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Main Report–July 2020

Employer Transit Subsidy Study

Final Report

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Simon Fraser University Employer Transit Subsidy Study

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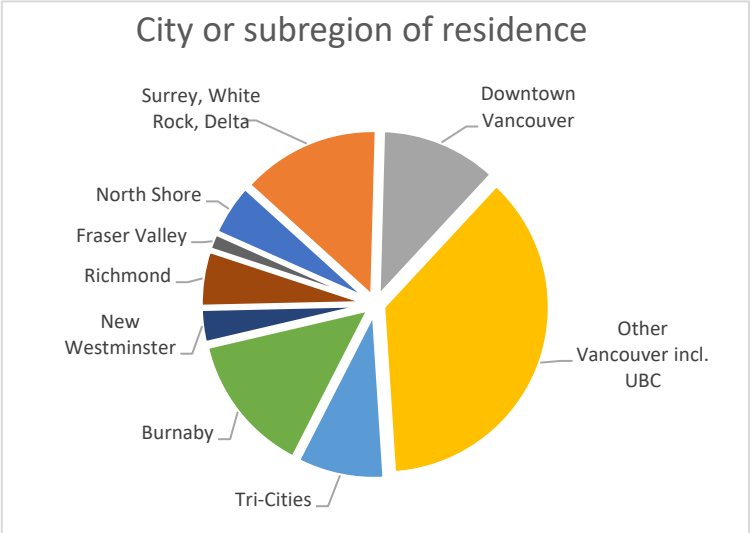
Executive summary

This study found that the larger the transit subsidy offered, the more employees were induced to become transit riders and the more transit-only commuting increased. The increase in transit-only commuting came from a reduction in auto-only and auto-and-transit commuting. Transit subsidy acceptance and effectiveness can be dampened by factors such as the availability of cheap parking, or greater distance between the workplace and rapid transit, leading to some variability in outcomes. Transit ridership and subsidy acceptance were associated with various positive self-reported improvements to workers' quality of life, including their health, stress levels and commute predictability. These positive quality of life outcomes were achieved without the transit subsidy having any observed effects on work schedules, turnover and performance.

Study background

The study was made possible by a partnership of the Simon Fraser University Urban Studies Program, the City of Vancouver, TransLink, Unite Here Local 40, the seven study hotels and the many individual hotel employees who participated in the study. This partnership provided a rare opportunity to conduct experimental research on the effects of varying levels of transit subsidy on the commuting behaviours of workers in the hotel industry. At four of seven participating hotels, the members of the Greater Vancouver Hotel Employers Association and Unite Here Local 40 had negotiated a 15% transit subsidy a few years before the study began. Both the union and management, as well as the city and TransLink, wanted to understand the effects of that subsidy on a variety of outcomes.

The study is important because workers in the tourism industry and hotels play an important role in Vancouver's city and regional economies. Hotel occupations encompass a full range of service sector jobs, including housekeeping, cleaning, food preparation and service, customer service, and management and administration. Although about half of workers at the study hotels lived in the City of Vancouver, on average hotel workers in the study had commutes of a longer duration than those reported by City of Vancouver and Metro Vancouver residents in the 2016 Census. A quarter of the hotel workers did not have regular shift start and end times, which could make it difficult to commit to a monthly transit pass.



Workers in other industries face similar commuting challenges to these, and we hope this study will support a focus on equity—making transit affordable and accessible to those who most depend on it—in the ongoing implementation and updating of the City of Vancouver's

transportation, land use and sustainability strategies, as well as to TransLink's efforts to expand and improve regional transit services.

Study goal and design

The goal of this study was to understand the impacts of employer-paid transit subsidies for downtown hotel workers in Vancouver, British Columbia. Specifically, we sought to understand how different levels of transit subsidy affected these workers' commuting patterns, mode choices, transit ridership and quality of life, as well as how the subsidies affected work schedules, turnover and performance at the seven participating hotels.

In designing the study, we grouped six of the hotels into three similarly located pairs, with the seventh, unpaired, hotel providing another point of comparison (see Table i). We conducted representative surveys of hotel workers at all seven hotels at three points in time. The baseline survey in March 2018 (Wave 1) was conducted before any experimental subsidies were offered. Our follow-up surveys, conducted in September 2018 (Wave 2) and March 2019 (Wave 3), examined what happened to workers' travel behaviour after the transit subsidy changes.[1] The response rate to the paper-based questionnaire used to conduct the surveys was more than 40% in each of the three waves. Table i summarizes the characteristics of each hotel and its subsidy levels over the course of the study.

Table i: Summary of hotel characteristics and subsidy treatment (Table 1 in main report)

Hotel	Relative size	Location relative to downtown SkyTrain stations	Comparable hotel(s)	Pre-study transit subsidy	Study treatment transit subsidy	
					May–Oct. 2018	Nov. 2018–Apr. 2019
A	Larger	Adjacent to SkyTrain	B	15%	25%	25%
B	Larger	Adjacent to SkyTrain	A	15%	None, stayed at 15%	None, stayed at 15%
C	Larger	West of SkyTrain, 5-min. walk	D, E	15%	None, stayed at 15%	None, stayed at 15%
D	Larger	West of SkyTrain, 15-min. walk	C, E	15%	25%	50%
E	Smaller	West of SkyTrain, 10-min. walk	C, D	None	15%	15%
F	Smaller	South of SkyTrain, 10-min. walk	G	None	25%	50%
G	Smaller	South of SkyTrain, 10-min. walk	F	None	None, stayed at 0%	None, stayed at 0%

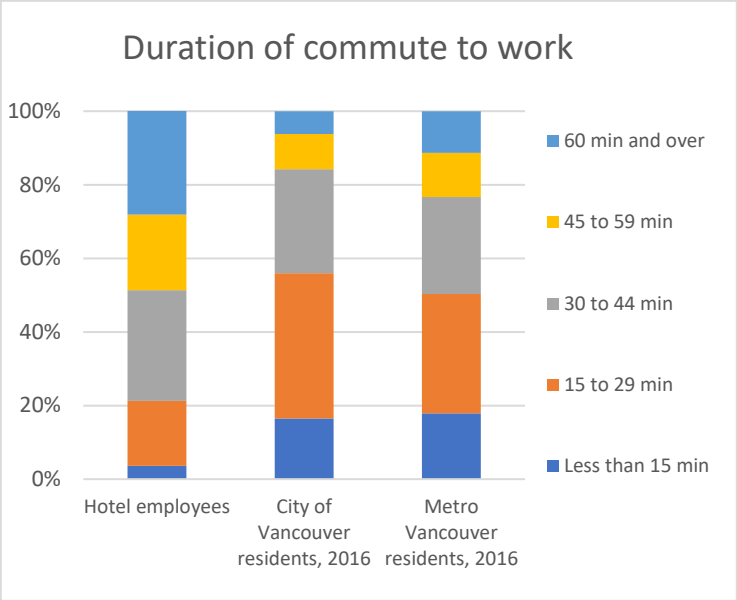
Note: the three shaded row pairs highlight comparable hotel pairs, as per the study design.

