Text

Description automatically generated with medium confidence

Economics Report

Application # 79999-24

Report Date: October 24, 2024

Contents

[Introduction 5](#_Toc180685236)

[Commencing Investigation 5](#_Toc180685237)

[Application Details 5](#_Toc180685238)

[Area of Study 6](#_Toc180685239)

[Existing Licensees 6](#_Toc180685240)

[Background 7](#_Toc180685241)

[Section 28 Criteria 7](#_Toc180685242)

[PN and SEC Factors 7](#_Toc180685243)

[Report Constraints 9](#_Toc180685244)

[Qualifications 9](#_Toc180685245)

[Factors and Their Indicators 10](#_Toc180685246)

[Demand Factor (PN) 10](#_Toc180685247)

[Trip Volume 10](#_Toc180685248)

[Metro Vancouver Regional District Trip Volume Findings 11](#_Toc180685249)

[Trip Revenue 12](#_Toc180685250)

[Metro Vancouver Regional District Trip Revenue Findings 13](#_Toc180685251)

[Accessibility Factor (PN) 14](#_Toc180685252)

[Number of Wheelchair Accessible Vehicles (WAVs) 15](#_Toc180685253)

[Metro Vancouver Regional District Number of Wheelchair Accessible Vehicles Findings 16](#_Toc180685254)

[Number of Active Vehicles per 1,000 Persons 18](#_Toc180685255)

[Metro Vancouver Regional District Number of Active Vehicles per 1,000 Persons Findings 19](#_Toc180685256)

[Affordability Factor (PN) 20](#_Toc180685257)

[Fare per Kilometre 20](#_Toc180685258)

[Metro Vancouver Regional District Fare per Kilometre Findings 21](#_Toc180685259)

[Safety Factor (PN) 24](#_Toc180685260)

[Service Quality Factor (PN) 24](#_Toc180685261)

[Wait Time 24](#_Toc180685262)F

[Metro Vancouver Regional District Wait Time Findings 25](#_Toc180685263)

[Competition Factor (SEC) 27](#_Toc180685264)

[Concentration Indices 27](#_Toc180685265)

[Metro Vancouver Regional District Concentration Indices Findings 28](#_Toc180685266)

[Innovation Factor (SEC) 29](#_Toc180685267)

[Sustainability Factor (SEC) 29](#_Toc180685268)

[Revenue per Active Vehicle 30](#_Toc180685269)

[Metro Vancouver Regional District Revenue per Active Vehicle Findings 31](#_Toc180685270)

[Taxi Fleet Utilization Rate 32](#_Toc180685271)

[Metro Vancouver Regional District Taxi Fleet Utilization Rate Findings 33](#_Toc180685272)

[Taxi Vehicle Occupancy Rate 34](#_Toc180685273)

[Metro Vancouver Regional District Taxi Vehicle Occupancy Rate Findings 36](#_Toc180685274)

[Peak-Hour Taxi Vehicle Occupancy Rate 37](#_Toc180685275)

[Metro Vancouver Regional District Peak-Hour Taxi Vehicle Occupancy Rate Findings 38](#_Toc180685276)

[Variety Factor (SEC) 39](#_Toc180685277)

[Appendix 1: Technical Methodology 41](#_Toc180685278)

[Demand Factor 41](#_Toc180685279)

[Trip Volume 41](#_Toc180685280)

[Trip Revenue 41](#_Toc180685281)

[Accessibility Factor 41](#_Toc180685282)

[Number of Wheelchair Accessible Vehicles (WAVs) 41](#_Toc180685283)

[Number of Active Vehicles per 1,000 Persons 42](#_Toc180685284)

[Affordability Factor 42](#_Toc180685285)

[Fare per Kilometre 43](#_Toc180685286)

[Safety Factor 43](#_Toc180685287)

[Service Quality Factor 43](#_Toc180685288)

[Wait Time 43](#_Toc180685289)

[Competition Factor 43](#_Toc180685290)

[Concentration Indices 43](#_Toc180685291)

[Innovation Factor 44](#_Toc180685292)

[Sustainability Factor 44](#_Toc180685293)

[Revenue per Active Vehicle 44](#_Toc180685294)

[Taxi Fleet Utilization 45](#_Toc180685295)

[Taxi Vehicle Occupancy Rate 45](#_Toc180685296)

[Peak-Hour Taxi Vehicle Occupancy Rate 45](#_Toc180685297)

[Variety Factor 46](#_Toc180685298)

Economics Report

# Introduction

## Commencing Investigation

This economics report has been produced pursuant to a Board investigation under section 27 of the Act ([Policy Manual](https://www.ptboard.bc.ca/policy-manual)). The Board investigation was commenced on August27, 2024, with respect to application #79999-24.

The Board’s letter of instruction to Senior Economist included the application details, outlined below, along with a request for economic analysis pertaining to the following relevant indicators:

Trip Volume: ü

Trip Revenue: ✓

Number of Wheelchair Accessible Vehicles (WAVs): ✓

Number of Active Vehicles per 1,000 Persons: ü

Fare per Kilometre: ü

Wait Time: ✓

Concentration indices: ✓

Revenue per Active Vehicle: ✓

Taxi Fleet Utilization Rate: ü

Taxi Vehicle Occupancy Rate: ü

Peak-Hour Taxi Vehicle Occupancy Rate: ü

## Application Details

This report was produced for the Board regarding a new application for a taxi licence.

The applicant is MS Taxi Ltd., which is doing business as MS Taxi. The application summary states the following:

There is a need for an additional taxi company servicing West Vancouver, North Vancouver, Vancouver, and YVR. It will positively affect transportation services. As MS Taxi, we will attract new taxi users that will increase the trip volume of all existing and new companies.

Additional details of the application include:

* Proposed operating area: West Vancouver, North Vancouver, Vancouver, YVR
* Proposed fleet size: 30 (25 Conventional; 5 WAV)

## Area of Study

The proposed operating area for this taxi application is mainly within the City of Vancouver, District of West Vancouver, and District of North Vancouver. These municipalities are located in the Greater Vancouver Regional District.

For the purpose of statistical analysis, both taxi and TNS applications are associated with the same Region, as contemplated in the Board’s operating areas policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf), even though taxi businesses do not generally operate at a regional level.

For taxi applicants, the Region is determined based on where the existing or proposed operating area is located. In this case, this taxi application is located in Region 1. The Regional District is also determined based on where the existing or proposed operating area is located.

## Existing Licensees

The Board maintains a database of taxi and TNS licensees approved by the Board and key terms and conditions set by the Board, such as fleets, operating areas, and rates. On a regular basis, this is cross correlated against a list of active licensees provided by the Registrar of Passenger Transportation (Registrar) at the Ministry of Transportation and Infrastructure (MoTI). The Board refers to this database as the “single source of licensee data” or SSOLD. Based on the SSOLD, last updated on September 30, 2024, the following relevant information can be observed about the existing licensees in the area:

* At the municipal level,
  + Number of taxi licensees operating: 8
  + Combined Board-approved maximum fleet size: 1226
* At the Regional District level,
  + Number of taxi licensees operating: 29
  + Combined Board-approved maximum fleet size: 2,384
* At the Region level,
  + Number of taxi licensees operating: 49
  + Combined Board-approved maximum fleet size: 2,604

# Background

## Section 28 Criteria

Under section 28(1) of the Act, the Board must consider the following factors when determining applications:

* Whether the applicant is fit, proper, and capable of providing the service applied for (threshold test);
* Whether there is a public need for the service; and
* Whether the application would promote sound economic conditions in the B.C. passenger transportation business.

This economics report provides the Board with data analysis pertaining only to the “public need” (PN) and “sound economic conditions” (SEC) criteria. It does not speak to the fit, proper, and capable criteria.

