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September 18, 2021

Michael McDaniel  
President and General Manager  
TransLink Head Office  
New Westminster, BC V3L 0E7

**Subject: Letter of Transmittal**

Dear Mr. McDaniel:

Here is my report, Assessment of Student Ridership Efficiency on Bus Route 49 to UBC. From this report, I discovered a lot behind the requirements of making the requirements to operate a systematic bus route that focuses on delivery of a service to customers. I believe my findings will contribute to other customers beyond students and will help translate to better company profits as well. Thank you for your commitment to customer service with the Coast Mountain Bus Company on behalf of TransLink.

The purpose of conducting analytical research in the realm of ridership efficiency seen on bus route 49 is a result of the critical circumstances of student health in which the schedule and timeliness heavily relies on the bus routes. Student concerns can be heavily reduced by looking at bus routes that could be a heavy contributor to the stress on student schedules.

This goal of the report aims to provide evidence as to how increasing bus route 49 efficiency times will ease student stress and bring further profits to the TransLink company. By increasing efficiency, it specifically allows students to be reassured that the commute time to campus will be achieved in a timely manner that can be reflected positively on behalf of the service of the company. It is a critical aspect to making sure students are not late for classes, exams, and important obligations. This successful implementation is critical to providing service to the many current and future students and the success of their education.

I appreciate the time and consideration many students and employees of TransLink have provided me during the research process of this report. There is a current issue with ridership efficiency that is important to current riders. I hope the recommendations will provide further improvements and success to the TransLink company seen through bus route 49 to UBC.

If you have any questions or concerns regarding this report, please do not hesitate to reach out via email at [jordan.zhao@ubc.ca](mailto:jordan.zhao@ubc.ca).

Sincerely,



Jordan Zhao

# **Assessment of Student Ridership Efficiency on the Bus Route 49 to UBC, as part of TransLink Metro Vancouver**

for

Mr. Michael McDaniel

President and General Manager

Coast Mountain Bus Company

TransLink Board of Directors

Senior Executive Team

By

Jordan Zhao

ENGL 301 Student

November 26, 2021

**TABLE OF CONTENTS**

Abstract.....III

Introduction.....1

    Background of Commuting Students of UBC.....1

    Overview of Problem and Purpose of Report.....2

    Scope of Research.....4

    Research Methods.....4

    Summary of Conclusions.....4

Data Section.....5

    Overview of Student Transportation Options to UBC Vancouver Campus.....5

    Student Survey Investigation of Access and Reliance on Bus Route 49 to UBC Vancouver.....5

    Investigations on the Importance of Bus Route 49 for Students of UBC.....7

    Review and Interpretation of TransLink Publicly Available Data on Boarding and Commute.....7

    Proposed Solutions.....9

        i. Review of Increasing Ridership Efficiency via Implementation of All-Door Boarding System.....9

        ii. Review of a Peak Hour Bus Frequency Increase.....9

        iii. Review of Running Re-Training Seminars for the Current Drivers of Bus Route 49.....10

Conclusion.....10

    Summary of Findings.....10

    Overview of Interpretation and Findings.....10

    Final Recommendations and Further Applications.....11

Works Cited.....12

Appendices.....13

    Student Ridership Survey Questions.....13

**Figures and Tables**

Table 1. Headcount by Student Level and Program Type (UBC Fact Sheet Winter 2020).....2

Table 2. Residence: Living On or Off Campus (UBC Fact Sheet Winter 2020).....2

Figure 1. Transportation Experience Via Bus Route 49 to UBC.....3

Figure 2. Survey Findings on Student Reliance of Bus Route 49 to UBC per week.....6

Figure 3. Survey Findings on Student Importance of Arriving to UBC on time of Bus Route 49.....6

Figure 4. Survey Findings on Students Frequency of Boarding Bus Route 49 to UBC.....7

Figure 5. TransLink Public Data for All Boardings per Month (TransLink Ridership Data).....7

Figure 6. TransLink Public Data Demonstrates the Majority of Ridership Boarding Coming from Bus Ridership (TransLink Ridership Data).....8

Figure 7. 99 B-Line Bus Route Boarding Quality Before and After Implementation of All-Door Boarding (City of Vancouver Administrative Report 2009).....8

## ABSTRACT

The assessment of student ridership efficiency on bus route 49 to UBC is based on the critical concerns of students that rely on timeliness of a schedule and how efficient certain processes are.

