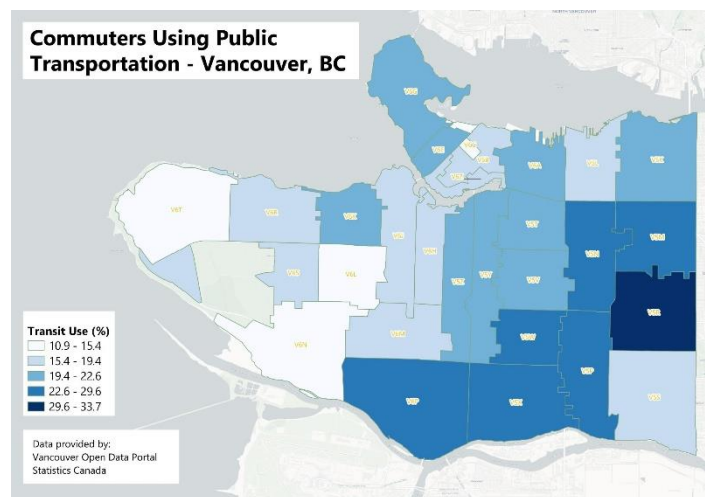


## Increasing Ridership: Quality of Transit

VANCOUVER, British Columbia — As the population of Vancouver grows, so does the problem of road congestion. In order to pave the way for the sustainable future that the city hopes to embody by 2040, looking towards alternative modes of transportation is imperative. Public transportation is the main contender – however, despite the many benefits of using public transportation, it appears that many Vancouverites perceive the quality of transit to be lacking. This presents a significant barrier towards ridership on public transit, emphasizing the need for insights and improvements into quality of transit in order to increase ridership. The City of Vancouver is at a critical juncture when it comes to transportation - without proper implementation of policies, the city will face major road congestion and transportation issues that prevent it from meeting its 2040 goals for a sustainable future.

Transportation is an essential aspect of our daily lives - it enables us to move around the city for work, school, or leisure, and is crucial for maintaining our overall quality of life. Without knowledge about the future plans and policies for transportation, people may consider relocating to other cities that offer more comfortable, sustainable, and safer transportation options. Therefore, it is crucial to improve the quality of transit system in Vancouver, in order to create a more sustainable future with a robust and thriving transit system.

One major dimension to ridership that can affect the quality of the transit system is a potential commuter's ability to access transit. Data on commuting patterns has been obtained from the Census conducted in 2021. Variance in transit use can be observed throughout Vancouver from one area to another (data on commutes has been obtained from the 2021 Canadian Census). The highest percentage of

