other investments, licence-share value is also influenced by prevailing interest rates and other general economic conditions.

The relationship of stakeholder groups to the value of a licence issued by the PT Board is illustrated in Figure 4. The licensed operator of the taxi is not necessarily the one who drives the taxi. Drivers fall into these broad categories:

- **Owner Operator.** This is an active taxi driver who also holds a licence-share. They do not pay a lease for a licence-share because they have their own. This driver may also provide his or her own vehicle. For shifts where they do not drive, they may use other drivers and collect a fee that incorporates the going rate for the use of a licence-share. Owner-operators may use the taxi company as their agent to manage the filling of shifts with other drivers.
- **Lease Operator.** This is a driver who wishes to control their vehicle like an owner operator, but cannot afford, or chooses not to purchase, a licence-share. Instead, they lease a licence-share from the holder, usually paying a monthly fee on a lease of a year or more. Like the owner-operator, they may drive themselves but fill unused shifts with other drivers.
- **Shift Driver.** This term covers other drivers who do not hold or lease licence-shares.⁸ *These drivers comprise the majority of the industry.* For example, the City of Vancouver has more than four taxi chauffeur permits for every taxi vehicle. Since there cannot be more than two licence-share holders for a vehicle (day- and night-shift) and since many licence-share holders do not actively drive, the shift-drivers are the majority of people actually driving taxis.

For shift drivers, renting the use of a licence-share is part of the fixed cost paid for every shift. Like other drivers, the usual arrangement is that they receive money from passengers, pay their fixed costs and fuel, and keep the balance.

Relationship of Operating Area Boundaries to Value of Licence-Shares

Changes to operating area boundaries affect the value of licence-shares. Licence-shares are valued because of the lease revenue they generate. As discussed earlier, taxi shortages mean busier taxis and higher lease revenue in a given operating area.

If border rules are relaxed to let outside taxis come in to respond to shortages, then the revenue of the existing taxis in that area falls, as does the lease revenue their licence-shares can command from drivers. For this reason, there was strong resistance from Vancouver area taxi companies to the PT Board's decision that allowed 38 suburban taxis serve the downtown on weekend nights.

Relationship of Operating Area Boundaries to Driver Income

The impact of such changes is not shared equally among taxi stakeholder groups. Taxi companies and licence-share holders bear the brunt of any decline in licence-share value. Licence holders set the licence lease rate as high as the market will bear, meaning they have to leave drivers with enough money at the end of the day to keep them from seeking work in a different occupation. When taxi revenue falls, the holders of a licence-share must reduce the rate charged for the taxi licence by a similar amount. If they do not, the driver will not have enough money at the end of the day and will seek employment elsewhere.

⁸ In alternative usage, the term "shift driver" can refer more narrowly to drivers who rent vehicles by the shift on a walk-in basis, as opposed to those committed to a regular number of shifts per week.

Thus driver income is only minimally affected by a change in operating area boundaries. While most drivers earn only a basic income, that amount is unaffected once the lease payments they make drop to offset a reduction in taxi revenue. By the same token, drivers also benefit very little from rule changes or rate increases that increase the revenue per taxi, since the holder of the licence-share will raise lease payments to match.

Owner-drivers, who hold licence-shares, do bear the burden of changes. However that burden stems from their ownership of a licence-share, not from driving. Lease operators bear the burden to the extent that they are locked into a fixed term on their lease before rates can be renegotiated.

TNS Stakeholders

TNS companies and drivers also fall into distinct groups. Among companies, there are:

- **International TNSs.** These include established companies like Uber and Lyft. There are also others such as Grab in Southeast Asia, and Didi in China.
- **Canadian national TNSs.** Companies such as Tappcar and Instaryde have expanded from their local base to operate in other Canadian cities.
- **Potential local BC TNSs.** Local BC companies may emerge. These may be new services of taxi companies, current underground operators who seek legitimacy, or even charitable organizations looking for a framework to manage volunteer transportation, such as transportation for the elderly.

TNS drivers also fall into distinct groups: There are:

- **Short term drivers.** The bulk of drivers for TNSs are short term. The ease of signing onto an app makes this a larger group than those who are willing to go to a taxi company office and sign out a car. The turnover of drivers in this group is high as their attachment to the industry changes with experience and life circumstance.
- **Full time drivers.** In other jurisdictions, a portion of drivers are full time. Many of these are former taxi drivers who prefer the flexible work hours and financial structure of TNSs. Others in this group include those who might not be comfortable driving for a traditional taxi company. This includes people with physical disabilities, such as the mute, who can rely on the TNS app to receive directions and process charges. (With most apps, talking to the driver is not necessary, although it generally is encouraged). For similar reasons, new Canadians who are still learning English can find immediate employment when relying on apps.
- **Part Time Long-term drivers.** These are drivers who find a permanent part-time niche in which they are comfortable. Drivers for TNSs typically include retired people, the self-employed who drive TNS when their main business is slow, commuters who convert their commute time to money by charging for shared rides, and others who want convenient flexible part-time hours to add to their income and savings.

Will TNS licences Acquire Licence-share Value?

Most other jurisdictions have taken the approach of not limiting the number of vehicles operated by TNSs. Since the supply of licences is not limited, no value has accrued to TNS licences.

If the PT Board is liberal in its licensing, then no value will accrue to TNS licences. However if the Board limits the number of TNS licences to fewer than public demand supports, then

- the licences will accrue value in the same way that taxi company licence-shares have accrued value, at the expense of customer service; and
- early applicants, fortunate to get the limited supply, will receive offers from other companies as each TNS operator, international and domestic, strives to get an adequate operating share of licenced vehicles.

4 POLICY OPTIONS FOR CROSS-BOUNDARY TRIPS

Rule Changes versus Operating Area Reform

The Board has already taken steps to reduce deadheading, trip refusals, and related efficiency losses by changing rules to facilitate shift changes. For example, taxi companies may now apply to the Board to permit day and night shifts to be served by different taxis, allowing drivers to complete long trips at the end of their shifts.

There are two further ways to address these problems. One is to redraw or merge operating areas to reduce their number and increase their size so as to better reflect the economic integration and trip habits of the region. The second is to change the rules governing trip boundaries.

The merger of operating areas is a big step, and potentially a contentious topic among taxi industry stakeholders. For example, the merger of any operating area with the City of Vancouver area will create winners and losers among those who hold taxi licence-shares. In merged areas, the value of licence-shares will average out to a common value, with City of Vancouver holders on the losing end. A similar story is true for other operating area mergers.

Another drawback of merging operating areas is that the best data to guide such a decision will not be available until after the new legislation regime has been in place for some months. Individual trip data will be reported after that point. But it will take time to get the data collection system running and to process the data. Once trip-level data is available, it will be possible to look at the origin-destination pairs of trips and better judge where to draw operating area boundaries.