## PN and SEC Factors

The Board’s [Policy Manual](https://www.ptboard.bc.ca/policy-manual) provides information on the factors the Board may consider when determining PN and SEC. This economics report will focus on the underlying PN and SEC factors for the Board's consideration in determining whether PN and SEC exist. For clarity, this economics report does not determine whether PN and SEC exist.

Under the public need policy in the [Policy Manual](https://www.ptboard.bc.ca/policy-manual), PN is divided into the following factors:

* Demand
* Accessibility
* Affordability
* Safety
* Service Quality

Under the sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/policy-manual), SEC is divided into the following factors:

* Sustainability
* Competition
* Innovation
* Variety

This economics report examines key indicators of the taxi and TNS sectors in B.C. Each indicator is identified with a primary PN or SEC factor, as indicated in the following chart:

A screenshot of a computer

Description automatically generated

Please note that this economics report does not provide an analysis of the “innovation” or “variety” factors under SEC.

## Report Constraints

Under section 28(5) of the Act and the terms and conditions of licence, special authorization licences, including taxi and TNS, are required to submit trip data. The Board has established [data requirements](https://www.ptboard.bc.ca/data-requirements) outlining the type of trip data that must be submitted. Trip data is submitted by licensees to the Registrar through the Vehicle Safety BC Portal (the Trip Database), also known as the “data warehouse”.

Since only the taxi and TNS sectors are required to report trip data under the data requirements, these are the only sectors eligible for an economics report at this time.

Due to data limitations, only two regions will be analyzed:

* Region 1 – Lower Mainland including Whistler; and,
* Region 2 – Capital Regional District (CRD).

Regional Districts within these Regions may be analyzed so long as there is adequate data reliability for those Regional Districts.

At this time, three other regions will not be included in this economics report due to insufficient data coverage, poor data quality, or unreliable trip data submissions: Region 3 (Vancouver Island excluding CRD); Region 4 (Interior); and, Region 5 (Northern B.C. and other).

## Qualifications

This economics report was authored by the Board’s Senior Economist, Peter Tseng, who is ultimately responsible for the analysis contained in this report.

Peter Tseng has over a decade of experience in economic analytics, policy evaluation, and statistical reporting. He holds a Ph.D. in Economics from the University of Victoria and has held senior roles with the BC Public Service, including at the Ministry of Finance and Ministry of Health.

# Factors and Their Indicators

All analyses in this report are based on data from the Trip Database unless otherwise specified. Technical details of each indicator can be found in Appendix 1.

## Demand Factor (PN)

### Trip Volume (Jun)

Primary Factor: Demand

Description: Trip volume represents, in real terms, the observed quantities demanded for trip services, reflecting the equilibrium between passenger demand and industry supply.

Measurement: Trip volume is calculated as the number of completed trips reported to the Trip Database in an area over a month.

Interpretation: Increases in taxi trip volume or TNS trip volume indicate growth in the quantity demanded in the respective markets. Moreover, a shift in trip volume from the taxi sector to the TNS sector suggests evolving consumer preferences and competition between the two types of partially substitutable services.

It is helpful to note that while taxis and TNS are similar, they are not the same. This means that taxis and TNS, while partially interchangeable, ultimately serve distinct consumer needs and preferences, reflecting their roles as separate yet complementary services in the transportation market. Any higher combined volume of taxi and TNS trips can result from offering passengers greater choice, not the inherent superiority of one service over the other.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the demand factor, which are set out below alongside their corresponding implications on trip volume:

* There are people who require access to, or are seeking access to, or would likely access a new, expanded, or improved passenger transportation service.
  + When the proposed service fulfills previously unmet demand and brings new users into the market, it will result in an overall increase in trip volume.
  + The increase can only be evident after the proposed service is introduced. However, historical trends can provide valuable indications. For example, a steady increase in trip volume over time can signal a growing demand for the taxi or TNS services, suggesting potential usage for the proposed service.
* There are people who would use the proposed service:
  + If the proposed service attracts current users of taxis or TNS, it will result in a redistribution of market share measured by trip volume among existing providers.
  + The redistribution can only be evident after the proposed service is introduced. However, historical trends can provide indications. For example, ongoing shifts in market share of sectors can indicate changes in customer preference.

#### Metro Vancouver Regional District Trip Volume Findings

Table : Metro Vancouver Regional District Trip Volume

A screenshot of a calendar

Description automatically generated

Figure : Metro Vancouver Regional District Trip Volume

A graph of blue bars

Description automatically generated

Analysis and Conclusions:

In March 2024, Metro Vancouver Regional District saw a total of 493,787 taxi trips. On a year-over-year (YoY) basis, the total taxi trip volume increased by 0.82 per cent, while on a year-to-date (YTD) basis, the total taxi trip volume increased by 3.66 per cent.[[1]](#footnote-2) The modest increase in taxi trip volume (3.66 per cent YTD) suggests that the demand for taxi services was stable.

Meanwhile, in March 2024, there were 2,408,838 TNS trips in the Metro Vancouver Regional District. On a year-over-year basis, the total TNS trip volume increased by 47.55 per cent, while on a year-to-date basis, the total TNS trip volume increased by 47.46 per cent. The increase in TNS trip volume was significant (47.46 per cent YTD), indicating strong growth in the demand for TNS services.

Limitations: Quantity demanded does not equate to demand. Quantity demanded refers to the actual number of trips observed, whereas demand includes all potential trips if there were no constraints. There can still be unmet demand due to limited vehicle availability preventing some customers from using the service.

### Trip Revenue (Jun)

Primary Factor: Demand

Description: Trip revenue represents, in nominal terms, the observed quantities demandedfor trip services, reflecting the equilibrium between passenger demand and industry supply.

Measurement: Trip revenue is calculated as the total fare amount of all completed trips reported to the Trip Database in an area over a month.

Interpretations: Increases in taxi trip revenue or TNS trip revenue indicate growth of quantity demanded in the respective markets. Moreover, a shift in trip revenue from the taxi sector to the TNS sector can signify a structural change in market dynamics, suggesting evolving consumer preferences or competition between the two types of partially substitutable services.

As stated previously, it is helpful to note that although taxis and TNS are similar, they are not the same. Taxis and TNS, while partially interchangeable, ultimately serve distinct consumer needs and preferences, reflecting their roles as separate yet complementary services in the transportation market. Any higher combined revenue of taxi and TNS trips can result from offering passengers greater choice, not the inherent superiority of one service over the other.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the demand factor, which are set out below alongside their corresponding implications on trip revenue:

* There are people who would use the proposed service. There are people who require access to, or are seeking access to, or would likely access a new, expanded, or improved passenger transportation service.
  + If the proposed service attracts current taxi or TNS users, it will result in a redistribution of market share as measured by trip revenue among existing providers.
  + The redistribution can only be observed after the proposed service is introduced. However, historical trends can provide valuable indications. For instance, ongoing shifts in market shares of sectors can indicate changes in customer preference.

#### Metro Vancouver Regional District Trip Revenue Findings

Table : Metro Vancouver Regional District Trip Revenue

A screenshot of a computer

Description automatically generated

Figure : Metro Vancouver Regional District Trip Revenue

A graph of blue bars

Description automatically generated

Analysis and Conclusions:

In March 2024, the Metro Vancouver Regional District saw a total of $10,354,294 in taxi revenue. On a year-over-year basis, total taxi revenue increased by 7.85 per cent, while on a year-to-date basis, taxi revenue rose by 6.45 per cent. The increase in taxi trip revenue was modest (6.45 per cent YTD), suggesting that the demand for taxi services was stable.

Meanwhile, in March 2024, the TNS sector had a total of $41,996,572 trip venue in the Metro Vancouver Regional District. On a year-over-year basis, total TNS revenue increased by 30.74 per cent, while on a year-to-date basis, TNS revenue increased by 27.33 per cent. The TNS trip revenue experienced significant growth (27.33 per cent YTD), reflecting a strong increase in demand for TNS services.

