

GL6.31 Attachment 5

CITY OF TORONTO
MUNICIPAL LICENSING AND STANDARDS

ECONOMIC IMPACT ANALYSIS OF TORONTO'S TAXICAB, LIMOUSINE, AND PRIVATE TRANSPORTATION COMPANIES

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OVERALL FINDINGS

WSP Canada undertook a study for the city of Toronto's Municipal Licensing and Standards (MLS) Division, to explore the economic and social impacts of the Vehicle-for-Hire and Private Transportation Company (PTC) industries in the city since the introduction of Chapter 546, Licensing of Vehicles-for-Hire in 2016. The objective of this project was to understand the economic impacts of the Vehicle-for-Hire By-law on residents and the City, consumers, drivers, and the taxicab and limousine industry as a whole. With the arrival of PTCs in 2012, subsequent expansion of services to ridesharing in 2014 in the city of Toronto, and the introduction of Chapter 546, the vehicle-for-hire landscape has seen a shift. While the study aims to improve the quality and scope of information, the limitations encountered included the amount and accessibility of data in the taxicab, limousine, and PTC industries; the low response rate from the driver survey; and the relatively recent emergence of PTCs and few years under regulation. As part of the 2019 Review of Chapter 546, an Economic Impact Analysis has been developed to include the following sections:

- **Background Research and Methodology:** Focused on a review of the past and current vehicle-for-hire and PTC landscape in the city of Toronto and comparable jurisdictions in North America. Stakeholder interviews were conducted to gather industry perspectives on the entrance of PTCs and the Chapter 546 regulations in 2016 and their impact on taxicabs, limousines, and PTCs for both industry and drivers.
- **Economic and Social Changes Affecting Residents, Consumers and the City:** This section focuses on the evaluation of the quality of life, consumer choice, access, tourism, and environmental changes in the city of Toronto using a combination of qualitative and quantitative analyses.
- **Economic Impacts to Drivers and Industry:** Focused on the impacts related to the vehicle-for-hire and PTC industries as well as their drivers. A driver survey was administered to both vehicle-for-hire and PTC drivers in order to understand the opinion of the Chapter 546 regulations, ability to work in the industry, as well as ridership and revenue figures. The driver survey was used to develop supply and demand relationships, economic valuation, and impact to ancillary industries.

INDUSTRY CONSULTATIONS

WSP conducted a total of 13 interviews with representatives from the vehicle-for-hire and PTC industries to gather information on the opinions of the emergence and regulation of PTCs and economic impacts of PTCs in the city of Toronto.

Vehicle-for-Hire Interviews

Seven vehicle-for-hire interviews were conducted with various taxicab drivers and industry representatives. Most interviewees indicated that the entrance of PTCs and subsequent regulations has resulted in an oversupply of drivers in the city but that it has also required the vehicle-for-hire industry to embrace new technologies in order to compete going forward. Most drivers believed that the entrance of PTCs, and subsequent licensing, negatively impacted their quality of life as the demand for trips has decreased, resulting in longer shift durations to achieve their 2014 revenue levels, that drivers are leaving the industry, and the value of plates continues to decline. Many interviewees believe that the entrance of PTCs and subsequent regulation has decreased consumer safety (namely from the removal of mandatory training), increased congestion and Vehicle Kilometres Travelled (VKT), diminished the public image of taxicabs, and left a feeling of abandonment.

Interviewees self-reported a decrease in demand and revenues, primarily with streethailing as dispatching is still used by corporate accounts, contracts with institutions, and the older population segments. Most drivers saw a change in trip types with the majority occurring on evenings and weekends and has also shifted towards shorter trips within the central business district (CBD).

PTC Interviews

Six PTC interviews were conducted with both drivers and industry representatives. When asked about the industry's initial perception of PTCs, all respondents agreed that the arrival of PTCs in Toronto provided positive benefits for consumers who saw increased choices, and potential drivers as they felt that existing barriers to entry into the market were removed. Most interviewees indicated that the vehicle-for-hire regulations made little visible impact on the operations of PTCs, but rather solidified their continued operations in the city of Toronto. It was noted that the increased use of PTCs is a result of the existing trajectory and adoption rather than the regulations, and therefore, interviewees were largely indifferent about the regulations. PTCs noted an overall positive impact to their quality of life due to the ability to flexibly earn revenue and the reduction in conflicts with the taxicab industry from being licensed.