For these reasons, the Board may first wish to investigate changes in boundary rules using the present operating areas. If a reasonable solution can be found, the significant decision on merging operating areas might be deferred until more is known about how the new regime is operating. There is also the possibility that the taxi industry itself may unite in the face of competition from TNSs and suggest its own merged boundary solutions.

This section discusses options for changes in the rules governing cross-boundary trips. The options apply to both taxis and TNSs. However, the substantive discussion is how the options affect taxis, especially given the taxis' exclusive right to pick-up street hail.

The options may also be applied in combination with any later merger of operating areas.

The Current Cross-Boundary Rule

Each licence issued by the PT Board has its own rules. However, there are common themes across licences. The Board also maintains a template to guide licence drafting and standardize terminology.

The present rule for cross-boundary trips used in most licences is very restrictive. It is summarized below, with terminology currently used by the Board in *italics* and (parentheses).

- A taxi may take a passenger from anywhere in the taxi's operating area (*originating area*), and take them anywhere in British Columbia.
- A taxi may pick up passengers outside its operating area only if:
 - The passenger is returning to the taxi's home area (*originating area*); **and**
 - The passenger
 - prearranged the return trip while making the earlier outgoing trip; (*return trip*); or
 - The passenger is billing the trip to an active account with the taxi company that was established before the trip was arranged. (*limited reverse trip*).
- A trip booked through a taxi smartphone app does not count as an "active account" for the purpose of allowing *limited reverse trips*.

The last item was added when the Board issued its *Apps for Passenger Directed Vehicles Rule*. Without this qualification, the smartphone apps rule would have inadvertently undermined the existing cross-boundary rules. A well-functioning app allows credit card payment, and would have made all users account holders.

With this rule, there are very few customers taking return or reverse trips, and significant deadheading and trip refusals by drivers. Relatively few passengers use corporate accounts, and most passengers do not want to prearrange their return trip in advance. Even if they like the company of the outgoing taxi, they usually prefer not to tie themselves down to a return trip. The convenience of flexible timing and on-demand service is why they use taxis.

Alternative Cross-Boundary Rules

There are alternative rules that make it easier for taxis returning to their home operating area to fill their seat with a passenger. However, the more liberal the rule, the closer the net effect is to merging zones. This means there will be an impact on the value of licence-shares, with winners and losers as shortages in one zone are met by taxis in another zone. The trade-off is public need and convenience and efficiency on one side and the impact on present industry taxi licence-share holders on the other.

For TNS operators the policy framework is simpler. Since they are not yet in operation, they have no historical stake. The Board need only consider what is technically more efficient. TNS operators can work with any rule. The key question for potential TNS operators is the size of the operating area they will be licensed for. This issue is addressed in subsequent sections of this paper.

For taxis, a more relaxed boundary rule creates the opportunity to reduce deadheading, but does not in itself put a passenger in the taxi returning from outside its home area. A taxi driver still faces the problem of connecting with passengers going their way. Traditional telephone dispatch is problematic, since potential customers will tend to phone the dominant firm in the local area. The out-of-area taxi will not be known or available to the dispatch service that the customer has phoned. To effectively reduce deadheading and trip refusals, a degree of cooperation is necessary between taxi companies operating in different areas. Cooperation can take the form of coordinated traditional dispatch (technically difficult), or a shared smartphone app marketed to passengers.

Thus the impact of relaxed rule options depends not only on the types of cross-boundary trips that are permitted, but also on how a relaxed rule affects the ability of taxi companies to cooperate. The last step of actual cooperation is the responsibility of taxi companies themselves.

More relaxed boundary rules may take two forms:

- A *universal* rule that applies at all times to all licensees.
- *Case specific* rules that change by time of day, type of vehicle, or type of licensee.

Looking at universal rules, principal alternatives to the present approach include:

- A. Unlimited Reverse Trips for App Booked Trips (e.g., apps count as accounts).** This option relaxes the rule for trips booked through a smartphone app. It withdraws the interpretation imposed by the Board's app rules. Although a minimal change, it increases the number of potential customers greatly. The change allows a taxi app to be the mechanism for drivers to connect with passengers taking cross-boundary trips. Companies that choose to cooperate through their apps, or with a shared app, can assign trips efficiently to taxis returning to their home zones. From the user perspective, the passenger will just enter their desired destination when booking the trip and their chosen app will assign the nearest eligible taxi.

An attractive feature of this approach is that it allows taxi companies to effectively compete with TNSs in for passengers who use smart-phones, while leaving each company's regional advantages in traditional markets untouched. City of Vancouver companies would retain their street-hail market downtown, without more suburban taxi competition. Local advantages in traditional telephone dispatch would also remain with each company in each region.

The existence of TNSs strongly affects the advantages of this scenario. Prior to TNS entry, downtown taxi companies would have vigorously opposed *any* rule that allowed suburban taxis into their markets because of the adverse impact on their revenues and licence-share value. In the presence of vigorous TNS competition, the remaining licence-share value is tied primarily to just the street-hail rights.

Thus, this option minimizes the impact on taxi licence-share values.

By the same token, suburban taxis still would be limited in how they could assist in relieving downtown taxi shortages. They could accept app-based requests, but not street hails. When the streets are crowded at bar closing, many passengers still prefer to hail a taxi rather than engage an app and try to connect with a specific driver.

- B. Unlimited Reverse Trips for Dispatch and App-Booked Trips.** This option takes the additional step of allowing taxis to accept dispatch calls as well as app calls when returning to their home area from outside. By widening the opportunity it reduces deadheading further, however the impact will be largely as a result of commuters and shoppers making return trips to home areas. It will not help to clear entertainment districts, since the use of traditional dispatch at bar closing is problematic for passengers.
- C. Unlimited Reverse Trips.** In a further relaxation of the rules, a taxi or TNS could take a passenger from anywhere in Metro to the vehicle's home operating area. This would reduce deadheading further by allowing taxis to accept street-hail fares when seeking customers for trips back to their home operating area.

For example, this approach allows suburban taxis to take customers at taxi stands going to the airport, and to join the queue of taxis helping to clear downtown entertainment areas at closing. However, it introduces some awkwardness. To be compliant, the driver must ask the passenger where they are going, and refuse if the customer is not going to the driver's home area. In many cases, the driver may not bother, introducing an enforcement issue. It is also possible that drivers and passengers would become used to the new rule. Frequent customers may know to recognize and hail only taxis that are from their home municipality.

By opening the hail market to sharing, this option further levels the differences in licence-share values.

- D. Unlimited Dispatch and App Trips.** This option leaves the street-hail market as it is presently, but allows taxis and TNSs to move freely throughout the Metro area. The idea of *reverse trips* is dropped and taxis are not restricted to taking passengers back to their home area.