Improving student ridership efficiency on bus route 49 would improve the quality of life of students that heavily rely on the timeliness of their schedules being met. This consideration also holds to benefit the profits of the TransLink Coast Mountain Bus Company with increased ridership quality. Although there may be a cost from implementing solutions, these solutions are cost-effective and outweigh the long-term conditions that overlook all future students of UBC.

UBC students that commute via bus route 49 have reported that there is heavy reliance on this set bus route to campus and are negatively impacted from poor scheduling of bus times. Improved boarding efficiency and ride quality would reduce the stress that impacts student quality of life and improve success of students that have obligations requiring timeliness such as classes and exams.

To increase ridership efficiency on bus route 49 for UBC students, the TransLink company should follow these recommendations:

- Recognize bus route 49 as a major line for students of UBC
- Implement an all-door boarding system that mirrors bus route 99 and R4
- Consider a system that complements students during peak hours by implementation of increased bus frequency system
- Analyze the potential to offer re-training seminars to overlook current concerns and conditions of customer service provided by employees and bus drivers

## INTRODUCTION

### Background of Commuting Students of UBC

The Metro Vancouver Transportation Authority, TransLink, has been providing its services for many years through operations that include the subsidiary Coast Mountain Bus Company. Specifically, the Coast Mountain Bus Company provides a valuable service to students as a direct route to the University of British Columbia (UBC) and many other institutions along the way. UBC intakes roughly around 55,000 students each year for the past 5 years at all levels and program types as seen in Table 1. (UBC Fact Sheet Winter 2020). Approximately 45,000 live off campus where a good majority of students among this subgroup will take public transit to arrive on campus as seen in Table 2. (UBC Fact Sheet Winter 2020).

These numbers represent a big proportion of students that ride transit to campus and is a result of the U-Pass BC Program organized due to an agreement made between UBC and TransLink. The program is a subsidized transit pass program that provides post-secondary students with an affordable method of public transit across Metro Vancouver costing \$173.40 per academic term (U-Pass, AMS of UBC 2021). There are current restrictions around U-Pass exemptions which mostly pertain to concerns such as financial hardship subsidy, living outside of Metro Vancouver and taking only web-oriented courses, and the regular U-Pass exemption. As a result, many students end up having to pay for a U-Pass and leaves students relying on the services of TransLink in which they end up trying to use.

Headcount by Student Level and Program Type					
		2017	2018	2019	2020
Undergradua..	Baccalaureate Degree	36,657	37,231	37,858	39,462
	Post-Baccalaureate Degree	2,781	2,836	2,865	2,868
	Diploma	1,901	1,884	1,839	1,855
	Certificate	584	525	524	584
	Non-Degree	2,472	2,402	2,431	1,553
Graduate	Masters Degree	6,410	6,439	6,687	6,977
	Doctoral Degree	3,597	3,569	3,599	3,637
Resident	Residents	1,442	1,445	1,452	1,526
<b>Grand Total</b>		<b>55,844</b>	<b>56,331</b>	<b>57,255</b>	<b>58,462</b>

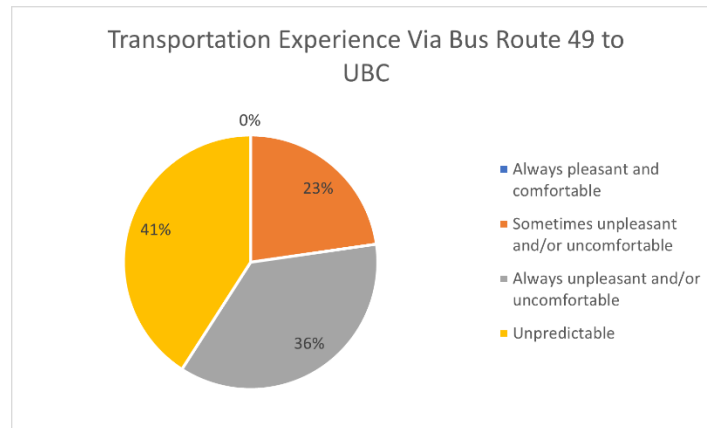
Table 1. Headcount by Student Level and Program Type (UBC Fact Sheet Winter 2020)