After we conducted the baseline survey, we offered workers at one hotel in each pair a new or enhanced subsidy, while leaving the subsidy level at the other hotel unchanged. For example, at the two hotels adjacent to a SkyTrain station, one (Hotel A) had a 15% transit subsidy before the study, and we increased it to 25% after the baseline survey. At the other hotel in this pair (Hotel B), we left the subsidy at a constant 15% throughout the study. To

[1] Data collection was unaffected by the Vancouver hotel strike of late 2019 and the COVID-19 pandemic.

gain insight into the impact of even higher transit subsidy levels, we further increased the subsidy to 50% at two hotels (hotels D and F) after the Wave 2 survey, while their paired hotels (hotels C and G respectively) remained unchanged.

We supplemented the survey data with organizational interviews, aggregated TransLink ridership data for Compass monthly pass holders from participants in the study, distance mapping, and a scan of parking availability and pricing. As this was an experimental study conducted in actual workplaces, we could not and did not attempt to control all the other factors that affect commute patterns, such as subsidy administration policies, employee parking policies and transit service levels. Instead, we have tried to describe and account for their influence throughout the analysis.



What we learned

Overall, the bigger the subsidy, the more uptake of transit. We found that the likelihood of a hotel worker changing from not using transit for any purpose to becoming a transit user between survey waves 1 and 3 increased by 4.4% with every percentage point increase in the subsidy level offered to them. This means that **increasing a transit subsidy by 23 percentage points doubles the chances that someone will become a transit user**, although the chances that any individual will make such a change in any given year are low. This finding accounts for demographic, residential and other factors that may influence transit usage, and is statistically significant at the 95% confidence level.

We estimate that where a new 15% transit subsidy became available, it induced between 4% and 10% of employees to become new transit commuters. Where a higher transit subsidy of 50% became available, we estimate that it induced more employees—between 9% and 14%—to become new transit commuters.

This means that **about one-quarter of those who accepted the new or enhanced transit subsidies were new transit riders**. This is a larger percentage than was found in a study by Rivers and Plumptre on the effects of the Canadian Public Transit Tax Credit, which was available from 2006 to 2017. They found that 3%–9% of those accepting the 15% tax credit were new transit riders.[2] A higher rate of conversion to public transit commuting was to be expected in our study because downtown Vancouver hotels are better served by transit

[2] Nicholas Rivers and Bora Plumptre, "The Effectiveness of Public Transit Tax Credits on Commuting Behaviour and the Environment: Evidence from Canada," *Case Studies on Transport Policy* 6, no. 4 (2018): 651–62, https://doi.org/10.1016/j.cstp.2018.08.004.

than almost all other parts of the country. Also, unlike tax benefits, which commuters had to wait up to a year to receive, the financial benefits of these employer transit subsidies were available to the hotel workers immediately.

This study clearly demonstrates the positive effect of transit subsidies on transit usage, but we also note that the relationship between commuting choices, transit subsidies and hotel employment is complicated. The size of the effect of the transit subsidy depended on a variety of factors, such as the location of the workplace relative to a rapid transit station. The effects of the transit subsidies were also subject to diminishing returns, and it is unlikely that even free transit will induce all commuters to take transit. Some will rely exclusively on active modes, such as walking or cycling, while those with cars who live in places poorly served by frequent transit, or who have multi-destination commutes, will drive. At the same time, transit use is associated with some degree of walking.

The effectiveness of transit subsidies is also mediated by factors such as the design and administration of the subsidy. Higher transit service levels, longer operating time span of transit service and higher parking prices all support transit commuting. Depending on how these factors combine, some workplaces will be more conducive to subsidy acceptance and transit commuting.

We expand on these observations as well as other key findings below.

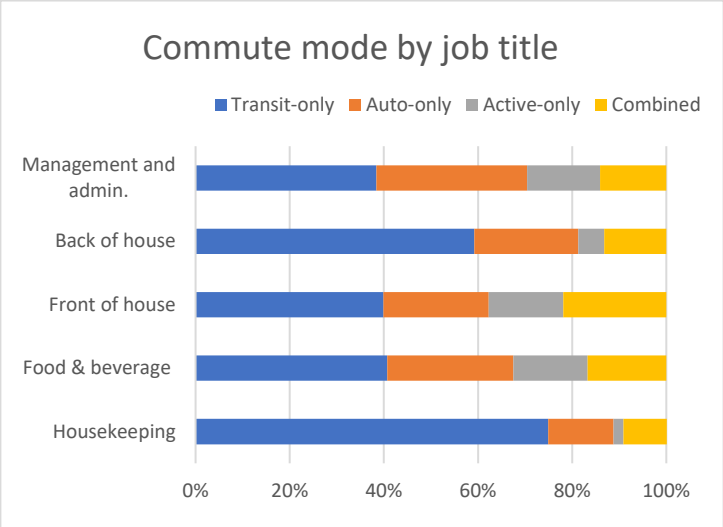
Our 12 key findings

1. **These hotel workers were highly engaged with the transit system.** At the time of the baseline (Wave 1) survey, over 90% of these hotel workers had a Compass Card, two-thirds had commutes that involved some transit and over half were transit-only commuters (transit-only commuting almost always includes some walking). These baseline conditions are important to bear in mind when interpreting the findings of this study. At the same time, workplace factors and proximity to transit at both place of residence and work play a significant role in shaping that engagement.

   Transit engagement: Refers to the behaviours that range from having a Compass Card, to including some transit in one's commute, to purchasing a monthly transit pass, to accepting a transit subsidy, to commuting only by transit.

   Housekeepers, who have work hours conducive to transit commuting and lower earnings than other groups of hotel workers, had the highest share of transit-only commuting at 75%. Only 38% of managers and administrators made transit-only commutes. Considerable differences in commute mode by hotel were also apparent. The hotel that was the farthest away from a SkyTrain station had a correspondingly low transit-only commute percentage (34%) and the highest percentage of auto-only commuters (48%), despite the availability of a 15% transit subsidy.