Limitations: Quantity demanded does not amount to demand. Quantity demanded refers to the actual trip revenue observed, whereas demand includes all potential trip revenue if there are no constraints. There can still be unmet demand due to limited vehicle availability preventing some customers from using the service.

## Accessibility Factor (PN)

### Number of Wheelchair Accessible Vehicles (WAVs) (Jun)

Primary Factor: Accessibility

Description: The number of wheelchair accessible vehicles can be further divided into two sub-metrics: (1) the number of active wheelchair accessible vehicles and (2) the number of active wheelchair accessible vehicles providing at least one accessible trip. The number of active wheelchair accessible vehicles (WAVs) refers to the total number of vehicles equipped to accommodate passengers who use wheelchairs and that have been in operation in an area over a month. On the other hand, the number of active wheelchair accessible vehicles (WAVs) providing at least one accessible trip refers to the number of active WAVs that have recorded at least one accessible trip in the Trip Database.

Measurement: The number of active WAVs is determined by cross-referencing the list of WAVs reported to the Registrar’s Office during licence renewal with the list of active vehicles (which may not necessarily have provided accessible trips) reported to the Trip Database. Then, the number of active wheelchair accessible vehicles providing at least one accessible trip is determined by limiting the list of active WAVs to those reported as having provided accessible trips. Both metrics can be further normalized per 1,000 persons to indicate their growth relative to the population.

Interpretation: The number of active WAVs indicates the accessibility and inclusiveness of passenger transportation services for individuals who use wheelchairs. Generally, a higher number of active WAVs, especially compared to growth in overall demand (proxied by the number of WAVs per 1,000 persons), indicates a greater level of availability for these individuals. A lack of growth in the number of WAVs (both sub-metrics) would indicate suppliers’ unwillingness to match the demand, potentially due to the high costs associated with WAVs.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the accessibility factor, which are set out below alongside their corresponding implications on the number of active wheelchair vehicles:

* The proposed service provides more or improved service to persons with mobility disabilities, including WAVs.
  + The number of WAVs on the road directly and positively correlates with the extent and quality of service provided to individuals with mobility disabilities.

#### Metro Vancouver Regional District Number of Wheelchair Accessible Vehicles Findings

Table : Metro Vancouver Regional District Number of Active Wheelchair Accessible Vehicles

A screenshot of a calendar

Description automatically generated

Table : Metro Vancouver Regional District Number of Active Wheelchair Accessible Vehicles Providing at Least One Accessible Trip

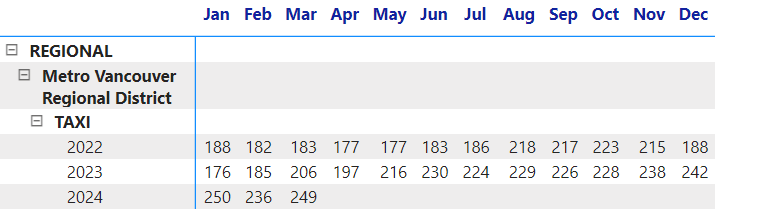


Table : Metro Vancouver Number of Active Wheelchair Accessible Vehicles per 1,000 Persons

A screenshot of a calendar

Description automatically generated

Note: The above table reports the number of WAVs per 1,000 persons up to the most recent year for which annual population data is available from Statistics Canada. As of October 2024, the most recent data available is up to 2023.[[2]](#footnote-3)

Table : Metro Vancouver Regional District Number of Active Wheelchair Accessible Vehicles Providing at Least One Accessible Trip per 1,000 Persons

A screenshot of a calendar

Description automatically generated

Note: The above table reports the number of WAVs providing accessible trips per 1,000 persons up to the most recent year for which annual population data is available from Statistics Canada. As of September 2024, the most recent data available is up to 2023.[[3]](#footnote-4)

Figure : Metro Vancouver Regional District Number of Wheelchair Accessible Vehicles

A graph of a graph

Description automatically generated with medium confidence

Note: The number of Board-allocated WAVs referred to the total number of approved WAVs in the area, serving as a reference line.

Analysis and Conclusions:

In March 2024, Metro Vancouver Regional District saw 297 active WAVs, with 249 of them identified by the Trip Database as having provided accessible trips. On a year-over-year basis, the number of active WAVs in Metro Vancouver Regional District increased from 235 (+62 vehicles, or +26.4 per cent), while the number of active WAVs providing accessible trips increased annually from 206 vehicles (+43 vehicles, or +20.9 per cent). These annual gains suggested that there had been progress in enhancing accessibility for people who use wheelchairs. However, the number of active WAVs in Metro Vancouver Regional District remained below the Board’s approved WAVs (459 vehicles in March 2024), indicating that the full potential utilization of approved WAVs in this area had yet to be realized.

Furthermore, when compared to growth of population, the annual growth in both the number of active WAVs and those providing accessible trips aligned with population growth, suggesting that efforts to improve accessibility have kept pace with demographic changes. On a per 1,000-person basis, the number of active WAVs increased from 0.08 vehicles in December 2022 to 0.10 vehicles in December 2023. The number of active WAVs providing accessible trips rose from 0.07 to 0.08 during the same period.

Overall, while there has been progress in increasing the number of active WAVs, there remains room for improvement in their utilization. In addition, the increases in active WAVs and active WAVs providing accessible trips have kept pace with population growth. In general, a higher number of approved WAVs, when fully utilized, would contribute to enhancing access to passenger transportation services.

Limitations: The number of active WAVs does not capture the Board’s other aspects of accessibility, including accessibility for persons with other disabilities, overall availability of services, essential service levels, service to underserved groups or communities, and inclusion.

### Number of Active Vehicles per 1,000 Persons (Mohsen)

Primary Factor: Accessibility

Description: The number of active vehicles per 1,000 persons represents the total number of vehicles serving every 1,000 persons in an area over a month.

Measurement: The number of active vehicles per 1,000 persons is calculated as the ratio of the total number of active vehicles (including both taxis and TNS) in an area relative to its population, normalized to a per 1,000 persons basis.

Interpretation: A higher number of active vehicles per 1,000 persons indicates higher accessibility to services in the area, as more taxis and TNS vehicles are available to serve every 1,000 persons.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the accessibility factor, which are set out below alongside their corresponding implications on the number of active vehicles per 1,000 persons:

* The proposed service enhances availability of passenger transportation services to everyone in the province, including in low density areas, such as rural and remote communities.
  + A higher number of active vehicles per 1,000 persons directly and positively correlates with greater service availability.
  + The number of vehicles per 1,000 persons in low-density areas provides an area-specific assessment of overall service availability.

#### Metro Vancouver Regional District Number of Active Vehicles per 1,000 Persons Findings

Table 7: Metro Vancouver Regional District Active Vehicles per 1,000 Persons

A screenshot of a calendar

Description automatically generated

Note: The above table reports the number of active vehicles per 1,000 persons up to the most recent year for which annual population data is available from Statistics Canada. As of October 2024, the most recent data available is up to 2023.[[4]](#footnote-5)

Figure : Metro Vancouver Regional District Active Vehicles per 1,000 Persons

A graph of blue bars

Description automatically generated with medium confidence

Analysis and Conclusions:

In Metro Vancouver Regional District, the number of active vehicles per 1,000 persons has steadily increased from 1.36 in January 2022 to 1.82 in January 2023. It continued to 2.76 in December 2023 (+1.40, or +102.94 per cent in two years). The growth stemmed from both TNS and taxi services, with TNS vehicles contributing more to such growth. TNS vehicles per 1,000 persons went up from 0.96 in January 2022 to 2.22 in December 2023 (+1.26, or +131.25 per cent), while taxi vehicles saw a smaller but still steady rise from 0.40 to 0.54 (+0.14, or +35 per cent) during the same time.