Effectively, this option is a merger of operating areas into a single Metro area for dispatch purposes. Companies would remain anchored to their traditional service areas because they retain the right and duty to serve street-hail in their respective areas.

An attraction of this approach is that it eliminates deadheading and increases competition in dispatch space, while leaving differences in licence-share values relatively untouched. Although all taxi licence-share values will all fall with the entry of TNSs, the remaining value will be based on each taxi company's unique right to the street-hail market in their area. By leaving the street-hail market as it is currently, the difference in licence-share values between municipalities is preserved.

A drawback of this approach is that suburban taxis are not permitted to assist in clearing downtown entertainment areas by picking up street-hails.

A further impact is that taxi service levels will tend to even out between suburban municipalities and downtown municipalities as the available supply moves to where the demand is. If service is short downtown, and more plentiful in the suburbs, this difference will disappear. However, in the context of the large increase in supply from the admission of TNSs, service in all municipalities may be expected to improve (see discussion on impact of TNS entry further below).

The most relaxed rule would be to allow all of dispatch, app and hail trips to go anywhere within Metro. This option is not really a rules option. It is a merger of all operating areas into a single Metro zone. This option is discussed under options for changing operating areas.

Other options vary cross-boundary rules by time of day, or by type of vehicle. Three options are offered for consideration:

- E. Unlimited Trips During Peak Demand.** In its most extreme form, this option would drop operating area restrictions during designated hours, such as weekend and holiday evenings, or rush hour.

During these times, taxis could take dispatch, app, or street hail between any two points within Metro Vancouver. TNSs would still be restricted from picking up street hails.

An advantage of this approach is that it simplifies how taxis serve street hail. A suburban taxi responding to a street-hail in downtown Vancouver no longer has to interview the customer as to whether they are returning to the suburban taxis home area. Instead, they can accept any street hail and take the customer wherever they want to go within the Metro area.

Another advantage is that the impact on regional differences in licence-share values is relatively low. If the peak hours are where the existing taxi supply has difficulty meeting demand, then the additional taxi trips will come from competing more effectively with TNSs, rather than having suburban taxis taking trips from City of Vancouver taxis.

Halifax, one of Canada's largest land area municipalities, adopted this approach to allow all taxis to help clear out the entertainment district on weekend nights.

A moderate variation of this rule would be unlimited reverse trips (back to the home area) during peak demand.

- F. Unlimited Trips for Accessible Vehicles.** This variation drops operating area restrictions within Metro as an incentive to provide accessible vehicles. It largely applies to taxis, since TNSs rarely provide accessible service unless required to do so. Accessible taxis are part of the dispatch pool and serve both regular customers and accessible taxi requests. Under this option, an accessible taxi could serve trips across the region for *all* customers. The increased freedom is intended to reduce deadheading and help offset the additional costs of providing accessible service.

A risk of this approach is that it can backfire if parallel measures are not taken to ensure an adequate supply of accessible taxis. It is common to expect accessible taxis to be on priority call for accessible taxi customers. If there are too few of these vehicles, and they are expected to serve the entire Metro area, then accessible taxi drivers may end up frequently driving across the region empty to serve a priority call. Such extensive deadheading would be a disincentive to driving accessible taxis, resulting in fewer drivers willing to do so. As the number of accessible taxis declined, deadheading for long distances would increase.

To be an effective incentive, this approach must be accompanied by parallel measures to ensure an adequate density of accessible taxis throughout the region.

- G. Duty to Serve a Specific Area for Selected Licensees.** This variation imposes a duty to respond to dispatch and app calls in a specific area. The area may be a sub-set of the operating area. For example, a TNS might be licensed to serve all of Metro, on condition that it responds to calls in specific areas, such as a municipality or group of municipalities on the periphery.

Another example would be an application by a community cooperative for a broad operating area, with the idea that it will commit to respond to calls from its home community. A small community (e.g. White Rock) might launch a community TNS to ensure it receives the service it desires. This example is more likely to occur if the government adopts a licensing fee/trip fee framework which gives lower fees to community based organizations.

What makes this approach different from current practice is the *requirement* to answer dispatch/app calls. At present, operating areas are granted on the assumption that the applicant *wants* to serve these areas. Licensed companies are not actually required to respond to calls. The only *duty to serve* requirement is for street-hails, where individual taxi drivers are not permitted to refuse a street-hail or a request at the head of a taxi stand, unless the trip is outside their licensed area. (Duty to serve on street hail is discussed in greater detail in the next section).

If a duty to serve is to be required for telephone or app requests, then the issue of enforcement arises. Some monitoring of fulfilment of the commitment to respond to calls may be called for. The net effect would be similar to the *Los Angeles taxi franchise system* mentioned earlier. Los Angeles taxi companies holding a franchise must commit to respond to calls in their franchise area, with an operating standard of X% answered in Y minutes, and an associated standard of telephone call answering performance.

An advantage of *duty to serve* for specific areas is that it provides opportunity to leverage the attractiveness of serving the profitable downtown markets by requiring a company who wishes to serve that area to commit to serve the less profitable outlying areas.

A disadvantage of this approach is that it imposes costs that are inconsistent with TNS business models and, to a lesser extent, with taxi business models. Both models are predicated on independent drivers who choose which trips they wish to accept. It is difficult for the TNSs or the taxi company to *make* a driver answer a call, especially if it is far away from the driver's current location. The TNS regulates this through higher prices to attract enough drivers to serve an area, but their model can break down if there are not enough interested drivers in a rural area at all times of day. To meet this commitment, a TNS or a taxi company may have to maintain a set of drivers who are employees, or are paid on a different basis from the others. Uber, for example, does this in Toronto to provide wheelchair accessible service. Uber Access drivers receive a significant dollar subsidy for each trip, plus assistance in acquiring a wheelchair accessible vehicle. However, this approach is costly and only accepted by Uber and other TNSs because of the richness of the balance of the Toronto market.

Forcing larger providers to cross-subsidize service to outlying areas also means it is less likely that local community providers will emerge. For example, if Uber or Lyft is taking revenue from downtown to ensure it meets its license requirements in a small municipality, then any local provider in that community is effectively forced to compete with subsidized competition.

Another disadvantage is that it can place the Board in competition with other branches of government for the potential revenue available from TNSs and new taxis. The government may seek to raise revenues to support accessible transportation through its own program of per-trip fees and license fees. To the extent that the Board extracts available surplus through service conditions – there will be less room for license fees and per trip fees. For example, branches of government may feel that is more cost effective to collect per trip fees from TNSs to subsidize accessible taxis than to impose requirements to have TNSs provide the service themselves. Similarly, whatever service conditions are imposed by the Board, they will compete with revenue programs intended from per trip fees and licence fees.