These baseline findings underscore the importance of transit to hotel workers, and likely also to other tourism and service workers, in the metropolitan core. Transit usage among these hotel workers was high before the study introduced new and enhanced transit subsidies.



2. **Some workers remained unaware of the transit subsidies throughout the study period.** The goal of the study was to understand the implications of a transit subsidy under real-life conditions, including the possibility that some workers might be unaware of those subsidies. For this reason, our survey teams avoided informing employees that a subsidy existed during the baseline survey (Wave 1).

   We found that even after the enhanced or new subsidies were announced at the six hotels that offered a subsidy during the study, between 12% and 54% of the respondents at those hotels still stated that their employer did not offer a subsidy. It's true that not all employees were eligible for the subsidy at these hotels—for example, new employees may have been ineligible for a certain time period after their start of employment—but this does not account for such a low level of awareness. One implication of this finding is that employees' transit engagement could be even higher if employers and unions, with the assistance of transit authorities, were able to increase communication about the subsidies.

3. **As the level of the transit subsidy increased, subsidy acceptance increased overall and was also higher among specific groups of workers.** Through our multivariate analysis, we found that an increase of one percentage point in the subsidy level increased the likelihood of someone changing to accept the subsidy by 3.5%. This means that increasing the dollar value of a transit subsidy by 10 percentage points will increase the chances that someone will adopt the subsidy by about a third. This finding is statistically significant at the 99% level, meaning that we are very confident in our finding that a higher subsidy level increases the likelihood that a subsidy will be accepted.

   The specific groups of hotel workers that were more likely to accept the subsidy had regular shift start and end times, lived farther from downtown or were immigrants. The equity-enhancing benefits of the transit subsidy are further indicated by the fact that those living in households with children and those who are renters were more likely to accept the subsidy.

4. **Eligibility, together with financial and administrative barriers, prevented some workers who were regular transit users from accessing and accepting the subsidy.** In Wave 2, 32% of respondents reported that they had accepted the transit subsidy, but a considerably larger percentage—62%—indicated that they had some type of monthly pass product. This gap between those who already had some type of monthly pass product and those who accepted the subsidy suggests that subsidy uptake, and hence transit use, could be increased by modifying eligibility, qualification and enrolment rules.

   One such barrier to subsidy acceptance could be the one-year qualifying period for the subsidy that existed at the hotels at the time of the baseline survey (March 2018). Starting a new job often entails creating new work-related routines. It's more likely that transit commuting would be one of those new routines if the subsidy were available from the start of employment or after a short probationary period. After a full year, new commuting routines and changes made in response to a new job are likely to be well established.

   Another factor affecting subsidy acceptance is how easily employees are allowed to join or leave the transit subsidy program. Allowing employees to join on a monthly basis instead of having to commit to a longer period of enrolment may increase subsidy acceptance. Allowing employees to sign up for a subsidized monthly pass for fewer zones than required by their fare zone of residence (as was the practice at some, but not all, of the hotels) would further reduce barriers to acceptance.

5. **Transit commuting increased overall, and it increased more at the hotels where the experimental transit subsidies were available than at the hotels where they weren't.** We found that overall, transit-only commuting increased by 2% over the study period. This is a significant increase given the high baseline level of transit commuting among the study population. Table ii presents the change in mode share for all employees. It shows that the share of transit-only and walk-only commuting increased, and that the share of auto-only and auto-and-transit commuting decreased from Wave 1 to Wave 3.

   Further, transit-only commuting increased more at hotels where the experimental subsidies were available. Looking at only those respondents who participated in both waves 1 and 3 of the survey (see Table 66 in the main report), we found:
   - An increase of 4.2% in transit-only commuting at the hotel where the subsidy increased from 15% to 25% versus an increase of only 2.2% at the paired hotel where the subsidy stayed at 15%.
   - An increase of 3.0% in transit-only commuting at the hotel where the subsidy increased from 15% to 50% versus a 1.6% decrease in transit-only commuting at the paired hotel where the subsidy stayed at 15%.
   - An increase of 2.9% in transit-only commuting at the hotel where a new subsidy of 50% was introduced versus a 7.1% decrease in transit-only commuting at the paired hotel where there was no subsidy.

   For unknown reasons, the share of transit-only commuting decreased by 3.1% at the one unpaired hotel in the study where we offered a new 15% transit subsidy.

Table ii: Summary of main commute mode percentage changes by hotel, waves 1 to 3 (Table 22 in main report)

		Change from Wave 1 to Wave 3 in (selected) main commute mode			
Hotel	**Subsidy treatment**	**Transit-only %**	**Walk-only %**	**Auto-only %**	**Auto and transit %**
A	**15% to 25%, then constant**	7.2	−2.3	−2.2	−2.0
B	**15%, no change**	0.7	1.4	−0.8	−1.3
C	**15%, no change**	−10.6	5.0	6.9	1.0
D	**15% to 25%, then 50%**	8.0	1.5	−5.8	−4.3
E	**New 15%**	−1.7	−2.0	3.3	−2.0
F	**New 25%, then to 50%**	2.2	1.1	−4.8	2.6
G	**0%, no change**	1.1	1.4	−2.8	0.6
All		1.8	1.0	−0.9	−1.5

Note: the three shaded row pairs highlight comparable hotel pairs. Hotel E was not paired.

6. **Specific subgroups of workers were more likely to commute by transit and were more likely to change their commute with the subsidy.** The following types of workers were more likely to commute either partly or completely by transit: workers at hotels adjacent to SkyTrain stations; housekeepers; those with no stops on their commutes for shopping, drop-offs or other purposes; and those not born in Canada. Residents of TransLink's fare Zone 2 were more likely to commute by transit than those living in either Zone 1 or Zone 3.[3] Zone 1 and 2 residents are well served by transit, but Zone 2 residents are more likely to have commutes involving transit than those in Zone 1, some of whom live close enough to work to use active commute modes. Zone 3 commuters live farther from their downtown workplaces and in many cases, have longer distances from their homes to the SkyTrain or to places where frequent bus service is available. This make them less likely to use transit as part of their commute.

   We found that the following subgroups were more likely to switch from some other mode to transit-only commuting between waves 1 and 3:
   - residents of Richmond, Burnaby and the Tri-Cities,
   - workers who started in their jobs more recently,
   - visible minorities, and
   - housekeepers, food and beverage workers, and front of house workers.