Overall, the rise in the number of active vehicles shows that passenger transportation services have become more available and accessible in Metro Vancouver Regional District. In general, increasing the number of active vehicles can contribute to higher accessibility in the area.

Limitations: The number of active vehicles per 1,000 persons does not address the Board’s other examples of accessibility, including accessibility for people with other disabilities or underserved groups and communities. In addition, it does not reflect the reduction in the barriers to inclusion.

## Affordability Factor (PN)

### Fare per Kilometre

Primary Factor: Affordability

Description: Fare per kilometre reflects the typical trip revenue that service providers earn per kilometre during a trip.

Measurement: Fare per kilometre is measured by the median (i.e., the 50th percentile) of the fare per kilometre distribution in an area over a month. As there is variation in fare per kilometre, the 10th and 90th percentiles of the fare per kilometre distribution are also reported.

Interpretation: Fare per kilometre serves as an indicator of the affordability of passenger transportation services. In general, a higher fare per kilometre indicates reduced affordability, as it suggests higher costs for passengers. Specifically, if the fare per kilometre increases more rapidly than B.C.’s average hourly wage rate, affordability would decrease as the rising costs outpace the passengers' ability to pay.[[5]](#footnote-6)

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the affordability factor, which are set out below alongside their corresponding implications on fare per kilometre:

* The proposed service provides more affordable options or services for consumers.
  + In general, lower fare per kilometre leads to improved affordability of service. On the other hand, the ratio of fare per kilometre to personal hourly wage rate can more accurately reflect affordability, with a lower ratio indicating better affordability.

#### Metro Vancouver Regional District Fare per Kilometre Findings

Table : Metro Vancouver Regional District Fare per Kilometre

A screenshot of a computer

Description automatically generated

Note: The above table only reports results when the underlying number of observations exceeds 50.

Figure : Metro Vancouver Regional District Taxi Fare per Kilometre

A graph showing the growth of a company

Description automatically generated with medium confidence

Figure : Metro Vancouver Regional District TNS Fare per Kilometre

A graph showing a line of a graph

Description automatically generated with medium confidence

Analysis and Conclusions:

Since October 2023, in Metro Vancouver Regional District the taxi meter rates for flag, distance, and wait time all have increased by 7.3 per cent.

In March 2024, the taxi median fare per kilometre in Metro Vancouver Regional District rose to $3.66, up from $3.28 (+$0.38, or +11.6 per cent) in March 2023, while the 10th percentile fare per kilometre increased to $2.56 (+$0.35, or +15.8 per cent) and the 90th percentile fare per kilometre increased to $6.65 (+$0.74, +12.5 per cent) during the same period.[[6]](#footnote-7) The 10th, median, and the 90th percentiles of fare per kilometre all observed an upward trend, suggesting that the average fare per kilometre has increased over time. Meanwhile, the higher increase in fare per kilometre compared to the meter rates increases was due to a higher number of trips with shorter distances.

Meanwhile, in March 2024, B.C.'s average hourly wage growth was 7.98 per cent year-over-year, which was similar to the increases in meter rates but lower than the increase in taxi fares per kilometre, as measured by the 10th, 50th, or 90th percentiles of the taxi fare distribution. The higher increases in taxi fare per kilometre suggests that wage growth has not kept pace with rising costs for taxi services, potentially affecting the affordability of these services.[[7]](#footnote-8)

In March 2024, the TNS median fare per kilometre in Metro Vancouver Regional District was $2.29, down from $2.67 in March 2023 (-$0.38, or -14.2 per cent), while the 10th percentile fare per kilometre decreased to $1.34 (-$0.24, or -15.2 per cent), and the 90th percentile fare per kilometre decreased to $4.80 (-$0.80, or -14.3 per cent) over twelve months. Compared to B.C.'s wage growth, the decreases in TNS fare per kilometre were observed across the 10th, 50th, and 90th percentiles of the TNS fare distribution, suggesting improved affordability of TNS services over time.

Overall, in Metro Vancouver Regional District, the affordability of taxi services did not significantly improve, while the affordability of TNS services showed improvement. In general, lower taxi flag rates and reduced meter increment rates for distance and waiting times would contribute to better affordability.

Limitations: While income may provide a more accurate measure of affordability than hourly wages, income data was only available up to 2022. In addition, fare per kilometre does not account for whether suppliers offer unique, innovative, or efficient services that could reduce costs.

### Fare Distribution for Typical Trips (Jun)

Primary Factor: Affordability

Description: Fare distribution for typical trips reflects the distribution of trip revenue that service providers earn during a trip with a typical distance.

Measurement: Two types of typical trips are studied: 2-kilometre trips and 5-kilometre trips. The fares of different percentiles for the two types of trips are calculated.

Interpretation: For a majority of regions, trips, whose distances are close to 2 kilometres, are the most frequent trips in most months. For some regions, the average distance of all trips approximates 5 kilometres in most months. For other regions, a majority of trips are shorter than 5 kilometres in most months. Hence, fare distributions for 2-kilometre and 5-kilometre trips can serve as indicators of the affordability of passenger transportation services. In general, a higher fare for the lower percentile indicates reduced affordability while a lower fare for the higher percentile indicates improved affordability.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the affordability factor, which are set out below alongside their corresponding implications on fare distribution for typical trips:

* The proposed service provides more affordable options or services for consumers.
  + In general, a lower fare for the higher percentile leads to improved affordability of service.

#### Metro Vancouver Regional District Fare Distribution for Typical Trips Findings

Table : Metro Vancouver Regional District Fare Distributions for 2-Kilometre Trips in March of 2022-2024

A screenshot of a graph

Description automatically generated

Note: The above table reports the different percentiles of fare distributions for 2-kilometre trips in March of 2022-2024, and each column corresponds to a percentile. The 100th percentiles (or the maximum fares) are not reported as they are unusually large and are outliers, which are sensitive to data errors. The 0th percentiles (or the minimum fares) are not reported as they are unusually small and are outliers, too, which are sensitive to data errors. The distribution is calculated only when the number of observations exceeds 50. In Metro Vancouver Regional District, taxi companies charge customers based on common rate rules, so fares for 2-kilometre trips should be constant and not reported.

Table : Metro Vancouver Regional District Fare Distributions for 5-Kilometre Trips in March of 2022-2024

A screenshot of a graph

Description automatically generated

Note: The above table reports the different percentiles of fare distribution for 5-kilometre trips in March of 2022-2024, and each column corresponds to a percentile. The 100th percentiles (or the maximum fares) are not reported as they are unusually large and are outliers, which are sensitive to data errors. The 0th percentiles (or the minimum fares) are not reported as they are unusually small and are outliers, too, which are sensitive to data errors. The distribution is calculated only when the number of observations exceeds 50. In Metro Vancouver Regional District, taxi companies charge customers based on common rate rules, so fares for 5-kilometre trips should be constant and not reported.

Analysis and Conclusions:

For 2-kilometre trips, there was a huge variation from the 5th percentile to the 98th percentile in March of each year. The 5th percentiles for 2022, 2023, and 2024 are $7.77, $8.53, and $6.70, respectively whereas the 98th percentiles for 2022, 2023, and 2024 are $18.67, $17.32, and $17.22, respectively, representing an increase of 140.3%, 103%, and 157%, respectively. Likewise, for 5-kilometre trips, there was a huge variation, too. The 5th percentiles for 2022, 2023, and 2024 are $11.39, $12.06, and $9.55, respectively whereas the 98th percentiles for 2022, 2023, and 2024 are $25.06, $23.14, and $22.03, respectively, representing an increase of 120%, 91.9%, and 130.7%, respectively.