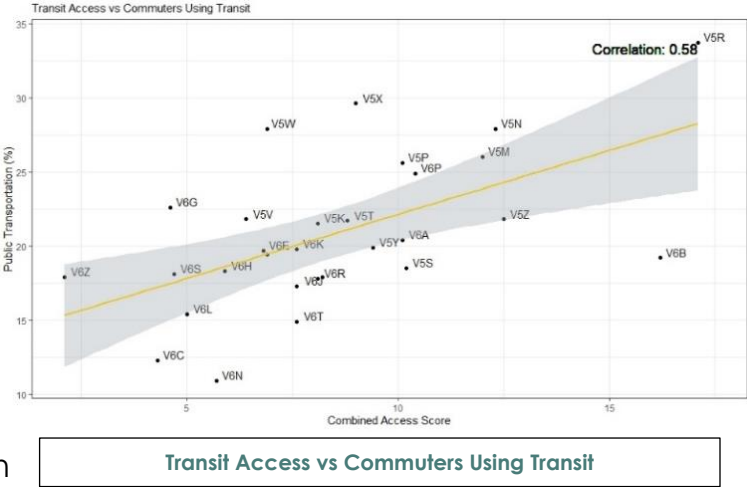


**There is a higher percentage of commuters using transit in the southern regions of the city (Census Canada, 2021).**

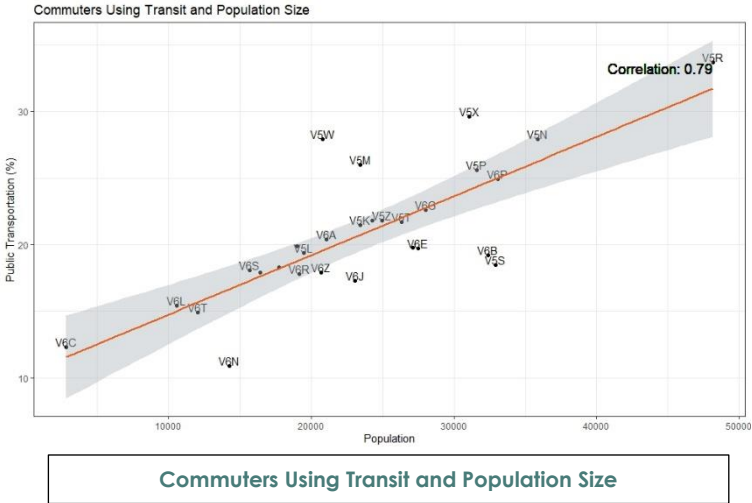
commuters using transit appear in the southern regions of the city, and the lowest appear in the more affluent West Vancouver region. Considering the reasons why regions are varied in use of transit helps to explain the story behind that variance.

### Visualizing Access to Transit

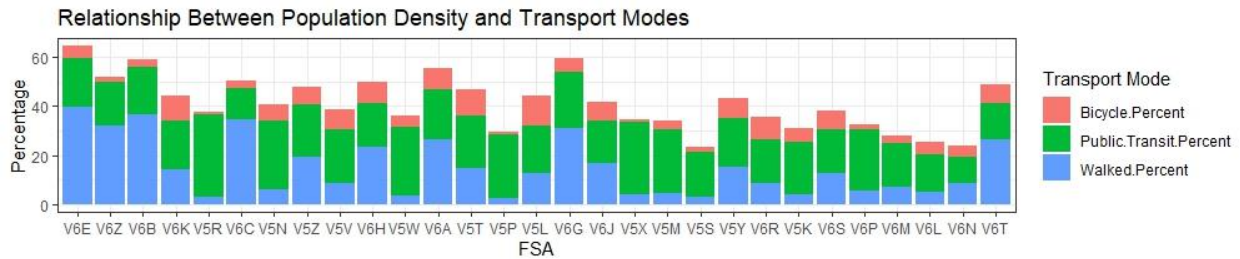
It stands to reason that this variance may be linked to access to transit infrastructure, as having a greater degree of access to public transit would make it a more attractive option for commuters. This is underscored by a positive correlation between access to transit infrastructure and the percentage of commuters using public transit, with a correlation score of 0.58. This means that a one unit increase in access to transit infrastructure is associated with a 0.58 unit increase in percentage of commuters using transit (this was determined by the FSA's Combined Access Score). Accessibility scores measure the accessibility of transit infrastructure based on the inventory of bus stops, skytrain stations, and rapid bus routes. This indicates that access to infrastructure plays a critical role in transit ridership; areas with greater access are more likely to have higher transit ridership, while areas with limited access may discourage residents from using public transit.



Population size is another key factor in transit use, with more populated areas generally showing higher rates of transit use. More populated areas (sorted by Forward Sortation Area) tend to have a higher frequency of transit use. As such, there is a positive correlation between the size of the population and the use of public transit; with a correlation score of 0.79. This suggests a region's population density



may be a greater determinant of transit use than accessibility. **Increasing population density in urban areas can encourage more people to use public transit** as those living in more populated areas might be incentivized to use public transit more in order to avoid road congestion and other traffic related problems.