The latter disadvantage is less present in the case where community organizations are applying to serve, and also to qualify for receiving a break in fees. In this case, the duty to serve app/telephone calls incorporated in the licence might be regarded as a quid-pro-quo to establish eligibility for reduced fees.

Tables 1 and 2 summarize the above options in terms of the Board's statutory criteria: public need and ensuring sound economic conditions for the industry. Table 2 options may be taken as stand-alone, or in combination with a Table 1 option.

Enforcement Considerations

Enforcement of cross-border rules is challenging for any jurisdiction. For taxis, the classic method of enforcement is in person by enforcement officers. For example:

- Officers may pose as a customer and flag an out-of-area taxi on the street or call a company to an out-of-area address.
- Officers may observe an illegal pickup, often at common street flag areas, and follow until there is an exchange of funds or the meter is turned on. The usual practice is to wait until the customer has been dropped off, and then stop the driver of the taxi.

Both of these methods are time intensive and costly, even when performed by municipal Bylaw officers in enforcement blitzes. Now that operating areas are the exclusive jurisdiction of the Passenger Transportation Board, the challenge is greater. The Registrar has only a few enforcement officers to cover the entire province.

In practice, enforcement of taxi operating areas is also assisted by companies and drivers who spot taxis from out of area when they make illegal pickups, and make complaints to the enforcement authority. However, this will not happen so easily with TNSs, who are likely to be less marked and where drivers are less likely to know each other's vehicles and spot the outsider.

Table 1: Alternative Universal Rules Governing Cross Border Trips

PT BOARD Legislated Criteria		A Unlimited Reverse Trips for Apps	B Unlimited Reverse Trips for Apps and Dispatch	C Unlimited Reverse Trips for Apps, Dispatch, and Street Hail	D Unlimited Trips of Any Kind for Apps and Dispatch
Public Need		App users can use same company app coming and going. Fewer trip refusals for all customers because taxi less likely to deadhead on return trip. Some relief to peak period shortages in downtown municipalities.	Both app users and dispatch users can use same company coming and going. Even fewer trip refusals and more relief of peak period shortages than in option to left.	Both app users and dispatch users can use same company coming and going. Users can street hail a taxi from their home area to return home. Even fewer trip refusals and more relief of peak period shortages than in options to left.	App and dispatch users can take any taxi anywhere within Metro. Street hail users still restricted to current rules in taxis they may hail. Possibly greatest reduction in trip refusals and relief of peak period shortages than in options to left. Exception: less relief for taxi shortages in the street hail market at bar closing than in Column C. Service quality differences between downtown and suburbs will move to a common average.
Sound Economic Conditions	Industry as a whole	Reduced deadheading and greater efficiency.	Even greater reductions in deadheading and increases in efficiency than option at left.	Even greater reductions in deadheading and increases in efficiency than options at left.	Possibly the greatest reductions in deadheading and increases in efficiency than options at left.
	TNS Stakeholders	Prefer the greater flexibility for their exclusively app-based service (Same A,B,C).	Prefer the greater flexibility for their exclusively app-based service. (Same A,B,C).	Prefer the greater flexibility for their exclusively app-based service. (Same A,B,C).	Prefer the greatest flexibility for their exclusively app-based service (makes TNS operating area all of Metro).
	Taxi Stakeholders	Taxi companies able to compete more effectively with TNSs. Downtown taxi companies lose a slight amount of licence-share value; suburban taxi companies gain slightly . Drivers have reduced deadheading experiences.	Taxi companies able to compete more effectively with TNSs. Downtown taxi companies lose a slight amount of licence-share value; suburban taxi companies gain slightly . Drivers have reduced deadheading experiences.	Taxi companies able to compete more effectively with TNSs. Downtown taxi companies lose significant licence-share value; suburban companies gain significantly . Drivers have even greater reductions in deadheading experiences.	Taxi companies able to compete more effectively with TNSs. Downtown taxi companies lose a slight amount of licence-share value Drivers have even greater reductions in deadheading.

Table 2: Case Specific Alternative Rules Governing Cross Border Trips

PT BOARD Legislated Criteria		E. Unlimited Trips During Peak Demand	F. Unlimited Trips for Accessible Vehicles	G. Duty to Serve App/Telephone Requests in a Specific Area
Public Need		<p>App users can use any company during peak periods. Reduced shortages at peak periods, as taxis throughout region move to where demand occurs.</p> <p>Customers can street hail any taxi during peak periods, without being interviewed as to whether their destination matches the taxi's operating licence.</p>	<p>Greater service for those needing an accessible vehicle, due to incentive effect for drivers of freedom to move across region.</p> <p>May backfire if there are not complementary efforts to ensure enough accessible taxis. Drivers may be forced to deadhead further across region to serve accessible calls.</p>	<p>Offers an opportunity to require better service for under-served areas by leveraging the attractiveness of serving downtown.</p> <p>May prevent local companies from developing in those underserved areas.</p> <p>May compete with other government revenue based programs by appropriating available surplus with in-kind service requirements.</p>
Sound Economic Conditions	Industry as a whole	Reduced deadheading and greater efficiency during peak periods.	Better ability to attract drivers for accessible vehicle shifts (provided there are complementary efforts to ensure enough accessible vehicles).	<p>Imposes additional operating costs to provide a service that might not otherwise be provided.</p> <p>Potential local TNS or taxi companies may not develop because of cross-subsidized completion.</p>
	TNS Stakeholders	TNSs prefer the greater flexibility for their exclusively app-based service.	May not feel relevant unless TNSs are required to provide accessible service. There is a TNS preference for the taxi industry to provide this service.	Extra costs are higher for TNSs because it forces them to move beyond being an app with voluntary drivers, to managing a fleet with drivers who are required to serve certain calls – makes the TNS operate more like a taxi company
	Taxi Stakeholders	<p>Taxi companies able to compete more effectively with TNSs.</p> <p>Downtown taxi companies lose a <i>slight</i> amount of licence-share value; suburban taxi companies gain <i>slightly</i>.</p> <p>Drivers have reduced deadheading experiences.</p>	<p>Taxi companies are better able to fill their required accessible taxis with drivers.</p> <p>Drivers of accessible taxis benefit from freedom of movement for <i>all</i> trips, offsetting the higher cost of serving accessible taxi requests.</p>	Similar but lesser cost increases for taxi companies, who also use independent drivers who decide to accept/reject each trips.