These variations can be attributed to two factors: One, TNS services introduced dynamic pricing, and they charge higher when the demand is high and lower when the demand is low. This dynamic adjustment of prices in response to demand leads to variations in fares even if trips are the same length. Second, there are very few trips whose distances are exactly 2 or 5 kilometres in the Trip Database. To calculate the distribution of the fare for 2-kilometre and 5-kilometre trips, trips whose lengths are not exactly 2 kilometres or 5 kilometres have to be included. As such, trips whose distances are not longer than 2.3 kilometres and are not shorter than 1.7 kilometres are pooled together to calculate the distribution for the fares of 2-kilometre trips, and trips whose lengths are not longer than 5.5 kilometres and are not shorter than 4.5 kilometres are pooled together to calculate the distribution for the fares of 5-kilometre trips. Fares for those trips are divided by their respective lengths, which are fares per kilometre, and then multiplied by 2 or 5, yielding the distributions for 2-kilometre and 5-kilometre trips, respectively. This difference in fares per kilometre, due to differences in the flag rate and distance rate, also contributes to variations in fares.

For both types of trips, all percentiles’ fares in March 2024 were smaller than those in March 2023. For 2-kilometre trips, the largest decrease, 21.5%, happened at the 5th percentile while the smallest decrease, 0.6%, occurred at the 98th percentile, and the average decrease of all percentiles was 13.6%. For 5-kilometre trips, the largest decrease, 20.8%, happened at the 5th percentile while the smallest decrease, 4.8%, occurred at the 98th percentile, and the average decrease of all percentiles was 13.2%. In March 2024, B.C.’s average hourly wage growth was 7.98% year-over-year. The growth in wages and a simultaneous decrease in fares for 5-kilometre trips suggested improved affordability.[[8]](#footnote-9)

A pronounced trend for both types of trips is that the decreases in the lower percentiles are huge while there are minimal decreases in the higher percentiles, suggesting that peak demand outweighs the peak supply.

Overall, in Metro Vancouver Regional District, the affordability of TNS services, in general, showed improvement, but this improvement didn’t apply to all trips.

Limitations: Fare distribution for typical trips does not account for whether suppliers offer unique, innovative, or efficient services that could reduce costs.

## Safety Factor (PN)

There is no analysis related to this factor.

## Service Quality Factor (PN)

### Wait Time (Jun)

Primary Factor: Service Quality

Description: Wait time reflects the duration passengers wait for vehicles to arrive for pick up.

Measurement: Wait time for each trip is calculated as the difference between the pick-up arrival time and the hail time. Wait time is measured by the median (i.e., the 50th percentile) of the monthly wait time distribution in an area, and different percentiles of wait time distribution of the most recent month are also calculated.

Interpretation: Wait time serves as an indicator of the quality of passenger transportation services. It acts as a market-clearing variable, influenced by factors such as demand, supply, and the efficiency of the technology used to match passengers with vehicles. A longer wait time indicates reduced service quality, as it suggests longer delays for passengers.

The Board’s public need policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the service quality factor, which are set out below alongside their corresponding implications on wait times:

* The proposed service provides more or improved service where there is currently inadequate service.
  + A long wait time suggests an inadequate level of service supplied.
* The proposed service provides more reliable service.
  + A short wait time can suggest that the service is reliable.
* The proposed service encourages more efficient service to the public, including trip speed.
  + Wait time is part of trip time, so a short wait time contributes to an efficient service.
* The proposed service provides a service that is comfortable and convenient.
  + A short wait time contributes to a more comfortable and convenient service.
* The proposed service supports better customer service and customer satisfaction.
  + A short wait time contributes to better customer service and customer satisfaction.

#### Region 2 Wait Time Findings

Table : Region 2 Wait Times

A screenshot of a calendar

Description automatically generated

Table : Region 2 Wait Time Distribution in September of 2024

A screenshot of a graph

Description automatically generated

Note: The above table reports the different percentiles of wait time distribution and each column corresponds to a percentile. The 100th percentiles (or the maximum of wait times) are not reported as they are unusually large and are outliers, which are sensitive to data errors. The distribution is calculated only when the number of observations exceeds 50.

Figure : Region 2 Wait Times

A graph with a line and a line

Description automatically generated with medium confidence

Figure 7: Region 2 Wait Time Distribution

A graph of blue bars

Description automatically generated

Analysis and Conclusions:

In September 2024, Region 2 recorded a median taxi wait time of 5.3 minutes, a bit lower than its median taxi wait time in September 2023. Similarly, the median TNS wait time in the same area was 7.4 minutes, also a bit lower than its median wait time observed in September 2023. Meanwhile, the 95th percentile of wait time distribution for taxi service was 16.7 minutes, and the 95th percentile of wait time distribution for TNS service was 19.4 minutes. Overall, taxi and TNS wait times in Region 2 have been steady. In general, increases in the supply of vehicles without corresponding increases in demand tend to lead to shorter wait times, and hence better service quality.

Limitations: In calculating the median wait time, trips with unreasonably long wait times due to data errors were not included. The 100th percentile’s wait times are not reported as they are huge, which may be due to data errors.

## Competition Factor (SEC)

### Concentration Indices

Primary Factor: Competition

Description: Concentration indices measure the degree of lack of competition among service providers in an area over a month.

Measurement: Concentration can be measured by various indices, including the Herfindahl-Hirschman Index (HHI) and the Index. HHI sums the squares of the market shares of all firms in a market. Theil Index, on the other hand, first compares each firm's average relative to its group's average, and then each group’s average relative to the overall average. Compared to the HHI, Theil index provides an overall measure of market concentration, as well as a decomposition between within-sector concentration and between-sector concentration.

Interpretation: For both HHI and Theil indices, higher values indicate a lack of competition and the existence of entry barriers, while lower values indicate a higher level of competition. However, the linkages between the level of concentration indices and certain economic outcomes of interest (e.g., efficiency, reliability, improved service quality, and price competition) are yet to be established through longer-term research and monitoring.

For HHI, a value lower than 0.1 signifies an unconcentrated market; a value between 0.1 and 0.18 indicates moderate market concentration, and a value larger than 0.18 indicates high market concentration.[[9]](#footnote-10) For the Theil Index, there are no suggested thresholds for high values. Its primary application lies in decomposing concentration, distinguishing whether it arises from differences among companies or disparities between sectors.

The Board’s sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the competition factor, which are set out below alongside their corresponding implications on concentration indexes:

* The proposed service encourages healthy competition among various service providers.
  + When the concentration index value is at an appropriate level, it signifies that multiple service providers are competing effectively. However, determining the appropriate level can be challenging, as the relationship between concentration indices and economic outcomes of interest (e.g., efficiency, reliability, improved service quality, and price competition) in the context of B.C. is yet to be established.
* The proposed service provides a competitive option where only one type of service exists as long as it is economically feasible.
  + A market where only one type of service exists would have a high concentration index value, indicating that a single provider or a few providers dominate the market. The economic feasibility aspect, however, can be better assessed through other indicators, such as the sustainability factor indicators.
* The proposed service serves niche markets or underserved areas.
  + In niche markets, the concentration index will be high due to limited providers. The underserved markets aspect, however, could be better identified through other approaches, such as estimating unmet demand.

#### Metro Vancouver Regional District Concentration Indices Findings

Table : Metro Vancouver Regional District Herfindahl-Hirschman Concentration Index

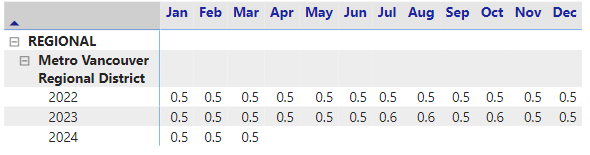


Figure : Metro Vancouver Regional District Theil Concentration Index

A graph of blue bars

Description automatically generated with medium confidence

Analysis and Conclusions:

In March 2024, HHI in Metro Vancouver Regional District was 0.5, consistent with its historical values since January 2022, which have ranged between 0.5 and 0.6. The HHI values in Metro Vancouver Regional District indicate that the degree of concentration in this region has been stable and high.