Residence: Living On or Off Campus					
		Session Year			
Program Type	Inhousing	2017	2018	2019	2020
Baccalaureate Degree	N	27,220	27,558	27,833	35,520
	Y	9,437	9,673	10,025	3,942
	<b>Total</b>	<b>36,657</b>	<b>37,231</b>	<b>37,858</b>	<b>39,462</b>
Masters Degree	N	5,882	5,871	6,056	6,538
	Y	528	568	631	439
	<b>Total</b>	<b>6,410</b>	<b>6,439</b>	<b>6,687</b>	<b>6,977</b>
Doctoral Degree	N	2,970	2,947	2,942	3,010
	Y	627	622	657	627
	<b>Total</b>	<b>3,597</b>	<b>3,569</b>	<b>3,599</b>	<b>3,637</b>

Table 2. Residence: Living On or Off Campus (UBC Fact Sheet Winter 2020)

### Overview of Problem and Purpose of Report

Figure 1. illustrates the transportation experience on the bus route 49. From the individuals surveyed, 41% indicated that the experience on this bus route was completely unpredictable, 36% indicated that it was always unpleasant and/or uncomfortable, 23% indicated that it was sometimes unpleasant and/or uncomfortable, and 0% indicated that it was always pleasant and comfortable. Students are currently having troubles with the quality of service provided by TransLink on bus route 49 which can be seen to be complicated by the increased wait times and boarding complications. With current COVID-19 complications, the inefficiency seen in the ridership quality is reduced and expected to continue indefinitely (Engagement, Government Communications and Public, and Ministry of Health. "British Columbia's Response to COVID-19."). In the case that students end up missing their bus, the number of riders waiting to board a bus gradually builds up.



**Figure 1.** Transportation Experience Via Bus Route 49 to UBC

Passengers are precautious with the current COVID-19 situation in ways where they try to avoid close contact with other passengers. This leaves riders hesitant in moving toward the back of the bus or in situations where they must stand close to other riders. This causes drivers to mistakenly believe that the bus is at full capacity and leads to waiting customers getting passed at bus stops. The following buses attempt to accommodate by trying to pick up these waiting passengers. As a result, this continues to leave passengers further down the route waiting for an indefinite period. This is a concern as many of the riders include students that rely on this bus route. They end up falling behind on their schedule and cause students to make negative remarks on the outlook of the company. Furthermore, these students may try to accommodate for these delays by having to depart earlier and evidently waste even more of their time than necessary.

These factors contribute to the continuous cycle of inefficiency seen in the ridership quality and is detrimental to the schedule of students. TransLink is the main provider for the transportation of students to the campus of UBC. By assessing the efficiency in the transport system for students of UBC, the overall travel accommodations can be drastically increased and reduce the level of stress for many students.

### **Scope of Research**

Given such constraints, students might consider planning and preparing extra travel time to arrive to campus on time. Allocating extra time may be a necessary expense of the requirements needed to go to university given the placement location of the campus.

UBC students concerned about arriving on campus need a better understanding to the current problems around travel times:

- How are other bus routes addressing the issues of providing efficient travel times for students commuting to UBC Vancouver Campus?
- What are the costs of implementing a solution such as all-door boarding that mirror other routes onto bus route 49?

### **Research Methods**

These questions will be answered based on a review of primary data collected via surveys and interviews, these findings will assess the issues around inefficiency and whether it is a significant problem that should result in improvements. These findings will be further paired with secondary sources that include literature review and publicly available data.

### **Summary of Conclusions**

This report demonstrates the importance of increasing ridership efficiency on bus route 49 to increase quality of life for many students of UBC. Other bus routes provided by TransLink such as the R4 and 99 bus routes already implement services that accommodate heavy student traffic. By recognizing the demands of the bus route 49, the timeliness of student schedules can be assured to be met by increasing efficiency of this route of transportation. Furthermore, a reasonable cost-effective solution



could be met and implemented which could inherently increase profits and ridership quality for the TransLink company as well.