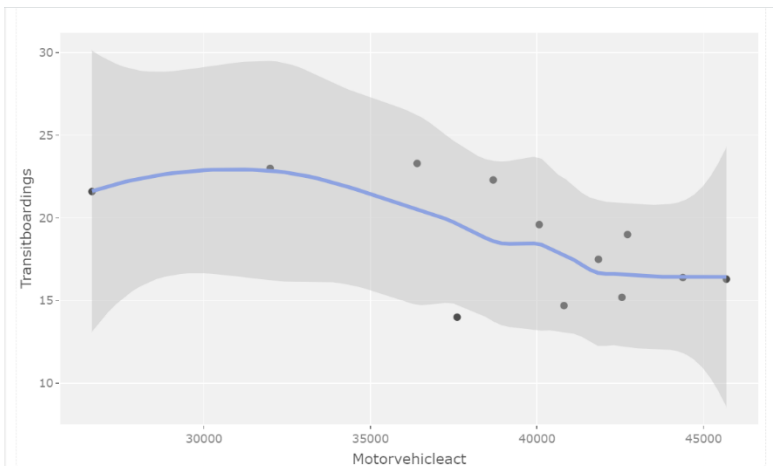


Public transportation is a widely used alternative mode of transportation.

When we examine the relationship between sustainable modes of transport and population density, we can see that the use of public transit is one of the most heavily utilized modes of transport in most areas (with a few exceptions). Those living in areas with higher population density have more to consider when commuting, as issues of road congestion and other traffic related issues are more prominent which may prompt people to use alternative modes of transport.

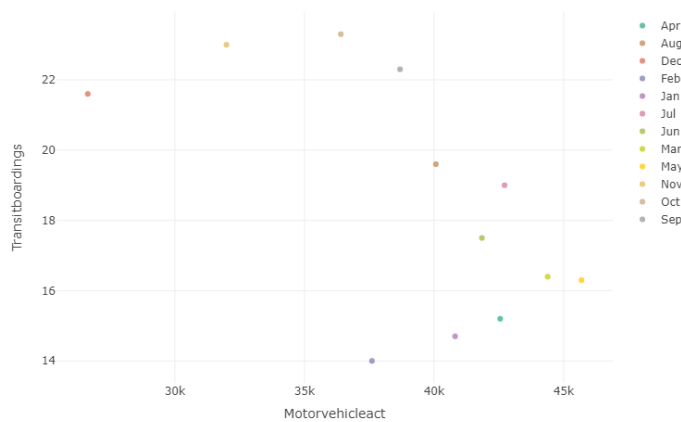
### Traffic Contraventions and Weather: Surprising Results

An issuance of a traffic contravention may be one such factor - talk about delaying your morning commute! Based on data, it seems that there is an inverse relationship between transit boardings and the issuance of motor vehicle act contraventions (traffic violation tickets). A higher amount of contraventions (data obtained from the ICBC in 2021) being issued is associated with lower transit boardings (data obtained from TransLink). It seems that despite the inconvenience of being issued a ticket, those that



An inverse relationship between transit boardings and a high rate of contraventions seem contrary to the predicted effect.

traditionally drive were not prompted to consider an alternative mode of transport. This suggests that improving the effectiveness of the police trafficking system may be needed in order to increase the use of public transit in the city, as people should be deterred from using their own vehicles after being issued a traffic contravention. Fines and tickets are a negative experience that can be an effective deterrent for those that engage in unsafe driving behaviours making the roads a safer and more attractive option. **It is important to consider ways to improve traffic enforcement system without discouraging people from using transit**, and emphasize the benefits of public transportation.



**February to July have the highest rate of contravention issuances and the lowest rate of transit boardings.**

Examining the relationship between transit boardings and the contraventions, we can also see that the months of February to July have the highest rate of contravention issuances and the lowest rate of transit boardings. While construction periods, school spring breaks, and longer days occur in this period, a major factor is increasing temperatures and the dawn of less desolate weather in

Vancouver. Perhaps the perpetual state of damp and dreary weather in the winter months beginning to slowly fade during this period offers a sense of renewal for many Vancouverites and may lead us to choose public transit over our vehicles. It is easy to see why individuals choose the comfort of their cars in the colder months - however, from the data we see that these months continue to experience high vehicle usage. Although the summer months are often viewed as an ideal time to promote the use of public transit due to the warmer weather and generally elevated spirits, the available data suggests that there are other factors that may impact people's willingness to use this mode of transportation.