Meanwhile, Theil Index was 2.1 in March 2024, aligning with its values since January 2022, which have ranged between 2.0 and 2.4. The Theil index decomposition suggested that the degree of concentration in Metro Vancouver Regional District was largely driven by the larger market share of the TNS sector.

In general, increased competition is linked to certain economic outcomes, including efficiency, reliability, improved service quality, and price competition. However, their empirical relationships in the context of B.C. are yet to be established through long-term monitoring.

Limitations: The concentration indices alone do not provide a definitive measure of the appropriateness of the competition level, market sustainability, and unmet demand. Moreover, the extent to which increased competition, in the context of B.C., can lead to price competition, efficiency, improved service quality, and reliability is yet to be established.

## Innovation Factor (SEC)

There is no analysis related to this factor.

## Sustainability Factor (SEC)

### Revenue per Active Vehicle

Primary factor: Sustainability

Description: Revenue per active vehicle measures the amount of revenue generated by each vehicle that was in operation in a given area during the reporting period.

Measurement: Revenue per active vehicle is calculated as the median (50th percentile) of the revenue-per-active-vehicle distribution in an area over a month.

Interpretation: Higher revenue per active vehicle supports the industry's sustainability by ensuring each vehicle generates more gross income.

The Board’s sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the sustainability factor, which are set out below alongside their corresponding implications on revenue per active vehicle:

* The proposed service promotes long-term stability for the passenger transportation industry.
  + Assuming fixed costs, high and stable revenue per active vehicle implies high and stable profits, thus promoting long-term stability for the industry.
* The proposed service encourages resiliency in the passenger transportation industry.
  + Assuming fixed costs, high and stable revenue per active vehicle implies high and stable profits, thus encouraging industry resilience.
* The proposed service minimizes significant market disruption.
  + Assuming fixed costs, stable or gradually increasing revenue per active vehicle indicates no significant market disruption.
* The proposed service protects the taxi sector from rapid disruption to ensure its long-term stability as an essential service.
  + Assuming fixed costs, stable or gradually increasing revenue per active vehicle in the taxi sector indicates a lack of rapid disruption.
* The proposed service promotes overall profitability and economic sustainability of the industry.
  + Assuming fixed costs, stable or gradually increasing revenue per active vehicle in the taxi sector indicates overall profitability and economic sustainability for the industry.

#### Metro Vancouver Regional District Revenue per Active Vehicle Findings

Table : Metro Vancouver Regional District Revenue per Active Vehicle

A screenshot of a calendar

Description automatically generated

Figure : Metro Vancouver Regional District Revenue per Active Vehicle

A graph showing the growth of the company

Description automatically generated

Analysis and Conclusions:

In March 2024, the median monthly taxi revenue per active vehicle in Metro Vancouver Regional District was $4,432, a decrease of $278 (-5.90 per cent) on a year-over-year basis. Year-to-date to March 2024, the average median taxi revenue per active vehicle has declined to $4,066 from $4,490 in 2023. The decrease in average median taxi revenue per active vehicle suggested potential profitability challenges within the taxi sector, which may undermine the sector’s long-term sustainability if the decline continues.

In March 2024, the median monthly TNS revenue per active vehicle was $1,658, little changed from its value recorded in March 2023. Year-to-date to March 2024, the average median TNS revenue per active vehicle decreased slightly to $1,556 from $1,610.

Overall, the year-over-year decline in monthly taxi revenue per active vehicle indicated potential sustainability challenges for the taxi industry in Metro Vancouver Regional District if the downward trend continues. In general, an increase in available vehicles without a corresponding increase in demand can lead to a decrease in taxi revenue per vehicle, negatively impacting the taxi industry’s sustainability.

Limitations: The median (i.e., the 50th percentile) revenue per active vehicle cannot fully represent the sustainability of all active vehicles in a region in a month. Moreover, revenue per active vehicle does not address the Board’s other sustainability examples, including balance across different sectors, promotion of driver incomes and contribution to a stable supply of drivers in the taxi sector, environmental sustainability, reduction of greenhouse gas emissions, other pollutions, congestion, or reduction of harm to or enhancement of Public Transportation.

### Taxi Fleet Utilization Rate (updated Feb 5th, 2024)

Primary Factor: Sustainability

Description: Taxi fleet utilization rate represents the proportion of licensed vehicles that are active in an area over a month.

Measurement: The taxi fleet utilization rate is determined by dividing the number of average active vehicles by the total number of licensed vehicles in a given area during the reporting period. The number of average active vehicles is determined by data reported to the Trip Database, while the total number of licensed vehicles is the maximum fleet size approved by the Board.

Interpretation: A relatively stable taxi fleet utilization rate over time can indicate long-term stability for the taxi industry. On the other hand, a decline in utilization rates, other things being equal, suggests unsustainable economic conditions as licensees choose to operate fewer vehicles in their fleet.

The Board’s sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the sustainability factor, which are set out below alongside their corresponding implications on taxi fleet utilization rate:

* The proposed service promotes long-term stability for the passenger transportation industry.
  + Significant changes in the fleet utilization rate can be signal instability of the passenger transportation industry.
* The proposed service encourages resiliency in the passenger transportation industry.
  + A consistently close-to-full fleet utilization rate indicates the industry is at its supply capacity, and unable to meet further demand growth. A consistently low fleet utilization can indicate a lack of growth of the industry.
* The proposed service minimizes significant market disruption.
  + A significant change in the fleet utilization rate can signal market disruption.
* The proposed service protects the taxi sector from rapid disruption to ensure its long-term stability as an essential service.
  + Frequent spikes to close-to-full fleet utilization indicates the supply of the industry is unable to adapt to market disruptions.
* The proposed service promotes overall profitability and economic sustainability of the industry.
  + Close-to-full fleet utilization rates can indicate licencees are unable meet demand to maintain and grow their profit margin
  + A consistent reduction in the fleet utilization rate can indicate deteriorating profit margins.

#### Region 2 Taxi Fleet Utilization Rate Findings

Table 12: Region 2 Taxi Fleet Utilization Rate

A screenshot of a calendar

Description automatically generated

Figure : Region 2 Taxi Fleet Utilization Rate

A graph with a line going up

Description automatically generated

Analysis and Conclusions:

In September 2024, Region 2 recorded a taxi fleet utilization rate of 95.0 per cent, a 3.0 percentage point year-over-year decrease from September 2023. Year to date to September 2024, the fleet utilization rate was 95.2 per cent, a 0.8 percentage point decrease from the same period in 2023.

Overall, the taxi fleet utilization rate remained close to the whole fleet capacity at above 90.0 percent in Region 2, suggesting the fleet was well utilized to respond to the existing demand. The high and stable fleet utilization rate suggests a lower risk to the market’s sustainability in Region 2.

Limitations: The taxi fleet utilization rate does not provide insight into the equitability of opportunities in the industry, the impact on Public Transportation, the industry's sustainable profitability levels, or driver incomes, nor does it address the environmental aspects of sustainability.

### Taxi Vehicle Occupancy Rate

Primary Factor: Sustainability

Description: The taxi vehicle occupancy rate represents the proportion of working time during which a taxi carries passengers in an area over a month, reflecting the extent to which the market utilizes the supplied services.

Measurement: The taxi vehicle occupancy rate is calculated as the ratio of the total duration of all trips to the total working hours of all taxi vehicles in an area over a month.