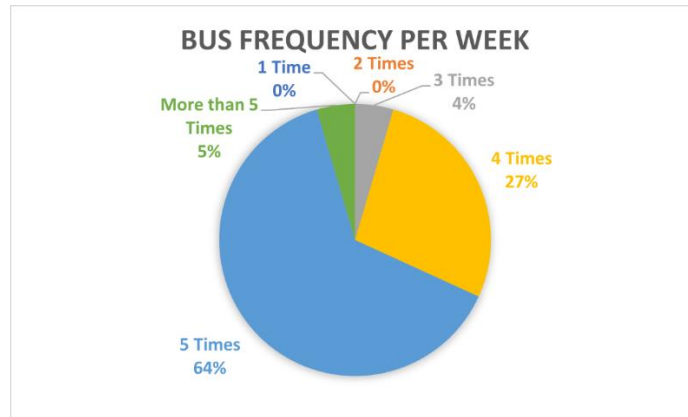
## **DATA SECTION**

### **Overview of Student Transportation Options to UBC Vancouver Campus**

There are currently 3 main lines that span a route from east to west direct to the UBC Vancouver Campus. These include the bus routes 99, R4, and 49. Each of these bus routes cover a general region at the start of their routes with the pickup zones being commercial Broadway, Joyce Collingwood, and Metrotown Burnaby respectively for routes 99, R4, and 49. Although bus route 49 is not a current express line, it has the potential to be efficiently improved in terms of ridership quality as it also serves as a major line for riders of South Vancouver and Richmond.

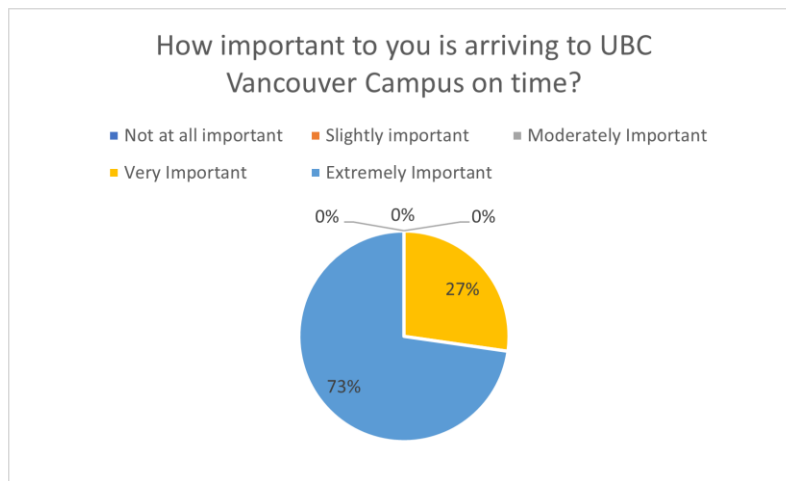
### **Student Survey Investigation of Access and Reliance on Bus Route 49 to UBC Vancouver**

With the implementation of the U-Pass BC Program, the subsidized cost of the provided transit pass program in a way ensures students maximize the use of the public transportation system provided by TransLink across Metro Vancouver (U-Pass, AMS of UBC 2021). This pooled financial effort among many other post-secondary institutions is the reason TransLink can provide a subsidized transit pass specifically for all post-secondary students (U-Pass, AMS of UBC 2021). By having all post-secondary students contribute to this program, it is a mandatory payment regardless of your method of transportation to class (U-Pass, AMS of UBC 2021). This as a result turns many individuals to the method of using public transportation to make use of this program that must be paid for as part of their tuition fees. As seen in Figure 2., 64% of respondents indicated the use of public transportation 5 times a week via bus route 49. 27% of the respondents indicated that they used public transportation 4 times a week via bus route 49. None of the respondents reported a bus frequency of only once a week or twice a week.