7. **Perceived inconvenience of transit relative to auto and active transport modes was a major barrier to subsidy acceptance and to switching to transit commuting.** In survey waves 2 and 3 we asked respondents who declined an available subsidy why they made that choice. In Wave 2, 11% stated (without prompting) that transit was inconvenient and 8% stated that the transit schedule

[3] The City of Vancouver comprises Zone 1. The inner suburban municipalities to the south, north and west of the city comprise Zone 2. The outer suburban municipalities farther to the east and south of the city comprise Zone 3. The fare for a journey depends on the mode and on the zone boundaries crossed. All journeys by bus are priced as one-zone fares. Journeys by rapid transit (SkyTrain and SeaBus) start as one-zone fares and increase each time a zone boundary is crossed. All transit travel is a one-zone fare after 6:30 p.m. on weekdays and on weekends and holidays.

did not work for them. Twenty-five percent stated that they drove, and 9% stated that they walked or cycled. None who gave this response were transit-only commuters. These reasons for not accepting the subsidy remained the same in Wave 3. Since these respondents didn't cite the subsidy level or terms as reasons for not accepting an available subsidy, we don't believe changes to the subsidy level or terms (alone) will be effective in encouraging these respondents to accept a transit subsidy and switch to transit commuting.

8. **Those who were unlikely to shift commute modes in response to a transit subsidy had specific characteristics.** Our analysis showed that the likelihood of having a commute that involved transit decreased for those who lived downtown, those who had a driver's licence or access to an automobile, and those who had a longer transit commute or one that required more transfers. It makes sense that those who live close to work (such as downtown residents) and are able to walk or cycle there would prefer using active modes to taking transit, which costs more, may take the same or more time, and is less flexible than active modes. Similarly, the longer and less convenient a commute is, the greater the time savings offered by auto commuting, especially when the worker is already qualified to drive or has access to an auto.

   One implication of this observation is that transit subsidies are subject to decreasing returns, since within any given community, there are some commuters—whether auto or active—who will not be induced to take transit regardless of price level. Based on our analysis, we estimate that if everything else stayed the same, no more than three-quarters of downtown Vancouver hotel workers would be willing to take transit to work, whatever the subsidy level. With 67% of all commutes in the study already involving transit, this suggests that the pre-existing subsidies had been effective at shifting transit commuting close to its likely upper limit. The experimental subsidies offered as part of the study were effective in moving transit commuting closer to that upper limit, even starting from a high baseline.

   Transit learner: Someone who, in accepting a transit subsidy and a monthly pass, becomes open to experimenting with new and additional ways of using transit.

   Cost-effective transit rider: Someone who already knows the transit system well enough to use their monthly pass to reach the break-even point.

   Break-even point: The point when the subsidized cost of a monthly pass plus any added fares purchased or incurred is less than or equal to the cost of the same journeys based on stored-value fare rates.

9. **Many new subsidy accepters were transit learners who used transit less intensively and somewhat less cost-effectively than existing transit users.** We found some evidence that the new subsidy accepters were less likely to break even on the cost of their monthly pass than existing subsidy accepters. This suggests that the new subsidy accepters were transit learners—that is, they were still working out how to use the transit system optimally and might in time use transit more. This type of transit user contrasts with a cost-effective transit rider, which is someone

who already knows the transit system well enough to reach the break-even point on their monthly pass.

This finding lends support to the idea of providing subsidies as a way of expanding transit mode share through behaviour change, with the caution that it will take time for the full benefits to manifest. The implication is that there is a ramp-up period for new subsidy accepters. During this time, it is important to provide information about the transit system and how to get the most benefit from it.

10. **Lower parking prices were associated with more auto commuting.** Monthly parking was considerably cheaper in the area around one of the seven hotels. At an average cost per space of $100.64 per month, parking near Hotel D cost less than half what it cost around comparable hotels. This hotel also had the largest percentage of auto-only commuters at the outset of the study. Complicating this finding is the fact that this hotel was also furthest from a SkyTrain station. Nevertheless, we did find that a larger subsidy was required to decrease the percentage of auto-only commuters than at other hotels. In the Wave 3 survey, 30% of respondents at that hotel gave "driving" as the reason why they didn't accept the subsidy, or as a comment. This was more than twice the rate at the hotel with the next highest rate of "driving" reasons or comments. Employers may therefore wish to consider promoting more efficient use of any parking space they own or control, through, for example, providing carpooling information and incentives.

11. **Those who used transit or accepted the subsidy were more likely to report improvements in quality of life, including in their physical health, level of stress and commute predictability, in contrast with overall reports of small declines in quality of life.** Transit users, as well as the subset of those who were subsidy accepters, reported improvements in their physical health, stress levels and commute predictability. For example, among those respondents matched from waves 1 to 3, we found that 47% of those who added transit to their commutes reported reductions in their stress levels. While we may expect reported stress levels to go up and down randomly among any group of people over time, 47% is substantially higher than the 30% of those who did not add transit to their commutes and who reported reductions in their stress levels.

12. **TransLink's Compass for Organizations program was easy to implement for employers, which supported their participation in the program.** Once a month, participating employers send TransLink a list of the Compass Cards belonging to their employees that should be loaded with a monthly pass product. TransLink then invoices the employers for these passes, and they in turn deduct the cost (minus any subsidy) from the pay of participating employees. All employers in the study had to sign up for the Compass for Organizations (CFO) program to distribute the experimental transit subsidies, and they consistently reported favourably on the program. When a system like TransLink's CFO program is in place, it's easier for employers to provide transit subsidies because it adds only a small administrative load.

Conclusion

Overall, this study provides evidence that employer-paid transit subsidies result in a range of important benefits to participating employees and their employers, as well as to local governments, transit authorities and the surrounding region. Employer-paid transit subsidies promote equity and improve livability as well as providing various benefits to those employers and participating employees.

When effectively administered and provided at a level that offers sufficient financial incentive, employer-paid transit subsidies increase transit ridership and transit-only commuting, at the expense of auto commuting. When fewer employees drive to work, their employers have an opportunity to convert parking spaces for single-occupancy vehicles to other uses, including those that generate revenue.

Further, transit subsidies make commuting by transit more affordable for the employees who accept the subsidy. When those employees have low incomes and are part of various socially disadvantaged groups, this enhances equity. Decreasing financial stress in turn improves the quality of life for the employees who accept the subsidy.

Transit subsidies benefit transit authorities and the region more generally by helping to maintain and increase ridership levels. In the case of hotel workers, many commute on the weekends and at off-peak times, so this increased ridership is likely to be accommodated without stretching the capacity of existing transit infrastructure and routes. Transit subsidies also indirectly benefit drivers by reducing the number of drivers on the road, which may reduce congestion at peak times.