However, with electronic trip reporting and online real-time dispatch, there are alternative methods of enforcement. For example:

- It is possible to establish computer reports to identify trips that are potentially contrary to rules. Depending on the new rules, some violations will be obvious. For example, if pickup and drop-off both occurred outside the operating area – this would seem to be a violation (unless allowed as under some of the alternative rules). In other cases, an individual cross-border trip might be pre-arranged, but drivers/operators who had an excessive amount of cross-border trips might be asked to show their records.
- Officers may, at some point, also have real-time access to TNS app systems. This would allow them to determine if a pick-up was by a currently licensed TNS vehicle, and if the pick-up was arranged through the TNS app, or was an illegal street hail. This would empower the limited number of officers to do spot checks, or work with police to deter fake TNS predators during bar closings.

For every enforcement strategy, there is also an evasion strategy by those who break the rules. In the context of full trip reporting, the evasion strategy is to make a cash or fixed price arrangement with customers. For taxis, unless the meter is turned on, the dispatch system does not know that a paid trip is under-way, so no trip is reported. Evasion in this way is easier for taxis, since they take street hails and can negotiate. Evasion is more difficult for TNSs, who tend to work through credit cards, and for who all calls are supposed to be through the app. Thus a TNS driver wishing to break the cross-border rules would likely have to first illegally take a street hail, and then convince a customer to pay cash or give their credit card for swiping by a third party device (e.g. Square). TNS customers will tend to treat the latter with suspicion, since a point of convenience for TNSs is automatic credit card payment through the app.

In summary, enforcement of cross-border rules will be more challenging due to the switch from municipal officers to the Registrar's limited force. However, the challenge can be offset and probably more than overcome by enforcement use of the full trip data that will now be required. Further assistance will come if real-time access to TNS dispatch systems can be established for enforcement officers.

When choosing alternative border rules, the fewer the borders the lower the burden of this difficult enforcement area.

5 POLICY OPTIONS FOR TAXI OPERATING AREAS

Another approach to reducing deadheading and trip refusals is to rationalize licensed operating areas to match the current urban form and degree of regional integration. This section addresses taxi operating areas. TNS operating areas are addressed in the next section.

Modernizing taxi operating areas means fewer and bigger areas so that the origin and destination of passenger trips is largely captured within the borders. Two approaches to drawing new boundaries are:

- **Consultation in conjunction with review of current urban form using aerial views and street maps.** Maps reveal gaps and natural barriers that influence travel time and consumer habits. This approach uses data that is easily accessible. However, in a highly integrated region, people simply travel around these barriers. Thus consultation with current licensees can identify the broad areas that should be integrated. Natural gaps in the road system can be used to manage exactly where the boundaries are.

- **Consultation in conjunction with origin-destination trip data.** A more accurate source of information is data on the origin and destination of individual trips taken by users of taxis (and TNSs). This data is only sporadically and partially available from commuter surveys. However the new legislative framework requires the reporting of all trip data. This opens the door to a comprehensive analysis of where boundaries should be.

Licence-Share Value as a Merger Criterion

Another factor to consider is the value of licence-shares (or monthly lease rate for licence-shares). Merging operating areas means that the licence-share values of all companies will tend towards a common average. Merging a rich area with a poor area means a gain in licence-share value for the poor area companies at the expense of a loss in the richer area.

There will be less industry resistance to mergers where the value of taxi licences is similar between regions. For example, if a larger downtown operating area is desired, it is helpful if the municipalities surrounding the City of Vancouver have similar licence-share values. At present, no municipality surrounding the City of Vancouver generates close to the same monthly lease revenue for a taxi licence-share. However, the gap may narrow following increased competition from the entry of TNSs

The Board may wish to ignore this consideration, or it may wish to consider the fairness of redistributive impact on licence-share holders in the affected areas.

Policy Options

There are three broad choices for the Board's approach to taxi operating areas:

- A. **Status Quo.** Leaving taxi operating areas as they are will avoid the contentious issue of mergers, about which taxi stakeholders will have strong and divergent opinions. It also leaves in place the problems of deadheading and trip refusals that are caused by the outdated current borders based on municipal boundaries.

The Board may decide that it can use modifications in boundary rules (discussed previously) to mitigate deadheading experiences, and leave the issue of merging operating areas aside until more data is available, or a consensus emerges among taxi stakeholders.

- B. **A few large operating areas.** The Board can merge operating areas and redraw boundaries to rationalize them. For example, casual observation suggests that a more functional system would merge the City of Vancouver taxi operating area with at least the surrounding municipalities – creating a larger central area. Similarly, larger areas could be created to the North, to the East, or to the South.

Larger areas will reduce the deadheading and improve flexibility of supply at peak periods.

Service quality differences between municipalities will even out to a common average in merged areas. Merging the City of Vancouver with surrounding municipalities would improve taxi service in the City of Vancouver, at some expense to the suburbs. However, this impact on suburban service would be minor in comparison to the overall improvements in service resulting from the addition of TNS vehicles to the total fleet.

We should note that there is a common misunderstanding that when suburbs are merged with downtown: it is that all the taxis go downtown. This does not happen for more than a few days or even hours. Drivers quickly realize that if there are too many taxis competing for fares downtown, they will lose money, and some will return to the suburbs until supply matches

demand in each neighbourhood. The learning experience is rapid since taxi drivers can observe the length of dispatch queues in each dispatch zone on the displays in their taxi.

Parallel to the averaging of service levels is the averaging of revenue per taxi, and the averaging of the value of licence-shares between companies in the area. Again, this means winners and losers among licence-share holders.

Another positive feature of larger operating areas is that it may offer service improvements to peripheral areas. Municipalities on the periphery (e.g., White Rock) feel they need and deserve more service. Including peripheral areas in larger operating areas allows taxi companies in neighbouring areas to extend service. Again, today's operating area boundaries are likely outdated and prevent incremental expansion of taxi companies into developed areas nearby.

- C. One operating area for all Metro.** If travel patterns are extremely integrated, then it may make sense for all Metro Vancouver to be one operating area. This certainly reduces deadheading by allowing companies to fill their taxis with customers regardless of where the last trip took the taxi.

Enlarging an operating area is not without costs. For example, it should be recalled that taxis (unlike TNSs) have a *duty to serve*. Taxis accepting a street hail or a customer at a taxi stand are required to take that customer anywhere they want to go within the taxi's operating area. The PT Board licence conditions require this, as is common in many jurisdictions. The duty to serve goes with the exclusive right of taxis to pick up street hails. The rules do not permit the driver to discriminate between types of passengers, with the limited exception of health or safety reasons or lack of funds.

In the context of a single operating area for all of Metro, the *duty to serve* means that a taxi accepting a street hail would be required to go anywhere in the Metro region. This may be acceptable if passengers normally move back and forth over these distances. The taxi could then expect to find a return trip. However, if the whole of Metro is an overextension of the natural boundaries defined by passenger origins and destinations, then the likelihood of finding a paying return trip would be low. The *duty to serve* would become an excessive burden for the unlucky driver. A Vancouver taxi driver may be willing to take a passenger all the way to Kamloops – but the decision to do so should be *voluntary*.