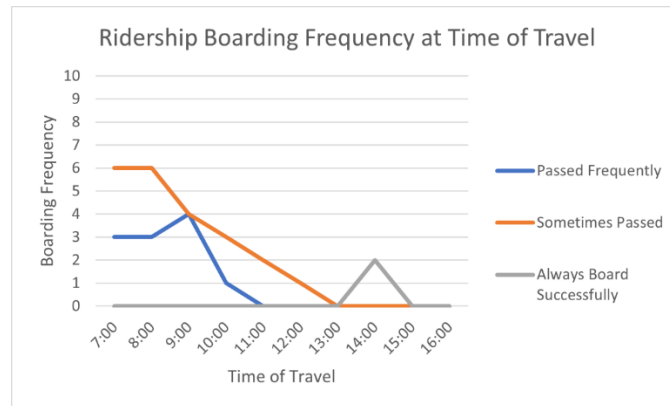
**Figure 2.** Survey Findings on Student Reliance of Bus Route 49 to UBC per week

Illustrated by Figure 3., 73% of respondents who took Bus Route 49 indicated that it was extremely important to them in terms of arriving to UBC on time. 27% of the respondents indicated that it was very important which was the minimum baseline measure of importance on arriving to campus on time.



**Figure 3.** Survey Findings on Student Importance of Arriving to UBC on time of Bus Route 49

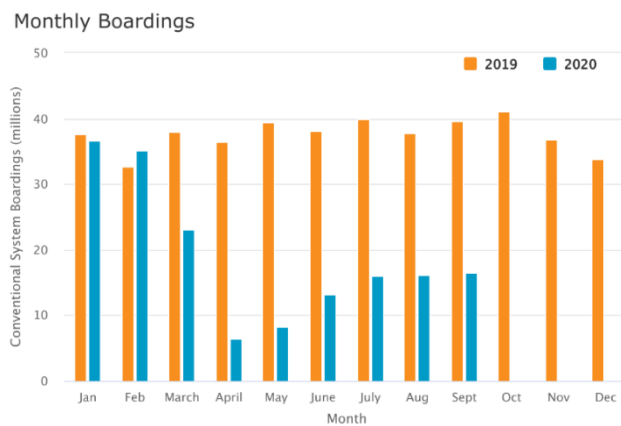
**Investigations on the Importance of Bus Route 49 for Students of UBC**



**Figure 4.** Survey Findings on Students Frequency of Boarding Bus Route 49 to UBC

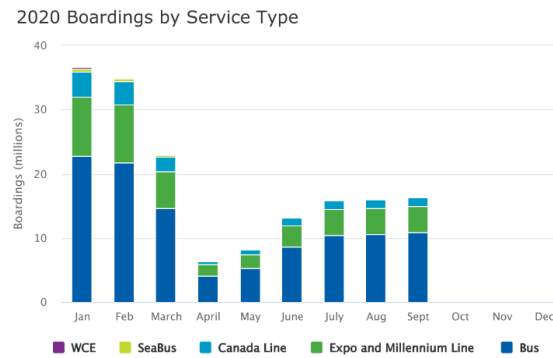
From Figure 4., findings indicated that most students commuting to UBC between 7:00 AM and 11:00 AM are frequently or occasionally passed by Bus Route 49. This indicates the heavy volume of riders seen making their way to campus in addition to all the potential riders that are non-students with obligations sharing this same route. The volume of riders being passed is drastically reduced as most students who board this bus route after 13:00 PM indicated that they always boarded successfully without any issues.

**Review and Interpretation of TransLink Publicly Available Data on Boarding and Commute**



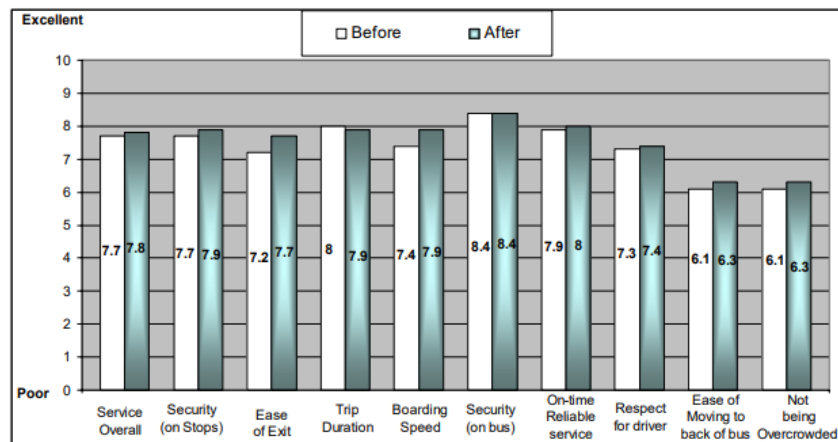
**Figure 5.** TransLink Public Data for All Boardings per Month (TransLink Ridership Data)