### Safety: Concerns and Recommendations

One such factor is the issue of safety. The perception of safety is a significant factor in ridership. During the pandemic, use of transit dropped significantly. Despite these steep decreases in ridership, crime rates have not

seen an equivalent decline. In fact, crime rates have remained relatively high even with significantly fewer people using public transportation. This highlights the issue of safety and how it may be negatively influencing ridership. A survey done shows that a majority of Vancouver residents do not feel completely safe utilizing transit services, signaling that negative perceptions of transit safety are pervasive and pressing. **Two factors influence perception of safety: crime and lack of safety infrastructure.** Crimes against people and property present a serious safety issue as rates of crime steadily increasing throughout the city have created an unwelcoming and seedy environment that has extended onto public transit. As commuters embark on their morning commute, it is hard to shake a sense of unease from unsettling news on the surge in crime rates. These headlines make their appearance on your phone as you scroll and wait on the platform. Lack of security does not contribute to an environment where one feels secure on the platform. In combination with this, overhead lighting is sparse and makes it extremely difficult to clearly see your environment; dim yellow-tinted lighting that is found in most stations barely illuminates the station and creates an eerie look at night time adding to the ambience of exposure and lack of safety. It is important to address the inadequate safety infrastructure that is found in stations in order to gain a more positive perception of safety among transit passengers and potential commuters.

**Question 4: How safe do you feel using public transit?**

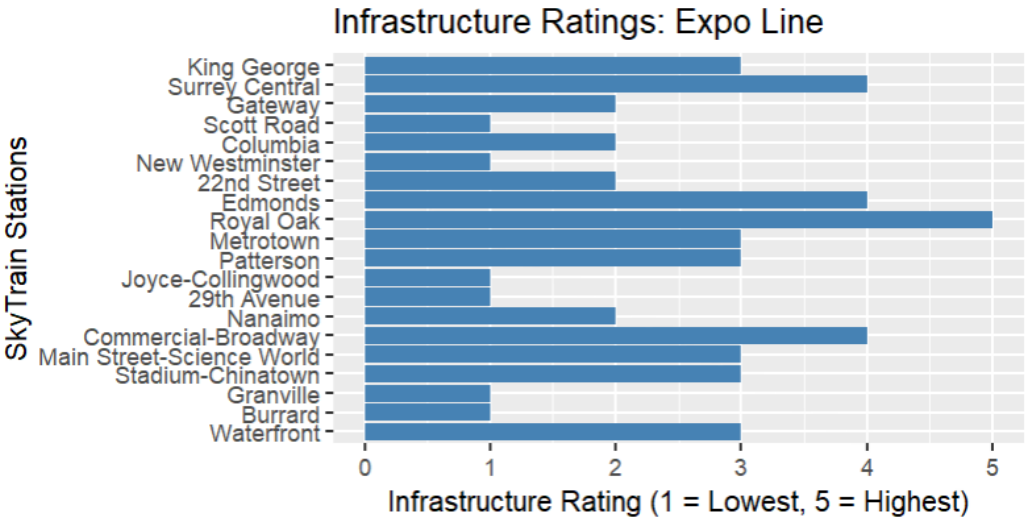
Degree of Safety	# of Participants (Total 164)	% of Total Participants
Very Safe (1)	10	6.10
Somewhat Safe (2)	110	67.07
Somewhat Unsafe (3)	40	24.39
Very Unsafe (4)	4	2.44

Likert Scale: 1 = Very Safe, 2 = Somewhat Safe, 3 = Somewhat Unsafe, 4 = Very Unsafe  
**Mean: 2.23**