Hotel employee work and commute patterns:

One-quarter have no regular shift start or end time.

Half work both weekdays and weekends.

Two-fifths commute before 6 a.m. or after 9 p.m.

In the case of employer-paid transit subsidies, all these benefits are achieved without the need for financial contribution from governments. This is because the subsidies are paid for by re-allocating a portion of total employee compensation toward those employees who accept the transit subsidies.

Origins and significance of this study

This is a study on the effects of transit subsidies that asks, *How do transit subsidies change transit ridership among downtown Vancouver hotel workers?* The study measured the effect of different levels of transit subsidy on levels and patterns of transit use, mode choice, commuting patterns, quality of life, and workplace organization and performance.

While multiple studies have looked at the effects of transit subsidies on commuting, it is relatively rare to find studies on the topic that devote attention to, much less focus on, how occupational and demographic factors affect the response to a transit subsidy. Hence our study is unusual in multiple ways, including that it not only specifies the occupation and sector of the workers receiving the subsidies, but also delves into how the commuting patterns of specific demographic and equity-seeking groups within this sector may differ from overall patterns.

Further, in looking at the commuting choices and patterns of hospitality workers, we have varied from the assumed "office worker" norm of the downtown workforce. Our study population consisted of workers at seven hotels in downtown Vancouver, the majority of whom belonged to Unite Here Local 40. Unionized hotel workers generally benefit from better pay and more job security than their non-unionized counterparts, but they are still part of a workforce that's subject to daily, weekly, monthly and seasonal fluctuations in customer demands for in-person service. They also work in the part of the region best served by transit. While many hotel workers have predictable schedules that resemble those of office workers, some do not. These conditions considerably complicate the commuting requirements and options for this set of workers.

While most transit subsidy studies deal with US or European jurisdictions and treat commuting decisions in isolation from those about housing, we have positioned this study in the geographic and social context of Metro Vancouver. This post-industrial urban region is a tourist mecca with relatively well-developed public transit infrastructure. It is internationally known for its beauty and "livability" as well as for its high housing costs, its high inequality, and, to a lesser degree, its congested roads. The lack of affordable housing in Metro Vancouver has intensified commuting complications and challenges. In some cases, hotel workers have had to move farther away from their jobs in downtown Vancouver in search of affordability, only to be faced with higher commuting costs and a mismatch between the 24-7 demands of their industry and the limited service hours of public transit.

Finally, this research has offered a rare opportunity to study the effects of varying levels of transit subsidy on the same population. To the best of our knowledge, this is the only study to investigate the effects of varying levels of transit subsidy on the commuting choices of hospitality-sector workers in a region with high housing costs. We believe it will be a valuable contribution to the literatures on transit subsidies and on equity in transit planning.

The fact that this study came to be owes much to the hospitality workers themselves, specifically to the housekeepers, front desk clerks, cooks, banquet servers and other hotel employees who belong to Unite Here Local 40 and who brought their transportation and housing challenges to the attention of their union. The generous cooperation of our other partners in this research—the management of the study hotels, as well as City of Vancouver and TransLink staff—has also been essential to this study.

One of the ways that Unite Here Local 40 has responded to its members' transportation and housing challenges is by negotiating with hotel management for a 15% subsidy on monthly transit passes to be included as a part of their members' benefits package at four of the seven hotels in this study. In 2015, the members of the Greater Vancouver Hotel Employers Association agreed through the collective bargaining process to provide that subsidy. Once the subsidy had taken effect, Unite Here Local 40 approached the City of Vancouver, as well as hotel management, about conducting a study on the effects of the subsidy. Recognizing the tourism industry's central role in the region's economy as well as an opportunity to enhance the equity and social dimensions of the city's *Greenest City 2020 Action Plan*, *Transportation 2040* and *Healthy City* strategies, then city councillor Geoff Meggs worked with the union and the hotel industry to request, from Simon Fraser University's Urban Studies Program, a rigorous, arm's-length study that would shed light on the relationships, if any, between transit subsidies and the commuting choices of this group of workers.

While one of the original goals of this study was to help inform an equity approach to the City of Vancouver's *Greenest City 2020 Action Plan*, *Transportation 2040* and *Healthy City* strategies, this research is equally relevant to more recently developed policy goals and strategies. At the City of Vancouver, these include council's January 2019 endorsement of the "All on Board" campaign, which calls for a sliding scale monthly transit pass system for low-income people.[4] Further, in April 2019, City Council approved a Climate Emergency Response report that calls for two-thirds of trips within Vancouver to be by transit or active transport modes by 2030, as well as for the formation of a climate and equity working group.[5] We also hope our findings can also contribute to the development of the "comprehensive citywide night-time economy strategy" that council directed staff to begin developing in June 2019.[6] Dovetailing with this, our data and findings will be relevant to the implementation of recommendations flowing from TransLink's June 2019 report on late-night service.[7]

The main body of this report is organized around 12 key findings, which are preceded by an overview of the study design and a detailed description of Vancouver's downtown hotel

[4] City of Vancouver, "Minutes, Standing Committee of Council on City Finance and Services" (Vancouver, BC: City of Vancouver, January 16, 2019), https://council.vancouver.ca/20190116/documents/cfsc20190116min.pdf, 15.

[5] City of Vancouver, "Minutes, Standing Committee of Council on City Finance and Services" (Vancouver, BC: City of Vancouver, January 16, 2019), https://council.vancouver.ca/20190116/documents/cfsc20190116min.pdf; and City of Vancouver, "Climate Emergency Report" (Vancouver, BC: City of Vancouver, April 16, 2019), https://council.vancouver.ca/20190424/documents/cfsc1.pdf, 1–2.

[6] City of Vancouver, "Minutes for the Standing Committee of Council on City Finance and Services" (City of Vancouver, June 26, 2019), https://council.vancouver.ca/20190626/documents/cfsc20190626min.pdf, 14.