Merging Metro into one operating area would also invite criticism from taxi licence-share holders: those holding higher value licences in the central areas would lose significant value, largely eliminating the value that remained after absorbing the impact of competition from TNSs.

Table 3 summarizes the above options.

6 Policy Options for TNS Operating Areas

Transportation Network Service companies will be a new kind of service. They will offer passengers the choice of an exclusively app-based booking service with automatic payment. While similar to taxi service, TNS services are distinct in several respects. These include: exclusive reliance on smartphones in place of taximeters and, if permitted by the Board, variable pricing. There may also be a different culture, driven by the new practice of rating drivers (and passengers) at the conclusion of each trip.

Likelihood of a Significant Increase in Passenger Directed Vehicles

Before beginning operation, each TNS must successfully apply to the Passenger Transportation Board for a licence. That licence may restrict the number of vehicles a TNS may operate or have on the road during a set time period.

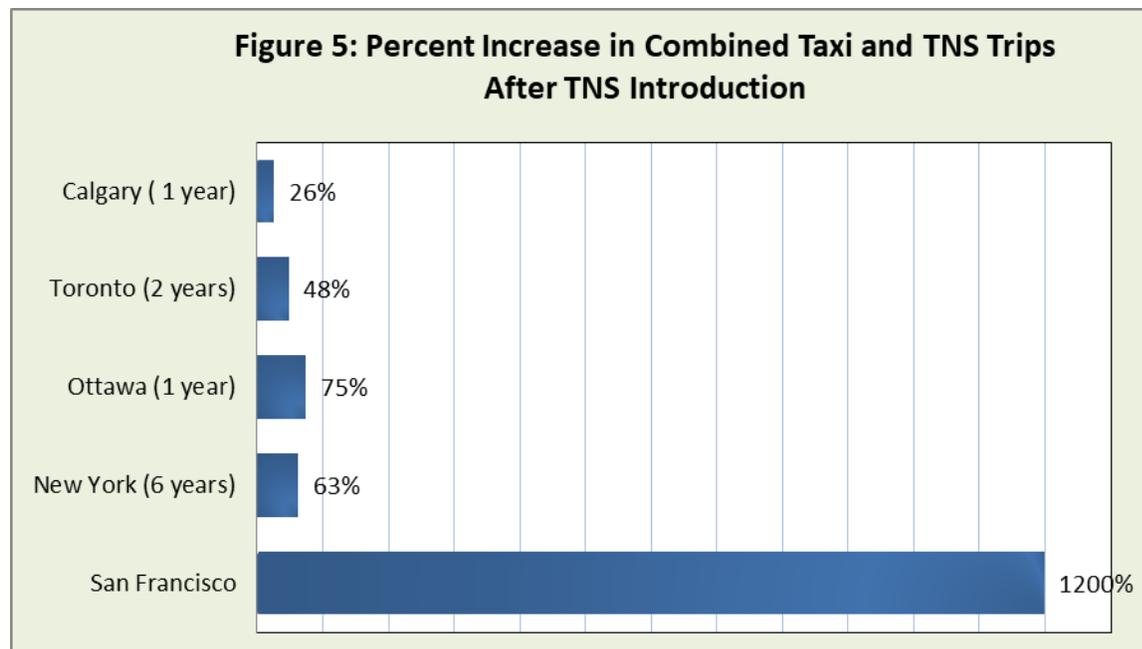
Table 3: Alternative Approaches to Taxi Operating Areas.				
PT BOARD Legislated Criteria		A Status Quo	B Fewer, Larger Areas	C One Operating Area for All Metro
Public Need		Continued trip refusals, moderated by any changes to cross-boundary rules the PT Board adopts. Continued peak period shortages of taxis, moderated by the large increase in fleet service by TNSs.	Reduced trip refusals as drivers are enabled to pick up return trips from a larger area. Fewer taxi shortages at peak as taxis are freer to move across the region to fill demand hotspots. Averaging of taxi service levels within new operating area. This may not be noticeable in context of the large increase in fleet service by TNSs	Reduced trip refusals as drivers are enabled to pick up return trips from a far larger area. Potential of trip refusals on street hail from drivers who do not want to go great distances. Averaging of taxi service levels across all of Metro. This may not be noticeable in context of the large increase in fleet service by TNSs
		Sound Economic Conditions Industry	Industry as a Whole	Current efficiency losses from deadheading and trip refusals, moderated by any changes to cross-boundary rules the PT Board adopts.
TNS Stakeholders	See table summarizing TNS operating area options.		See table summarizing TNS operating area options.	See table summarizing TNS operating area options.
Taxi Stakeholders	Differences between taxi licence-share values will be retained. Note that all taxi-licence shares will have fallen in value in the face of competition from TNSs.		Remaining taxi licence-share values will average out within the newly merged areas. There will be winners and losers.	Remaining taxi licence-shares values will average out within the entire region. Given the joint impact of TNS competition, the likely result is a decline of licence-share values to negligible levels.

If the Board decides to give the business model of TNSs a full chance to operate, this will likely mean a significant number of vehicles relative to the number of taxis. There is a minimum scale necessary to achieve reasonable service response time within a given area. If there are too few vehicles, then there is unlikely to be one available near a customer when they call. To give the TNS model a full opportunity to operate, a minimum density of vehicle coverage is needed for TNSs that is comparable to today’s taxi fleets.

From the perspective of public need, the evidence from other jurisdictions is that adding the TNS option to consumer choice results in large increase in demand for trips. Figure 5, shows the percentage increase in combined taxi and TNS trips after TNSs are introduced in cities where the combined taxi and

TNS volume is publicly available.⁹ The number varies by length of time for the market to mature, and local circumstance. However, the general pattern of a large increase in trip demand is clear.

From both the perspective of minimum efficient scale, and public need, the PT Board is likely to find itself authorizing a significant increase in the overall fleet of Passenger Directed Vehicles.



Impacts of TNS entry at scale

Before assessing policy options for TNS operating areas, it is helpful to visualize the different policy environment that will exist once TNS vehicles are licensed.