In discussing revenue and demand implications, several interviewees indicated an increase in both demand and revenues which was a result of the existing trajectory of the industry as opposed to the regulations themselves. When asked about the type of consumers PTCs encounter, most interviewees indicated that their consumer base has seen an increase in tourists and a slight increase in vehicle occupancy from pooled services, though the economy service is still the most widely used.

ECONOMIC AND SOCIAL CHANGES AFFECTING RESIDENTS, CONSUMERS, AND THE CITY

The economic and social changes affecting the city of Toronto, residents, and consumers were evaluated through the changes to quality of life of passengers, consumer choice, access, tourism, and environmental impacts. The assessment was done using a number of quantitative and qualitative approaches.

Quality of Life and Consumer Choice

Consumer surplus is a measure of economic welfare (or utility) that is gained from the consumption of a good or service and is defined as the difference between the total amount a consumer is willing to pay for a service and the total amount they pay (ie. market price).

In quantifying the consumer surplus in the taxicab and PTC industries in the city of Toronto, WSP utilized data from the Transportation Tomorrow Survey (TTS), and information from the driver survey to understand consumers' behaviour when the market price changed over time. Data from census years 2011 and 2016 were used to represent the market prior to PTCs entering the city of Toronto (2011 census year) and a market consisting of PTCs in a regulated environment (2016 census year). In July 2016, the vehicle-for-hire regulation was implemented which reduced the base fare for taxicabs from \$4.25 to \$3.25, while introducing a minimum base fare and per trip fee for PTC rides of \$3.25 and \$0.30, which resulted in a base fare increase of \$1 as a response to the regulations.

Overall, the combined total consumer surplus (total for all users) for the taxicab and PTC industry as a whole increased from \$255.7 million in 2011 to \$368.6 million in 2016. This was mainly due to the entrance of PTCs in 2012, making the city of Toronto vehicle-for-hire market more competitive. On the one hand, the entrance of PTCs generated \$176.1 million in surplus for PTC consumers, because it allows them to experience a new service at lower generalized cost. On the other hand, it negatively impacted the taxicab industry by decreasing a total of \$63 million in surplus for taxicab consumers, mainly due to a decrease in demand for taxicab services. While the 2016 regulation generated \$12.2 million of benefits to the taxicab consumers, it reduced the benefits for PTC consumers by an estimated amount of \$11.5 million, which resulted in a marginal positive consumer surplus of \$0.7 million when isolating for the vehicle-for-hire regulations.

Consumer Choice

The impact on consumer choice was assessed through the change in transportation modes. From the TTS, demand by transportation mode was captured, and it was seen that the overall number of trips between 2011 and 2016 has increased by 2.2%, however, when normalized for population growth, the overall number of trips per person has decreased by 4.5%, even with the introduction of a new transportation option (PTCs). This indicates that PTCs have likely captured the majority of their ridership from other modes. Overall, transit ridership and active transportation modes have seen an increase while ridership for private automobile, automobile passengers, and taxicab ridership has seen a decline.

In addition to the above quantitative measures, some qualitative impacts should be considered and have been outlined below.

Positive Considerations/Impacts	Negative Considerations/Impacts
Considerations of PTC Entrance	
Perceived increase in personal safety through the bi-directional rating system and transparency with trip information.	The rating system may be misrepresentative of a driver if the total number of ratings are low, with discrimination or bias, or due to a perceived inconvenience.
Secure, account-based payment method linked to credit card.	Cash-based users may be restricted from using this service.
Increased consumer choice for services offered and improvements in services offered or amenities.	
Considerations of the Vehicle-for-Hire Regulatory Changes	
Perceived personal safety.	The removal of the mandatory training and refresher courses, and CPR and first-aid training may decrease the overall safety of the industry.
Reduced out-of-pocket costs for customers.	
Background checks for drivers increase consumer safety.	
Increased competition of PTCs may lead to improved overall service of both vehicles-for-hire and other PTCs through additional amenity benefits or customer service improvements in order to stay competitive.	Increased competition may result in a loss of revenue in one market.
Increases the overall insurance coverage of the transportation network.	