[7] TransLink, "Late Night Service Report" (New Westminster, BC: TransLink, June 2019), https://www.translink.ca/-/media/Documents/about_translink/media/2019/2019-Late-Night-Service-Report.pdf.

workers. Readers who are interested in more details can find these in the 11 appendices. These include the following information:

- Appendix A: a review of relevant scholarly literature, which establishes the unique contribution of this study.
- Appendix B: more details on our hypotheses.
- Appendix C: more details on our methodologies.
- Appendix D: questionnaires from all three survey waves.
- Appendix E: analysis of a quasi-panel of respondents who participated in more than one survey wave, allowing comparison over time of a constant group of individuals.
- Appendix F: further enriching multivariate analysis of the factors associated with commute behaviours.
- Appendix G: analysis of anonymized aggregated data on travel behaviour obtained under agreement with TransLink.
- Appendices H, I and J: other supplementary data including mapping, parking and hotel-specific contextual data.
- Appendix K: a full set of frequency tables and selected cross-tabulations for data collected in waves 1, 2 and 3 of the survey.

Study design and data sources

This was an experimental study designed to observe and understand what happens when new or enhanced transit subsidies are offered to downtown hotel workers. We grouped six of the hotels into three similarly located pairs, with the seventh, unpaired, hotel providing another point of comparison. We conducted three waves of a survey at all seven hotels, using a paper questionnaire: in March 2018 before the experimental subsidies were announced, in September 2018 and in March 2019. After the March 2018 baseline survey, we offered workers at one hotel in each pair a new or enhanced subsidy, while leaving the subsidy level at the other hotel unchanged. To gain insight into the impact of even higher transit subsidy levels, we further increased the subsidy at two hotels after the September 2018 survey, while the subsidy at their paired hotels remained unchanged. We are able to identify what difference the transit subsidy made by comparing how commuting and other behaviour changed in each pair of hotels.

While the responses to the surveys of individual hotel workers are the foundation of this study, we have five other important supplementary data sources:

- organizational interviews with hotel management and union representatives,
- human resource indicators reported to us by hotel managers,
- aggregated ridership data for Compass Cards provided by TransLink,
- mapping the accessibility to frequent transit, as well as road distance and transit time, between workers' residential locations and the downtown core, and
- a study of parking availability and pricing in the areas surrounding the hotels.

We have used this supplementary data to contextualize and compare with the survey data.

The rest of this section provides more detail on each of the key elements of the study design and characteristics of the study hotels, with further detail available in Appendix C.

About the participating hotels

Practical considerations were foremost in our selection of the participating hotels. To make sure that each pair of hotels was comparable, we restricted ourselves to hotels whose workers belonged to Unite Here Local 40. We also chose hotels that were willing to give us access to their premises to survey their workers and to provide us with some basic information on their operations that would allow us to contextualize our results and findings. Administration of the experimental subsidies required that hotels participate in TransLink's Compass for Organizations (CFO) payroll deduction program. In addition to the easy implementation of the CFO, a data-licensing agreement with TransLink allowed us to analyze aggregated data on the travel behaviour of some groups of subsidy accepters.

Within these parameters, we sought to recruit hotels that could be assigned into pairs that had similar distance to public transit and pre-study availability of the transit subsidy, so that we could more easily isolate and observe the effects of the experimental subsidies. Those pairs were as follows:

- a pair of hotels that already offered the monthly transit subsidy, located adjacent to downtown SkyTrain stations,

- a pair of hotels that already offered the monthly transit subsidy and were a short walk to the west of the nearest SkyTrain stations,
- a pair of hotels that didn't offer the monthly transit subsidy, located to the south of downtown SkyTrain stations.

The seventh participating hotel (E, see Table 1) did not offer a monthly transit subsidy at the outset of the study. It was in a location that provided a good point of comparison with the second pair of hotels (C and D) that offered a monthly transit subsidy before the start of the study. Those hotels that we are able to name are listed on page ii.

Table 1: Summary of hotel characteristics and subsidy treatment

Hotel	Relative size	Location relative to downtown SkyTrain stations	Comparable hotel(s)	Pre-study transit subsidy	Study treatment transit subsidy	
					May–Oct. 2018	Nov. 2018–Apr. 2019
A	Larger	Adjacent to SkyTrain	B	15%	25%	25%
B	Larger	Adjacent to SkyTrain	A	15%	None, stayed at 15%	None, stayed at 15%
C	Larger	West of SkyTrain, 5-min. walk	D, E	15%	None, stayed at 15%	None, stayed at 15%
D	Larger	West of SkyTrain, 15-min. walk	C, E	15%	25%	50%
E	Smaller	West of SkyTrain, 10-min. walk	C, D	None	15%	15%
F	Smaller	South of SkyTrain, 10-min. walk	G	None	25%	50%
G	Smaller	South of SkyTrain, 10-min. walk	F	None	None, stayed at 0%	None, stayed at 0%

Note: the three shaded row pairs highlight comparable hotel pairs, as per the study design.

The study was designed so that in each of the three hotel pairs, workers at one hotel would receive the new or increased experimental subsidies while workers at the other would remain at the pre-study level (0% or 15%). Workers at the final, non-paired hotel also received the experimental subsidies. Pairing the hotels allows us compare workers' travel behaviour, including transit ridership levels and patterns, mode choice and commuting patterns, and quality of life, as well as workplace organization and performance.

Table 1 identifies which four hotels received the experimental subsidies and at what levels. The first experimental subsidies started in May and June 2018, with the increased experimental subsidies beginning in November 2018.

Design of the experimental subsidies

Following completion of the Wave 1 survey, we randomly selected one hotel from each of three pairs of hotels to receive an experimental transit subsidy, or in the cases of hotels where subsidies were already provided, an enhanced subsidy to bring the subsidy level to 25% (from 15%). As previously explained, in each pair of hotels, workers at one hotel

received the subsidy, while workers at the other hotel did not, with workers at Hotel E also receiving it. We informed the hotels that would be receiving the experimental (new or enhanced) subsidy after completion of the baseline survey in the first weeks of April 2018. We provided posters and text that managers could use to inform their staff about the availability of the subsidy. We informed Unite Here Local 40 of the subsidy decisions at the same time, and they also spread word of the experimental subsidy to their members.

Workers who wished to take advantage of the (new or enhanced) subsidy at their hotel were required to enrol in the Compass for Organizations program since this provides the mechanism for the study to reimburse these workers for the subsidy. However, worker participation in all aspects of the study remained voluntary and subject to individual consent. It was possible for employees to receive the experimental subsidy without answering the surveys.

We increased the subsidy from 25% to 50% at two hotels for the period from November 2018 to April 2019. The changes were announced to eligible workers after the Wave 2 survey, in the first weeks of October 2018. The goal of this further subsidy increase was to provide additional data on how workers would respond to transit price changes, in particular to identify and understand those workers whose travel patterns are highly price inelastic.

Data sources and variables

The study's various data collection and analysis elements are summarized in Table 2 and discussed further below. Full details of each method are provided in Appendix C. The hypotheses guiding the study can be found in Appendix B.