Interpretation: A high taxi vehicle occupancy rate indicates frequent passenger occupancy, while a low taxi vehicle occupancy rate suggests that vehicles are often empty. A low taxi vehicle occupancy rate is unfavorable as it negatively impacts sustainable profitability. Additionally, significant changes in the taxi vehicle occupancy rate can signal shifts in market stability and potential sustainability challenges.

The Board’s sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the sustainability factor, which are set out below alongside their corresponding implications on the taxi vehicle occupancy rate:

* The proposed service promotes long-term stability for the passenger transportation industry.
  + Stability in the taxi vehicle occupancy rate can reflect long-term stability in the industry.
* The proposed service encourages resiliency in the passenger transportation industry.
  + Higher taxi vehicle occupancy rates can reflect higher resiliency levels in the passenger transportation industry.
* The proposed service minimizes significant market disruption.
  + Large shifts in the taxi vehicle occupancy rate can indicate a significant market disruption.
* The proposed service protects the taxi sector from rapid disruption to ensure its long-term stability as an essential service.
  + Large shifts in the taxi vehicle occupancy rate can indicate a rapid disruption, leading to challenges for long-term stability as an essential service.
* The proposed service promotes the overall profitability and economic sustainability of the industry.
  + A low taxi vehicle occupancy rate indicates unsustainable profitability and economic instability in the industry.
* The proposed service promotes adequate driver incomes to contribute to a stable supply of drivers.
  + A low taxi vehicle occupancy rate can signal inadequate driver incomes.

#### Metro Vancouver Regional District Taxi Vehicle Occupancy Rate Findings

Table 13: Metro Vancouver Regional District Taxi Vehicle Occupancy Rate

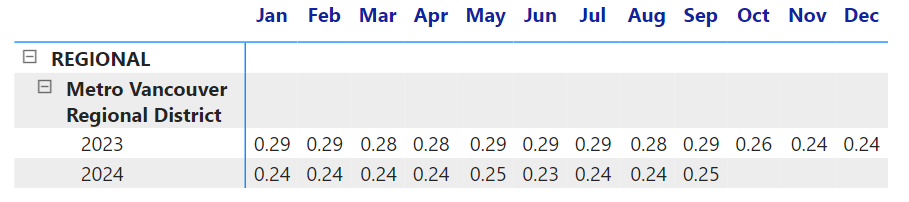


Figure : Metro Vancouver Regional District Taxi Vehicle Occupancy Rate

A graph with a line going up

Description automatically generated

Analysis and Conclusions:

In September 2024, the taxi vehicle occupancy rate in the Metro Vancouver Regional District was 0.25, a decrease from 0.29 in September 2023.. The YTD average in 2024 was around 0.24, approximately 5% decrease from 2023 YTD average. The decline of the YTD average in September 2024 suggests less profitability, as vehicles spent less working time carrying passengers. If the downward trend persists, lower taxi vehicle occupancy rates could pose profitability challenges to the sustainability of the taxi industry in this area.

Overall, the decline in the taxi vehicle occupancy rate to 0.25 in September 2024 indicates reduced profitability and potential sustainability challenges for the taxi industry in Metro Vancouver Regional District if the downward trend continues. In general, an increase in available vehicles without a corresponding increase in demand can lead to a decrease in taxi vehicle occupancy rate, negatively affecting the taxi industry's sustainability in the region.

Limitations: The vehicle occupancy rate illustrates the interaction between demand and supply and offers limited insight into the industry's sustainability. However, this indicator does not provide information about the Board’s other sustainability examples, including environmental impact and equity within the industry.

### Peak-Hour Taxi Vehicle Occupancy Rate

Primary Factor: Sustainability.

Description: The peak-hour taxi vehicle occupancy rate indicates the proportion of vehicle shifts with passengers during peak hours in a given area over a month, showing how much the market utilizes the supplied service during peak hours.

Measurement: The peak-hour taxi vehicle occupancy rate is calculated as the ratio of the total duration of all trips during peak hours to the combined working hours of all taxi vehicles during these peak hours in an area over a month.

Interpretation: A high peak-hour taxi vehicle occupancy rate indicates that passengers frequently utilize vehicles during peak hours. The peak-hour taxi vehicle occupancy rate is believed to be sensitive to changes, serving as an early indicator of trends, such as profitability challenges. When introducing a new service, its impact is more apparent during peak hours, allowing for prompt detection and response to changes.

The Board’s sound economic conditions policy in the [Policy Manual](https://www.ptboard.bc.ca/sites/default/files/2024-07/Passenger_Transportation_Board_Policy_Manual_v17.pdf) lists examples of the sustainability factor, which are set out below alongside their corresponding implications on the peak-hour taxi vehicle occupancy rate:

* The proposed service promotes long-term stability for the passenger transportation industry.
  + Stability in peak-hour taxi vehicle occupancy rate can reflect long-term stability in the industry.
* The proposed service encourages resiliency in the passenger transportation industry.
  + Higher peak-hour taxi vehicle occupancy rates can reflect higher resiliency levels in the passenger transportation industry.
* The proposed service minimizes significant market disruption.
  + Large decreases in the peak-hour taxi vehicle occupancy rate can reflect the significant market disruption.
* The proposed service protects the taxi sector from rapid disruption to ensure its long-term stability as an essential service.
  + Large decreases in the peak-hour taxi vehicle occupancy rate reflect a rapid disruption.
* The proposed service promotes the overall profitability and economic sustainability of the industry.
  + A low peak-hour taxi vehicle occupancy rate indicates unsustainable profitability and economic instability in the industry.
* The proposed service promotes adequate driver incomes to contribute to a stable supply of drivers.
  + A low peak-hour taxi vehicle occupancy rate can signal inadequate driver incomes.

#### Metro Vancouver Regional District Peak-Hour Taxi Vehicle Occupancy Rate Findings

Table : Metro Vancouver Regional District Peak-Hour Vehicle Occupancy Rate

A screenshot of a calendar

Description automatically generated

Figure : Metro Vancouver Regional District Peak-Hour Taxi Vehicle Occupancy Rate

A graph with a line

Description automatically generated

Analysis and Conclusions:

In March 2024, the peak-hour taxi vehicle occupancy rate in the Metro Vancouver Regional District was 0.28, a slight decrease from 0.31 in March 2023 and 0.30 in March 2022. This means that, on average, around one-third of the total hours of service provided by taxis during peak hours were being used. The annual average of the peak-hour taxi vehicle occupancy rate was around 0.32 in 2022 and 0.33 in 2023. However, in March 2024, the year-to-date average slightly decreased to 0.28. The decline in the year-to-date average in March 2024 suggests less profitability, as vehicles spent less of their working time carrying passengers during the peak hours when demand was highest. If this downward trend continues, lower peak-hour taxi vehicle occupancy rates can pose profitability challenges to the sustainability of the taxi sector in this area.

Overall, the recent decline in peak-hour taxi vehicle occupancy rates points to potential profitability challenges for Metro Vancouver Regional District's taxi sector if this downward trend continues. In general, increases in available vehicles without a corresponding rise in demand could decrease the peak-hour taxi vehicle occupancy rate, leading to sustainability challenges for the industry.

Limitations: The peak-hour vehicle occupancy rate illustrates the interaction between demand and supply during peak hours and indirectly offers insight into the industry's profitability. However, this indicator does not provide information about the Board’s other sustainability examples, including environmental impact and equity within the industry.

## Variety Factor (SEC)

There is no analysis related to this factor.

Signature:



Peter Po-Hsin Tseng, Ph.D.

Senior Economist

Passenger Transportation Board

## Appendix 1: Technical Methodology

A set of completed trips in a given area during the period is denoted by , and each completed trip is denoted by in is associated with a unique trip ID (one-to-one) and a unique vehicle ID denoted by (many to one). Indicators discussed in this report are calculated as follows. Unless otherwise mentioned, the underlying data is retrieved from the Trip Database.