Figure 5. represents the complications that COVID-19 has resulted in the constraint of public transportation use in the year 2020. As the boardings slowly trend back up to normal boarding rates as seen in 2019, this will be problematic. As there are already boarding issues as demonstrated on the bus route 49, further ridership boarding will lead to greater inefficiencies.



**Figure 6.** TransLink Public Data Demonstrates the Majority of Ridership Boarding Coming from Bus Ridership (TransLink Ridership Data)

Furthermore, it has been determined that out of all the services, boarding via bus has been a major contribution to all efforts provided by TransLink and holds a huge customer base as seen in Figure 6.



**Figure 7.** 99 B-Line Bus Route Boarding Quality Before and After Implementation of All-Door Boarding (City of Vancouver Administrative Report 2009)

Lastly, the findings of Figure 7. indicate the benefits of implementing an all-door boarding system as seen in bus route 99. The findings support the potential benefits as seen in the improvement of overall service, boarding speed, ease of moving to the back of the bus and room for riders.

### **Proposed Solutions**

#### **i. Review of Increasing Ridership Efficiency via Implementation of All-Door Boarding System**

As apparent to the demands and services provided by the bus routes R4 and 99, they both run a direct line to the UBC Campus as well. By recognizing bus route 49 as another major line that runs direct to UBC, the implementation of an all-door boarding system that mirrors the R4 and 99 bus routes could be imposed. It has been indicated that most students that are the riders of bus route 49 are missing busses due to poor boarding conditions and complications. The use of all-door boarding allows students to ensure they are at least considered to board the bus despite the conditions the bus driver may have in mind.

This report proposes the use of an all-door boarding system which allows better access and boarding condition to students. One disadvantage may be the time needed to learn this implementation for all drivers of the bus route 49.

#### **ii. Review of a Peak Hour Bus Frequency Increase**

Implementation of a bus service that corresponds to the rush of students during peak hours in the morning may offset the riders per bus and correspondingly improve efficiency and boarding. It has been determined that majority of the issues around boarding, and ridership efficiency occur in flux of the large number of students attending UBC for early morning classes. By implementing a peak hour system that compensates for these large numbers, the ridership efficiency can be improved during these times. Furthermore, the system can return to normal after peak hours and follow the bus routes regular schedule of operation.

This option offers a solution that matches the number of student riders of bus route 49 in the morning and clearly results in more opportunities of boarding success, however, this would require a substantial increase of bus drivers to be re-distributed to this route for a portion of each day.

### **iii. Review of Running Re-Training Seminars for the Current Drivers of Bus Route 49**

Formal re-training of current bus drivers is another potential solution to the increasing efficiency. Regarding the interview with a fellow Coast Mountain Bus Company employee, it has been determined that bus ridership capacity is currently determined by the judgement of the active bus driver of the current bus. By holding seminars to quickly re-train all bus drivers, the solution can effectively impose a guideline on measures to account for to make better quality control decision on the capacity of the bus.

This option provides a foreseeable prevention in poor ridership efficiency among all bus lines and can allow better control of boarding on behalf of TransLink. However, with the current number of bus lines, the process of rotating bus drivers for a training seminar could potentially take a long duration of time until all drivers may receive formal re-training.

## **CONCLUSION**

### **Summary of Findings**

Students of UBC are among many other post-secondary students that rely on public transportation to their institution. It is crucial that students get to campus in a timely manner in order to ensure they can fully participate during class lectures without distractions and also ensure timeliness on arrival to exams.