Codification of PTC operations into a regulatory framework.	
Increased supply of vehicles-for-hire to meet current and future needs of the population.	There may be an over-supply of drivers at certain times of day and locations which would contribute to increased congestion, traffic issues, and environmental issues.

Access

For this study, access looked at the connectivity of residents to services and activities. In order to measure the impact of PTCs in the city of Toronto, a correlation between the number of daily PTC trips made by residents of a given ward (based on the 44-ward system from the data received) and the population densities were assessed. A strong, positive relationship was found to exist between the number of origin trips by ward and ward density. It was also found that in wards with an average trip per capita above 5 are found in the higher density areas of the city. If these wards were excluded from the analysis, there would be lower correlation between PTC trips and population density.

A second regression was conducted between car ownership and number of origin trips per ward. The correlation coefficient was found to be -0.72, indicating that lower car ownership is associated with higher PTC trips. When controlling for car ownership in the regression between population density and number of trips, the relationship becomes weaker, and within lower density wards, no relationship between the two variables was observed. Further, the relationship between PTC trips and car ownership is stronger than the relationship between PTC trips and population density. Finally, it can be noted that the number of PTC trips has been increasing substantially between 2016 and 2018, particularly in lower-density wards that are situated outside of the CBD, indicating an increase in usage in these areas.

In addition to the quantitative assessment conducted, other qualitative considerations related to access include:

- Increased number of wheelchair-accessible service providers;
- Elderly and youth populations benefit from the increased transportation options and flexibility in travel;
- Benefits from reduced costs, travel, and wait times, route flexibility; and overall mobility for users with credit cards, bank accounts, and smart phones; and
- All users benefit from increased access to locations within the city, and beyond.

Tourism

Toronto has seen an increase in tourism over the years and employs over 329,000 people in tourism-related businesses. With increasing expenditures from the increasing number of visitors, the economic impact of tourism related activities is expected to increase. While this is attributed to a number of events and trends, the entrance of PTCs in the vehicle-for-hire market has some influences on the sector. Qualitative considerations of PTC impacts on tourism include, but are not limit to:

- Familiarity with the platform: As PTCs operate in many international cities, the familiarity of the platform and service offering provide an easy, stress free, and safe transportation option for visitors as well as language options for tourists that may not speak conversational English;
- Flexibility: PTCs offer increased flexibility for consumers, particularly for tourists who may be unfamiliar with an area; and
- Tourists can benefit from time and cost savings from using PTCs over other modes of transportation.

Environmental

In analyzing and understanding the environmental impacts of both the entrance of PTCs into the market as well as the implications of the 2016 vehicle-for-hire regulations, a “differences-in-differences” (diffs-in-diffs) method was used. The diffs-in-diffs method was used to evaluate changes in the vehicle kilometres travelled (VKT) per capita which was used as a proxy variable as external environmental impacts such as greenhouse gas emissions and local air quality (from criteria air contaminants) are linked to overall vehicle travel distances.

The result indicates that while the city of Toronto has seen an overall decrease in VKT from 2011 to 2016, the magnitude of the decrease was expected to be higher without the entrance of PTCs and the 2016 regulation, relative to the city of Vancouver. This is consistent with research in the U.S. that has shown quite substantial increases in VKT as a result of PTC entrance to the market.

In addition to the quantitative assessment, qualitative considerations related to the entry of PTCs and subsequent regulations include:

- Some PTCs include a driver destination feature that filters for trips that put them closer to their own destination at a particular time. This decreases the total deadhead time experienced by a driver;
- Some PTCs offer pooled or shared ride services to increase vehicle occupancy and potentially decrease VKT;
- PTC algorithms focus on time-efficiency and shortest distances, limiting total VKT;
- Vehicle age restrictions under the vehicle-for-hire regulations help ensure that older vehicles are not operating, which may result in more fuel-efficient vehicles used on PTC platforms;
- However, it is possible that total deadhead and idle time in the vehicle-for-hire industry increased as a result of the City permitting PTC operations.

ECONOMIC IMPACTS AFFECTING DRIVERS AND INDUSTRY

The economic impacts affecting vehicle-for-hire and PTC drivers and their associated industries were quantitatively assessed through the changes in driver demographics and opinions, market supply and demand, economic valuation, and ancillary industries.

Driver Survey

An online survey targeting drivers in the vehicle-for-hire and PTC industries was conducted for this study. Due to the low response rate from limousine drivers, the results are primarily focused on taxicab and PTC drivers.