### Demand Factor

#### Trip Volume

Trip volume is the total count of trip IDs of completed trips.

where counts the number of elements in the set.

#### Trip Revenue

Trip revenue is the total fare amount collected from all completed trips.

where is trip revenue and is the fare amount of the trip *.*

### Accessibility Factor

#### Number of Wheelchair Accessible Vehicles (WAVs)

Number of WAVs has two sub-metrics: (1) the number of active wheelchair accessible and (2) the number of active wheelchair accessible providing accessible trips.

The number of active wheelchair accessible vehicles is determined by identifying a set of unique vehicle IDs denoted by from completed trips in the Trip Database and cross-referencing them with a set of the registry of accessible vehicles denoted by .

where counts the number of elements in the set, and represents the set of active vehicles that are also registered as accessible.

The number of active wheelchair accessible vehicles providing acceptable trips is determined by limiting the list of active WAVs to those reported as having provided accessible trips.

where counts the number of elements in the set, and represents the set of active WAVs that are also providing accessible trips.

The number of active wheelchair accessible vehicles per 1,000 person is the ratio of to the area’s population denoted by , multiplied by 1,000.

The number of active wheelchair accessible vehicles providing accessible trips per 1,000 person is the ratio of to the area’s population denoted by , multiplied by 1,000.

#### Number of Active Vehicles per 1,000 Persons

The number of active vehicles per 1,000 persons is calculated as the ratio of total number of taxi and TNS active vehicles () to the area’s population (), multiplied by 1,000.

### Affordability Factor

#### Fare per Kilometre

For each trip , the fare per kilometre denoted by is calculated as the ratio of its fare denoted by to its trip length in kilometres denoted by .

The 10th, 50th, and the 90th percentiles of the fare per kilometre distribution are reported. Only trips recorded with a fare of at least $2.50 were included, in line with the minimum flag rate of $2.50.

### Safety Factor

There is no analysis related to this factor.

### Service Quality Factor

#### Wait Time

For each trip, wait time, denoted by , is defined as the difference between the pickup arrival time, denoted by and the hail time, denoted by , measured in minutes.

The median of the wait time distribution is reported. The median, when compared to the average, is less affected by outliers or extreme values, providing a more accurate representation of the central tendency (i.e., typical wait times). Pre-booked and street hail trips were excluded, as they were not the focus of what the wait time indicator is intended to capture.

### Competition Factor

#### Concentration Indices

Herfindahl-Hirschman Index (HHI) and Theil Index are both measures of market concentration.

The HHI index is calculated by summing the squares of each firm's market share, with lower values indicating more competition and higher values suggesting greater concentration.Specifically, the corresponding HHI Index for a given region is constructed as follows:

|  |  |  |
| --- | --- | --- |
|  |  |  |

where is the market share of firm in area during period , and is the total number of companies

The Theil Index is based on the concept of entropy from information theory. It measures the deviation of a distribution (like market shares) from a perfectly equal distribution. Specifically, the corresponding Theil Index for a given region is constructed as follows:

|  |  |  |
| --- | --- | --- |
|  |  |  |

where is the total number of companies, and represents the revenue share of the entity and is the average share.

The Theil decomposition is conducted as follows:

|  |  |  |
| --- | --- | --- |
|  |  |  |

where refers to the population size of the region, is the mean income of the region, and corresponds to the income of the entity in the region.[[10]](#footnote-11)

### Innovation Factor

There is no analysis related to this factor.

### Sustainability Factor

#### Revenue per Active Vehicle

Trip revenue per active vehicle is calculated by dividing the sum of the total fare amount by the total number of active vehicles:

where is total trip revenue, and is number of active vehicles.

#### Taxi Fleet Utilization

Taxi fleet utilization is calculated as the ratio of the total number of active taxi vehicles denoted by to the total number of approved taxi vehicles denoted by , multiplied by 100 to express it as a percentage.

#### Taxi Vehicle Occupancy Rate

Taxi Vehicle Occupancy Rate (VOR) is calculated as the ratio of the sum of all trip durations denoted by to the sum of all shift lengths denoted by .

The shift length is determined by the difference between the shift end time and the shift start time.

TNS trips are not included, as the start time for TNS shifts recorded in the Trip Database corresponds to the driver's first ride request rather than the actual beginning of their work shift.

#### Peak-Hour Taxi Vehicle Occupancy Rate

Peak Hour Taxi Vehicle Occupancy Rate is calculated by firstly identifying the peak hours, which are determined by examining the trip volume for each hour throughout the day.

The hour with the highest trip volume, relative to other hours, is designated as the peak hour. An example is shown below.

Figure 13: Identification of Peak Hours

A graph showing the different types of data

Description automatically generated with medium confidence

Once the peak hours are identified, the Peak-Hour Taxi Vehicle Occupancy Rate is then calculated by dividing the total trip duration during peak hours, denoted by , by the total working hours of all vehicles during the peak hours, denoted by .

### Variety Factor

There is no analysis related to this factor.

1. Year-over-year (YoY) compares March 2024 with March 2023, while year-to-date (YTD) compares the cumulative data from January to March 2024 with the same period in 2023. YoY evaluate specific monthly changes, while YTD assess trends over a recent period of time. [↑](#footnote-ref-2)
2. Statistics Canada. (2024). *Table 17-10-0152-01 Population estimates, July 1, by census division, 2021 boundaries* [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015201 [↑](#footnote-ref-3)
3. Statistics Canada. (2024). Table 17-10-0152-01 Population estimates, July 1, by census division, 2021 boundaries [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015201 [↑](#footnote-ref-4)
4. Statistics Canada. (2024). *Table 17-10-0152-01 Population estimates, July 1, by census division, 2021 boundaries* [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710015201 [↑](#footnote-ref-5)
5. Statistics Canada. (2024). *Table 14-10-0222-01 Employment, average hourly and weekly earnings (including overtime), and average weekly hours for the industrial aggregate excluding unclassified businesses, monthly, seasonally adjusted* [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410022201&pickMembers%5B0%5D=1.11&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2022&cubeTimeFrame.endMonth=07&cubeTimeFrame.endYear=2024&referencePeriods=20220101%2C20240701 [↑](#footnote-ref-6)
6. Note that in addition to the median fare per kilometre, the 10th and 90th percentiles are also observed and discussed as there is a huge variation of fare per kilometre. [↑](#footnote-ref-7)
7. Statistics Canada. (2024). *Table 14-10-0222-01 Employment, average hourly and weekly earnings (including overtime), and average weekly hours for the industrial aggregate excluding unclassified businesses, monthly, seasonally adjusted* [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410022201&pickMembers%5B0%5D=1.11&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2022&cubeTimeFrame.endMonth=07&cubeTimeFrame.endYear=2024&referencePeriods=20220101%2C20240701 [↑](#footnote-ref-8)
8. Statistics Canada. (2024). *Table 14-10-0222-01 Employment, average hourly and weekly earnings (including overtime), and average weekly hours for the industrial aggregate excluding unclassified businesses, monthly, seasonally adjusted* [Data table]. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410022201&pickMembers%5B0%5D=1.11&cubeTimeFrame.startMonth=01&cubeTimeFrame.startYear=2022&cubeTimeFrame.endMonth=07&cubeTimeFrame.endYear=2024&referencePeriods=20220101%2C20240701 [↑](#footnote-ref-9)
9. U.S. Department of Justice. (n.d.). *Herfindahl-Hirschman Index*. https://www.justice.gov/atr/herfindahl-hirschman-index [↑](#footnote-ref-10)
10. Novotný, J. (2007). On the measurement of regional inequality: Does spatial dimension of income inequality matter? *Annals of Regional Science*, 41(3), 563-580. https://web.natur.cuni.cz/~pepino/NOVOTNY2007AnnalsofRegionalScience.pdf [↑](#footnote-ref-11)