**People have expressed that poor lighting and visibility are the most important security concerns when it comes to safety** (Blake, 2022). It is important to ensure that lighting and visibility infrastructure is adequate, and at least meets or exceeds the moderate criteria as listed in the table. Without being able to moderately meet the criteria standards, it is unsurprising that perceptions of

safety are so low. The lack of proper safety infrastructure at transit stations presents a serious issue; non-functioning surveillance cameras and a lack of security personnel create an environment that is conducive to criminal activity. The absence of security measures makes it easier for criminals to operate as it makes it much more difficult to stop and report crimes. In combination with the absence of proper lighting in areas within transit stations, this contributes to an environment where there is an increased likelihood of criminal activity and decreased overall sense of safety among passengers. This negatively affects ridership and poses a significant threat to the safety and well-being of passengers utilizing public transit.

**Skytrain stations in Vancouver are not scored highly based on their safety infrastructure.** Safety infrastructure scores were based on levels of lighting and visibility observed at stations, and the degree to which this infrastructure contributed to safety at a station. **Well-lit stations with good visibility are sparsely found along the Expo Line.** Security features were not up to moderate standard, keeping in line with low perception of safety and high crime rates.



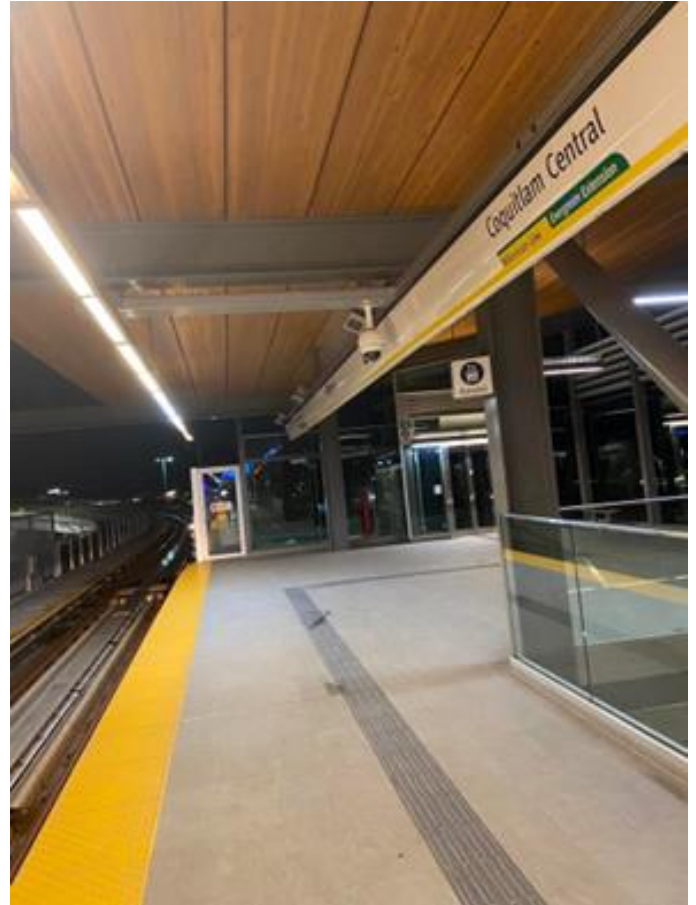


### Poor Camera Placement: Major Blind Spots

#### Station: Coquitlam Central

Due to poor placement of cameras and lack of functioning lighting on this platform as highlighted by the photo, there is a blind spot that is created. This is especially problematic when crimes or other threats to safety are occurring. The poor visibility in this specific location allows perpetrators of crime to take advantage of the lack of surveillance and cause harm to transit passengers.