### **Overview of Interpretation and Findings**

There is a large base of customers using bus as a mean of transportation, students being a large body of the customers. By improving the efficiency seen in bus routes, specifically bus route 49, TransLink can ensure better customer rapport and increase overall return on profits in the long term.

**Final Recommendations and Further Applications**

UBC Students heavily rely on the services of the bus route 49 to UBC and ensuring the timeliness of transportation is crucial the schedules of these students. To achieve improved ridership efficiency of students to UBC, consider the following recommendations:

1. Recognize bus route 49 as a major line to UBC Vancouver Campus and implement a system matches the number of riders.
2. Implement an all-door boarding system that offers a solution to the boarding quality seen on Bus route 49.
3. Integrate a peak hour travel system that increases bus frequency and offers further boarding opportunities during frequently accessed travel times.
4. Offer re-training seminars to employees of TransLink to provide further insight on the changes and considerations of students with respect to the current conditions.

### Works Cited

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## Appendices

### Student Ridership Survey Questions

I am an undergraduate student at UBC engaged in a technical writing project. The purpose of this survey is to obtain primary data for an analysis and investigation that aims to provide recommendations to improve your experience and increase ridership efficiency on public transportation Bus Route 49 to the UBC Vancouver Campus. The final formal report will be addressed to the TransLink Board of Directors, Senior Executive Team. Complemented by the publicly available data and reports from TransLink, the data collected from this research survey will serve the purpose of providing recommendations for improving ridership efficiency and quality. The survey contains 12 multiple-choice questions and should take about 5 minutes of your time. Your responses are voluntary and anonymous. Thank you, I appreciate your generous participation in my survey.

#### 1. How often do you take transit via Bus Route 49 to UBC Vancouver Campus?

- A) Once a week
- B) Twice a week
- C) Three times a week
- D) Four times a week
- E) Five times a week
- F) ore than five times a week

#### 2. What times of day do you take the bus route 49 to get to UBC Vancouver Campus? (select all that apply)

- A) 7:00
- B) 8:00
- C) 9:00
- D) 10:00
- E) 11:00
- F) 12:00
- G) 13:00
- H) 14:00
- I) 15:00
- J) 16:00
- K) Other (Please specify)

#### 3. Are you able to arrive to the UBC Vancouver Campus in a timely manner?

- A) No
- B) Yes
- C) Sometimes

#### 4. How important to you is arriving to UBC Vancouver Campus on time?

- A) Not at all important
- B) Slightly important
- C) Moderately important
- D) Very important
- E) Extremely important

**5. Boarding the Bus Route 49 to UBC Vancouver Campus is:**

- A) Easy and convenient
- B) Sometimes difficult and inconvenient
- C) Always difficult and inconvenient
- D) Unpredictable

**6. Boarding frequency via Bus Route 49 to UBC Vancouver Campus is:**

- A) Always board successfully
- B) Sometimes board successfully, sometimes passed
- C) Passed Frequently

**7. How often do you look up Bus Route 49 Arrival times to your stop for boarding?**

- A) Every time
- B) Sometimes
- C) Never

**8. If you look up Bus Route 49 Arrival times to your stop, how accurate is the arrival time?**

- A) Accurate
- B) Sometimes accurate
- C) Never accurate
- D) N/A

**9. How long does your commute via Bus Route 49 to UBC Vancouver Campus take from boarding to arriving at UBC?**

- A) 10 minutes
- B) 20 minutes
- C) 30 minutes
- D) 40 minutes
- E) 50 minutes
- F) 60 minutes
- G) Other (Please specify)

**10. How often do you plan ahead of your commute by preparing extra travel time?**

- A) Always
- B) Sometimes
- C) Never

**11. If you plan ahead by preparing extra travel time, how much extra travel do you prepare for?**

- A) 10 minutes
- B) 20 minutes
- C) 30 minutes
- D) 40 minutes
- E) 50 minutes
- F) 60 minutes
- G) Other (Please specify)
- H) N/A

**12. Transportation experience via Bus Route 49 to UBC Vancouver Campus is:**

- A) Always pleasant and comfortable
- B) Sometimes unpleasant and/or uncomfortable
- C) Always unpleasant and/or uncomfortable
- D) Unpredictable