- *Driver Profile:* The majority of taxicab drivers are familiar with Chapter 546. For PTC drivers, compliance with the regulations is automatically notified to them through their PTC application which reduces the need to consult Chapter 546. PTC drivers are in general younger than taxicab drivers, and have a higher household income. Finally, PTC and taxicab drivers were found to have similar education and racial backgrounds.
- *Driver Residence:* The majority of taxicab drivers reside within the city of Toronto with about 34% residing outside, predominantly in Mississauga and Brampton. Within the city itself, a large number of drivers reside in lower density neighbourhoods, away from the CBD. PTC drivers largely reside outside of the city of Toronto with only 47.5% residing within. A large concentration of PTC drivers can be seen in the municipalities surrounding the city such as Mississauga, Brampton, Vaughan, Richmond Hill, and Markham.

- *Agreement with Regulations:* While more taxicab driver respondents agree with the regulations imposed on their industry than those who disagree, the majority of all respondents are not satisfied with the changes adopted in July 2016. The reasons indicated include the licensing of PTCs with different regulations, and training requirement is now removed, though it should be noted that taxicab and PTC services differ and are therefore subject to different regulations. On the other hand, PTC drivers were largely indifferent about the introduction of the regulations into the industry, with the exception of the imposed increase in rates and fares.
- *Quality of Life:* Flexibility of work, job satisfaction, and job stability for taxicab drivers were found to have been negatively impacted since the entrance of PTCs and the vehicle-for-hire regulations have not altered this. PTC drivers reported an overall positive impact to their quality of life since the introduction of PTCs and ridesharing in the city of Toronto, and the 2016 regulation has had little impact.
- *Willingness to Drive:* 46% of taxicab drivers indicated that the vehicle-for-hire regulations “Strongly Decreased” their willingness to drive which corresponds to the findings from the stakeholder interviews that taxicab drivers do not agree that PTCs should be licensed in a different manner than taxicabs. However, it should be noted that PTCs offer different services than taxicabs and are therefore subject to different regulations.
- *Labour Market Outcome:* It is interesting to note, from the self-reported survey, that average taxicab driver earnings and number of trips per week decreased while their average hours of driving increased over the 2012-2018 period, as many drivers had previously indicated that they drive more for less since the arrival of PTCs. In contrast, PTC drivers found their earnings and number of trips per week grew proportionally with their hours of driving, consistent with the economic theory of labour supply.

Market Supply and Demand

A mathematical model was developed to adapt the driver survey data and yield the supply and demand for both taxicab and ridesharing markets. Both industries were found to experience inelastic demand and supply curves where inelastic demand indicates a 1% increase in trip price will lead to a less than 1% decrease in the number of trips demanded. Quantities and prices for each industry were then identified from drawing the supply and demand curves. While the PTC market price-quantity pair is always in equilibrium (i.e., point where the demand curve cuts the supply curve), the taxicab market one is not, due to the regulation which limits quantity.

Economic Valuation

The economic valuation of the vehicle-for-hire and PTC industries in Toronto were assessed using two methods; first, as the sum of the consumer surplus and producer surplus (equal to the total market surplus), and second through the use of Statistics Canada’s input-output multipliers. Both methods showed that the arrival of PTCs resulted in a significant economic loss to the taxicab industry: \$88.2 million if using the first method; and \$72 million if using the second. The impact of the 2016 regulation was however only able to be evaluated using the first method which showed an increase in total economic surplus by \$4.5 million for the taxicab industry, and an economic loss of \$8.8 million to the PTC industry. If the two industries are grouped together, with the arrival of PTCs, there has been an overall increase in economic valuation of \$140.7 million, while the 2016 regulation has caused a marginal economic loss of \$4.3 million.

Impact to Ancillary Industries

Statistics Canada's Input-Output multipliers were used to assess the impact to ancillary industries through the sum of the indirect and induced effects (the resulting impacts of business-to-business transactions and the result of increased personal income, respectively). Overall, the taxicab industry continues to support ancillary industries, but their GDP and employment generated from the taxicab industry had significantly decreased from 2012 to 2018. However, the economic gain from the entrance of PTCs outweighed the economic loss by a large amount of GDP and employment, mainly due to the large number of PTC drivers available on the market.