TNS entry at the anticipated fleet numbers would likely result in:

- **Reduced revenue per taxi.** Taxi total shares may rise if the taxi fleet is also increased, but the present high utilization per taxi from restricted supply would come to an end. We note that Board has already authorized a 15% increase in the taxi fleet, where requested. Vancouver fleets have also been expanded significantly in the past few years.
- **Reduced value of taxi licence-shares.** The lower revenue per taxi means that the premium charged for leasing taxi licences will also decline, along with an associated decline in the sale value of the taxi licence-share. Results will vary by municipality:
 - Municipalities where taxi trips are primarily dispatch will see licence-share value driven down to negligible levels.
 - Municipalities where taxi trips have a large street-hail component will likely retain a small portion of their licence-share value. With the introduction of TNS, taxis retain the exclusive right to pick up passengers hailing from the street, a privilege that normally extends to an exclusive rights to taxi stands. However, the reduction in licence-share value would still be substantial. As noted earlier Toronto taxi plates have reportedly

⁹ From *Modernizing Taxi Regulation*, pages 1-3.

fallen in value from around \$360,000 to \$30,000.¹⁰ The value of a New York taxi medallion rose from \$25,000 in 1962 to over \$1,000,000 in 2013.¹¹ As of 2018, however, medallion prices are reported to have fallen to \$160,000.¹²

The drop in licence-share values will impose hardship on some licence-share holders, especially those who bought into the industry recently at full price.

- **Fewer trips will be street-hail.** One reason for the decline in taxi licence-share value is that fewer trips will be by street-hail. Under old telephone dispatch, it was impractical to telephone for a dispatch taxi to an office or shopping location during peak demand periods. Even where a company agreed to send a taxi, the driver would likely be snagged by someone hailing from the street before it reached the telephone customer. With smartphone apps, the distinction between street-hail and dispatch fades. With a credit card posted against the account, and communication through an app, it is more practical to use an app to call for a vehicle (taxi or TNS) on the street. *This diminishes the value of the taxi monopoly on street hail.*
- **Taxi response times will improve.** Increased supply of TNS vehicles during peak periods takes pressure off the taxi system. As some taxi customers switch to TNS service, there are more taxis available for the remaining taxi customers.
- **More trips will be taken.** Customers will respond to the better supply of vehicles, and the reliable availability at peak periods, to take more trips. More people may be expected to go out to dinner or entertainment at night. Shopping becomes easier to access. Business travel and work trips also become more feasible. The gross increase in trip volume is illustrated in Figure 5.
- **Taxis will remain operating.** The experience of other jurisdictions is that taxis do not disappear nor is their number reduced. There is a market for taxis which continues to support a sustainable business. Individual companies or operators may seek bankruptcy protection if they over-leveraged by borrowing against the value of the licence-shares, but the taxi business itself remains a going concern.
- **Drivers who are owner-operators will experience financial hardship.** Like all those who hold taxi licence-shares, owner-operators will experience financial hardship. The burden will fall most heavily on those who bought into the industry at peak price with borrowed money.
- **Income from driving will be unaffected in the long run, but rise in the short run.** As discussed in the previous section – the majority of drivers do not have a stake in the value of a licence – share. Their net earnings will remain stable. There may be a temporary boost in net earnings as there will be a shortage of drivers when both TNSs and taxi companies are competing for the same pool of drivers. In the longer run, drivers can move between TNS and taxi service. This labour mobility ensures that competitive incomes will remain on equivalent levels for both types of service.
- **Employment opportunities will open for new kinds of drivers who would not have considered driving taxis.** The greater part time opportunities, the flexible hours, and the use of one's own car, attract a broader range of drivers. The expanded fleet and trip volume means employment opportunities for the retired, for self-employed business people with slack time, and for commuters who wish to earn money while sharing rides on their daily trips to and from work. The functionality of apps means less reliance on speech, creating driving opportunities for those with speech difficulty, or new Canadians who are still learning our language(s).

¹⁰ <https://www.thestar.com/news/gta/2018/11/02/toronto-taxi-owners-sue-city-for-17-billion-over-arrival-of-uber-lost-plate-value.html>

¹¹ https://en.wikipedia.org/wiki/Taxi_medallion as of January 2019.

¹² <https://ny.curbed.com/2018/6/11/17450366/nyc-taxi-medallions-bankruptcy-auction>

- **Taxi drivers will have alternative employment.** In other jurisdictions, we see that many taxi drivers become TNS drivers. Drivers who switch like the flexible hours and other service differences. Drivers who remain with the taxi industry also have a better bargaining position, improving their ability to negotiate their working conditions and net returns.
- **Outlying and rural areas of Metro may experience improved service.** A feature of TNS service that has been noted by BC's small municipalities is that it permits individual operators to offer service easily. A rural retired person may join a TNS through the internet or through the TNS app and, after the required criminal record check and potentially, the acquisition of a class 4 driver's licence, begin offering service at whatever hours they prefer. They may use their smartphone to book on while peeling potatoes in their kitchen. If a call comes through their smartphone, they hop in their car to serve it.
- **Niche markets may be served.** If the PT Board takes a liberal position on opening TNS applications, then firms may enter to serve specific public needs. In Winnipeg, there is a TNS that specializes in serving Aboriginal communities with Aboriginal drivers. Other proposals have been made to specialize in woman drivers for women. Volunteer communities may use the TNS licence to provide a framework for insured service. For example, there may volunteer service TNSs for driving the elderly and infirm to medical appointments.
- **Greater use of slack capacity in off-peaks if the Board permits flexible pricing.** Flexible pricing is part of the TNS business model. In addition to high prices during peak periods, the model also offers lower pricing in off-peak periods. The lower prices promote higher vehicle use in times when they would otherwise be idle.
- **Potential environmental and social benefits.** There may also be long term environmental and social benefits if the improved service and availability of passenger directed vehicles results in reduced car ownership..

Taxis as TNSs

Taxi service and TNSs may not be entirely separate. There is a strong possibility that existing taxi companies will seek to license TNSs. Depending on the insurance options available from ICBC, they may even seek to operate the same vehicles as both services – operating under app rules when answering an app call.

Individual taxis may also seek to operate as taxis, but receive calls through TNS apps. In some cities, Uber offers Uber Taxi as an option. In the City of Toronto, Uber uses accessible taxis to answer accessible vehicle requests when Uber's own vehicles are unavailable.

Another possibility is that taxi companies will seek to license separate fleets of TNS vehicles and of taxis. The TNS vehicles may operate as a separate service, or they may be painted to look and feel like a taxi bearing the same company colors as a taxi. Present Board regulations do not address the area of "taxi colours", aside the requirement for identifying vehicle numbers.

Joint operation of taxi and TNS vehicles can also occur under the banner of shared taxi company apps, such as those proposed by the Vancouver Taxi Association or the BC Taxi Association.

These possibilities raise issues beyond the scope of this paper. However, when we imagine TNS stakeholders, these may include currently licensed taxi companies.

TNS Operating Area Options

Because TNS service has not yet begun, there are no historical issues around the accumulated value of licence-shares. Consequently, the Board has greater leeway to make the best technical choice on TNS operating areas.