Table 2: Overview of key data sources and variables

Data source	Description	Key variables	Relation to study hypotheses
Wave 1 survey responses	Representative questionnaire survey of employees at 7 study hotels conducted in March 2018 (n = 774).	Travel patterns, commute on reference days, work status, quality of life, and demographics in March 2018.	Establishes pre-treatment baseline conditions at each hotel.
Wave 2 survey responses	Representative questionnaire survey of employees at 7 study hotels conducted in September 2018 (n = 902).	Travel patterns, commute on reference days, work status, quality of life, and demographics in September 2018.	Establishes conditions 4–5 months after introduction of experimental (including the new or increased subsidy) subsidy at 4 of 7 hotels.
Wave 3 survey responses	Representative questionnaire survey of employees at 7 study hotels conducted in March 2019 (n = 905).	Travel patterns, commute on reference days, work status, quality of life and demographics in September 2018.	Establishes conditions at one year following the introduction of the experimental subsidy (including the new or increased subsidy) at 4 of 7 hotels.
Wave 1, 2 and 3 matched responses	Matched responses create quasi-panels (waves 1 to 2, n = 452), (waves 2 to 3, n = 559) and (waves 1 to 3, n = 444).	Changes in travel patterns, commute on reference days, work status, quality of life and demographics matched for individuals, where such a match was possible based on the survey consent information.	Allows comparison of conditions before and after experimental subsidy for identical sub-population. Waves 1 to 3 compare March one year before and after the experimental subsidy.
Compass Card data	Monthly, from January 2018, Compass Card data for all enrolled cards at 4 or 5 hotels, and random comparison group of downtown commuters (n = 10,000).	Descriptive statistics (mean, standard deviation, etc.) per card per hotel, total cards and trips per month, distance, time of day and percent break-even.	Compass Card uptake and usage pre and post treatment at 4 or 5 study hotels, relative to usage by comparison group.
Human resource indicators	Spreadsheet completed monthly from January 2018 by human resource managers at 7 study hotels.	Total employees, turnover, recruitment and performance indicators.	Indicators of work performance and contextual indicators to interpret findings.
Organizational interviews	Structured interviews conducted in spring and fall 2018 with senior managers and union representatives at study hotels.	Commute infrastructure, policies and practices, other employment policies and performance.	Identification of changes in workplace practices, and contextual information to interpret findings.
Transit accessibility mapping	Indicators for 92 Lower Mainland forward sortation areas (FSAs), the first 3 digits of the postal code.	Transit score of level of transit service per FSA; road distance, transit time and number of segments from FSA centre to downtown.	Indicator of ease of commute by transit (versus driving) per FSA of residence, as identified in wave 1 and 2 surveys.
Parking survey	Parking availability and prices for each study hotel, measured in the block containing the hotel and the 8 blocks surrounding it. Surveyed in fall 2018.	Count of street and parking lot spaces, and average daily price around each study hotel.	Indicators of auto parking as alternative to transit use per hotel.

Survey responses

The primary data source is a survey of hotel workers, conducted three times over the course of a year, about their travel behaviour, workplace satisfaction, general life satisfaction, housing arrangements and income. This survey was conducted at a six-month interval (in March 2018, September 2018 and March 2019). Every employee at the seven hotels was eligible and encouraged to participate in the surveys, regardless of their commuting mode, subsidy uptake or enrolment in TransLink's CFO program. Recruitment took place at the participating hotels, with explicit support of hotel management and the union. Recruitment followed standard consent and incentive procedures, with an assurance of individual confidentiality through the aggregation of data. This survey data forms the core of this report.

Using name and contact information provided during the consenting process, we were able to match the survey responses across the survey waves. Most importantly, we identified and matched a subset of 444 respondents who completed both Wave 1 and Wave 3 surveys, which corresponds to the month of March one year before and after the experimental subsidies began. This group of respondents provided the basis for a quasi-cohort analysis of the relationship between subsidy offer and uptake, commute behaviour and other individual characteristics.

Compass Card data

Workers at the seven hotels were invited to enrol in TransLink's CFO program, which allows organizations to subsidize monthly transit passes, with the remaining cost paid for by individual employees through payroll deduction. CFO enrolment is voluntary and based on a contractual arrangement between TransLink and each employer (hotel). TransLink and Simon Fraser University have entered into a data-licensing agreement to provide the study with aggregated, non-identifiable secondary data on transit ridership for groups of hotel workers and a larger comparison group. The analysis and release of this data are governed by protocols to ensure that the privacy of users is respected, both in spirit and with respect to the Compass Card terms of service. Aggregated data was only released for groups of 35 or more Compass cards. Aggregated Compass Card data can be found in Appendix G.

Human resources indicators and organizational interviews

Participating hotels were asked to provide a set of standard monthly human resource indicators of worker recruitment and performance, as well as to allow individual managers to be interviewed about workplace matters such as organization, parking and travel. Union members at each hotel were also interviewed. As with the employee surveys, these interviews were repeated at six-month intervals for the duration of the study, with the March 2018 data providing a baseline. We used this data primarily to provide context and to help us interpret our analysis and findings. Discussion of these sources is in Appendix I.

Transit accessibility mapping

We asked respondents to provide the name of their place of residence, as well as their postal code. We were then able to associate more than 85% of people in each survey wave with a neighbourhood defined by the first three digits of the postal code, also known as the forward sortation area (FSA). For each FSA, we mapped accessibility to the downtown core. We considered driving distance, average transit commute time, number of transit segments required to reach the place of work, and level of service on the frequent transit network. Although aggregated by FSA, these indicators allow us to better understand the influence of those transportation factors on workers' commuting choices. These maps can be found in Appendix H.

Parking survey

We surveyed public parking availability and price in the areas surrounding each hotel in September and October 2018. We added this to the study after the first wave of the survey in response to feedback from study partners who were interested in how parking might affect workers' commuting choices. Results of the parking survey can be found in Appendix J.

Demographics: Who were the workers in our study population?

Transportation studies and the planning approaches they support tend to focus on geographical zones and mode choices, paying less attention to social and occupational differences in commuting needs and behaviours.[8] In this study we have striven to untangle and identify, where possible, how transit commuting and responses to the experimental subsidies varied by subgroups of our study population that have specific characteristics. Before diving into our main findings, we will discuss some basic demographic facts about our study population. This is intended to shed light on how this group of downtown hospitality workers is similar or different from the overall population of the City of Vancouver and the Vancouver census metropolitan area (CMA), especially when it comes to factors that affect their commuting needs and choices.