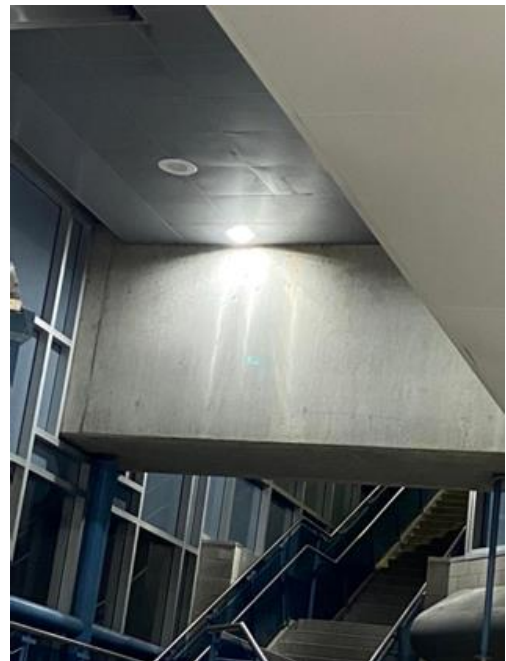
Blind spots are consistently observed throughout skytrain stations signalling a major weakness in transit safety infrastructure that needs to be addressed.



### Poor Visibility and Lighting: Creation of Unsafe and Vulnerable Areas

#### Station: Production Way/University

Poor visibility on the top of the staircase leading up to the platform caused by limited lighting makes it much harder to get security camera footage of this area and creates a perfect environment for crimes to occur such as harassment, theft, and assault. As well, this is a serious mobility concern as a lack of lighting prevents individuals from safely navigating the area - leading to more accidents.



## Poor Lighting: Negative Impact on Security Camera Footage

### Station: Lougheed Town Centre

Here is another instance of poor lighting observed at a major “hub” station. In this instance, non functioning lights on the station ceiling inhibit the ability of cameras on the ceiling to project visible security images/videos.

In order to reduce safety risks to passengers at the station, security cameras MUST be able to clearly capture live footage in order for TransLink police to respond quickly and effectively.

Observing this in a station highlights how many simple infrastructure modifications can be implemented in order to improve safety and allow transit stations to at least moderately meet the criteria for safety.



**Implementing relatively simple infrastructure modifications such as changing camera placement and installing functioning lights are crucial first steps** towards improving perceptions of safety among riders, which is a key factor that affects ridership levels. Well-lit stations with good visibility not only contribute to the safety of commuters during their commutes, but they also create a positive perception of the transit system. When stations are well-lit, passengers feel more secure and comfortable, especially when traveling at night or in low-light conditions. It creates a sense of safety and security that encourages passengers to use public transportation more frequently.



## Visualizing the Future

Public transit is a vital component of a sustainable future that uses greener alternative modes of transportation, but increasing ridership is a challenging objective that must take many factors into consideration. In Vancouver, low perceptions of safety, road trafficking issues, and accessibility to transit versus the distribution of population have all contributed to stagnating ridership rates. However, with the city's 2040 plans firmly committed to sustainability and green transport, it is crucial to explore the factors that are key components in the complex drivers of ridership. Reducing road congestion is crucial to mitigating the environmental impact of our daily activities, and public transportation should be an appealing alternative rather than a transportation mode that is considered a final resort. New policies that take these factors into account can transform public transit into a thriving system that improves the quality of life for many Vancouver residents by reducing road congestion and providing a safe and accessible way to move in Vancouver.

**Envisioning Vancouver in 2040, a robust transit system should be a cornerstone of the city's sustainable future. In this future, public transportation would be the preferred mode of travel for the majority of residents, reducing the reliance on private cars and reducing the environmental impact of our daily activities. While new and innovative technologies in the transportation sector offer exciting possibilities for future transportation networks, many policy changes can be implemented right now to bring about significant improvements in public transit and make a tangible difference in the lives of commuters. Public transit is an integral part of daily life and routine for many, and transportation itself is an issue for everyone as it provides the vital connections that keep a city running. We must remember the vital and interconnected role of transportation in the lives of people and the city in order to ensure a sustainable future for the City of Vancouver.**

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