TNSs preference would likely be for very liberal operating areas that would leave each service free to develop as both drivers and customers became available in each area. Customers seeking to use a TNS in unserved areas would receive messages stating either that no cars were available in their area, or that their area was not yet served.

Note that, like dispatch taxis, there presumably would be no *duty to serve*. Duty to serve is usually applied to street hail fares, which is an exclusive preserve of taxis.

The most contentious question facing the Board is how large to make TNS operating areas *relative to taxi operating areas*.

The idea of a “level playing field” may lead some to argue that TNS operating areas should match taxi operating areas in size and borders.

Others may feel that TNS service is an opportunity to remedy the absence of a region wide service. A historical example of this approach is Seattle, where one fleet of taxis was licensed to the city, while another fleet of taxis was licensed to the combined city and surrounding county.

Policy considerations fall within three broad policy options:

A. Current Taxi Operating Areas and Matching TNS Areas

This option would have TNS operating areas along municipal lines, matching the present taxi operating areas.

The attraction of this option is the level playing field. If taxis are to be left with the disadvantages of their current operating small operating areas, then TNS would be required to operate on a similar basis.

The disadvantage of this approach is that it extends the existing issues of deadheading from cross-boundary trips. The present taxi operating areas are outdated and, based on evident urban growth and media reports of trip refusals, may be too small. The new TNS services would be saddled with the same problems.

Another disadvantage is that smaller outlying municipalities may not receive TNSs. Smaller municipalities are expecting TNSs to resolve current shortfalls in taxi service. If TNS companies must apply separately for each municipality, they may choose not to apply to serve smaller outlying areas.

A more moderate version of this option would be to rationalize taxi operating areas into fewer and larger areas, and match TNS service to these new areas. However, the present government's schedule calls for implementation of TNS service in fall 2019. Further delay of TNS introduction is unlikely to be popular. Waiting to reorganize taxi operating areas would involve a significant further delay of TNS implementation.

B. Current Taxi Operating Areas and One Metro Operating Area for TNS

This option uses TNSs to remedy the absence of region wide service.

A drawback to the approach is that it gives TNSs a competitive advantage over taxi service, which would remain disadvantaged with deadheading and small outdated operating areas. *However, it is possible that taxi licensees could counter with their own TNS licenced vehicles, marketed under an app or shared app. From this perspective, the playing field might still be termed level.*

A potential advantage is the possibility that service to smaller municipalities and rural areas could be improved. As discussed above, the TNS business model lends itself to participation by individual local drivers using their own vehicles on a part time basis.

C. Single Metro Operating Area for Both Taxis and TNSs

Broad brush solutions are sometimes quicker to implement. The Board could choose to give TNSs the flexibility to serve the entire Metro area, and then merge all taxi operating areas into one to put the taxi industry on an equal footing with TNS service. The approach would be one of principle, and not subject to extensive discussion about boundary lines as would the delay required to create multiple operating areas within Metro.

While TNS companies might welcome this simplified approach, it has the drawbacks for taxis discussed in the previous section on taxi operating areas. These include disproportionate losses in taxi licence-share value for downtown taxi companies, and issues with *duty to serve* for taxis receiving long distance requests at taxi stands.

It is also not clear if this is the kind of level playing field that taxi companies would want, given that they are free to launch their own TNS services, while retaining whatever advantages they see in their current taxi operating areas.

The impacts of the options are summarized in Table 4 (next page). In examining the alternatives, it is important to remember that licensing TNSs will change the environment in which both types of service operate. Table 4 includes some of the changes that are common to all three TNS policy options. Key differences between options are highlighted in red.

7 Conclusion

This paper has identified some of the principle policy options for the PT Board decisions on operating areas and boundary rules of passenger directed vehicles. The analysis has been undertaken in the context of new legislation, and the introduction of Transportation Network Services as a new class of service planned for the fall of 2019.

Options have been discussed in the context of the Board's legislative criteria for licence decisions, supported by Hara Associates' understanding of the industry and the observed experience of other jurisdictions. The choice of options is left to the Board.

Table 4: Policy Options for TNS Operating Areas

PT BOARD Legislated Criteria		A Current Taxi Operating Areas Matching TNS Areas	B Current Taxi Operating Areas One TNS Metro Area	C Single Metro Area Both Taxi and TNSs
Public Need		Larger fleet means faster and more reliable service and better service at peaks. More choice of service types. Some trip refusals and shift change issues remain. Some municipalities may not be served by TNSs.	Larger fleet means faster and more reliable service and better service at peaks. More choice of service types. Some trip refusals and shift change issues remain for taxi users. Potential TNS service to all Metro municipalities	Larger fleet means faster and more reliable service and better service at peaks. More choice of service types. Taxi service improvements in suburbs partly offset by some taxis shifting downtown. Trip refusals significantly reduced for all passengers. TNS potentially available to all Metro municipalities
Sound Economic Conditions Industry	Industry as a whole	Increased size of sector overall, more vehicles and passengers. Efficiency: Reduced vehicle idle time if flexible pricing allowed. Efficiency losses from unnecessary deadheading continue.	Increased size of sector overall, more vehicles and passengers. Efficiency: Reduced vehicle idle time if flexible pricing allowed. Only taxis experience continued losses from unnecessary deadheading. Comparative disadvantage.	Increased size of sector overall, more vehicles and passengers. Efficiency: Reduced vehicle idle time if flexible pricing allowed. Deadheading much reduced for both TNSs and Taxis.
	TNS Stakeholders	TNS companies acquire new business in BC. New types of drivers gain opportunity as TNS drivers.	TNS companies acquire new business in BC. New types of drivers gain opportunity as TNS drivers.	TNS companies acquire new business in BC New types of drivers gain opportunity as TNS drivers.
	Taxi Stakeholders	Taxi fleet unchanged or expanded with part time vehicles. Major reduction of licence-share values for companies, and individuals, including driver shareholders. Smaller impact on lease-drivers. Risk of temporary bankruptcy by over-leveraged taxi companies. Taxi drivers gain alternative as TNS drivers, improve flexibility and/or terms of employment if they stay with taxi.	Taxi fleet unchanged or expanded with part time vehicles. Major reduction of licence-share values for companies, and individuals, including driver shareholders. Smaller impact on lease-drivers. Risk of temporary bankruptcy by over-leveraged taxi companies. Taxi drivers gain alternative as TNS drivers, improve flexibility and/or terms of employment if they stay with taxi.	Taxi fleet unchanged or expanded with part time vehicles. Disproportionate losses in licence-shares for downtown taxi companies. Major reduction of licence-share values for companies, and individuals, including driver shareholders. Smaller impact on lease-drivers. Risk of temporary bankruptcy by over-leveraged taxi companies. Taxi drivers gain alternative as TNS drivers, improve flexibility and/or terms of employment if they stay with taxi.