We emphasize here that our study population consisted of employees of seven hotels in downtown Vancouver. We invited all employees at each of the hotels to respond to our surveys, so our study population is not made up exclusively of union members or employees who provide services directly to guests. For example, it also includes managers, administrators and sales employees.

Hotel workers are on average older than the Vancouver population

Because our study focused on working people, our study population did not include people who were too young or old to be working. That said, our study population was somewhat older than the average for the city and region, as shown in Table 3. The percentage of the population that is between 55 and 64 years old in the City of Vancouver and the Vancouver CMA is 13% (or 18% to 21% of residents aged 20 to 64 years), while that age range made up 24% to 28% of our study population.[9] On the other end of the scale, those under 25 made up about 4% of our study population in all three waves of the survey, whereas those in the 20-to-24 age group alone make up about 7% of the City of Vancouver and Vancouver CMA populations. In the 35-to-44 age group, the percentage of our people in our study group was roughly matched (at 21%) with the percentage in the City of Vancouver's and Vancouver CMA's working-age population.[10] This older demographic has implications for our study because it may be harder to change the commuting patterns and choices of older workers. In our study population, the average number of years a respondent had worked in their current job ranged from 11 to 13, depending on the wave of the survey.[11]

[8] Peter Jones and Karen Lucas, "The Social Consequences of Transport Decision-Making: Clarifying Concepts, Synthesising Knowledge and Assessing Implications," *Journal of Transport Geography* 21 (2012): 4–16.
[9] Statistics Canada, "Census Profile, 2016 Census Vancouver, City [Census Subdivision], British Columbia and Vancouver CMA [Census metropolitan area], British Columbia" (Government of Canada, n.d.), https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=5915022&Geo2=CMACA&Code2=933&SearchText=Vancouver&SearchType=Begins&SearchPR=01&B1=All&TABID=1&type=0.
[10] Statistics Canada, "Census Profile, 2016 Census, City of Vancouver and Vancouver CMA, British Columbia."
[11] See Table 260, Appendix K.

Table 3: Percentages of main age groups in our study population versus City of Vancouver and Vancouver CMA

	Study population			All residents		Aged 20–64	
Age groups	Wave 1 %	Wave 2 %	Wave 3 %	CoV %	Van CMA %	CoV %	Van CMA %
Under 25	3.7	4.1	4.4	22.6	27.3	10.1	10.6
25–34	20.6	20.4	20.0	19.8	14.7	28.8	23.1
35–44	20.0	22.0	21.4	14.7	13.7	21.3	21.4
45–54	24.6	24.9	21.3	14.8	15.2	21.5	23.9
55–64	26.5	24.2	27.5	12.5	13.4	18.2	21.0
65 or older	4.6	4.3	5.3	15.5	15.7	n/a	n/a
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Hotel occupations encompass a full range of post-industrial jobs

Hotel occupations encompass a full range of post-industrial service sector work. We grouped these jobs into five job classes, as shown in Table 4. Housekeepers (also called room attendants at some hotels)[12] made up the largest percentage of our study population at 26% to 29% over the three waves, followed by food and beverage service workers, back of house workers, management and front of house workers. The food and beverage service job class includes banquet servers, bartenders, bar servers, restaurant servers, stewards, hosts, and those who provide room service. The front of house job class is made up of front desk workers, concierges, bell people, parking attendants and telephone staff. The back of house is a diverse job class made up of staff who are dishwashers, cooks, night cleaners, janitors, security people and maintenance staff (in some cases referred to as operations or engineering).

Table 4: Job classes of study respondents

Job class	Wave 1 %	Wave 2 %	Wave 3 %
Housekeeping	27.9	28.8	26.0
Food & beverage	21.8	22.8	24.8
Front of house	9.5	12.3	11.7
Back of house	18.1	18.3	20.3
Management and admin.	14.7	11.9	12.0
Multiple/unknown	7.9	5.9	5.1
Total	**100**	**100**	**100**

A quarter of hotel workers do not have regular shift start and end times

Across our three survey waves, 24% to 28% of our study population reported that they did not have regular start and end times for their shifts. Workers in food and beverage service were the least likely to have regular start and end times—in the three survey waves, 37%

[12] When we refer to "housekeepers" in this report we are also including "room attendants," and these seem to be the same or very similar jobs across the hotels.

to 48% reported that their shift start and end times were not regular. While the majority of our study population left and returned home within the hours that frequent transit service was available (6 a.m. to 9 p.m.), a substantial percentage—36% to 44%—in each wave did not.[13]

Hourly wages have relatively little variation

We asked workers to provide us with their hourly wage and/or monthly salary. While not everyone was willing to answer this question, the majority of respondents provided their hourly wage. When considering the hourly wage data in Table 5, it's important to keep in mind that the wages of some of these workers were supplemented with tips (workers who may be tipped include housekeepers, food and beverage service, and front of house). Also, because we combined the many jobs required to run a hotel into five major job classes (as well as one for those who did not provide a job title or had more than one job at their hotel), some of these five job categories contain greater wage variation. This is especially true of the management and administration job class.

For the most part, we did not see major variations in the mean hourly wages for those in different demographic groups. This wage compression is likely a result of the collective bargaining agreements in place at all the hotels in the study. For example, respondents who reported their gender as female and those who reported it as male had the same mean hourly wage of $21 in all three survey waves.

Those at the three smaller hotels (E, F and G) reported hourly wages that were $1 to $2 per hour under the overall mean of approximately $21, a statistically significant difference in all three survey waves. There was also a statistically significant difference in the hourly wages reported by renters and homeowners. In all three waves, renters reported hourly wages that were up to a dollar per hour lower.

[13] See Table 160, Appendix K, "Hours of work and regular shift start and end times." Also, TransLink, "Frequent Transit Network," n.d., https://www.translink.ca/Plans-and-Projects/Frequent-Transit-Network.aspx.

Table 5: Hourly wage ranges by job class, Wave 1

Job grouping	Mean (average) $/hr	N	Std. deviation	Std. error of mean	Min. $/hr	Max. $/hr
Housekeeping	21.73	460	1.898	0.089	14.00	27.24
Food & beverage	18.85	383	3.670	0.188	11.56	40.00
Front of house	19.99	146	3.096	0.256	11.35	24.54
Back of house	22.93	294	2.870	0.167	15.00	32.50
Management and admin.	25.80	75	8.298	0.956	16.00	55.00
Multiple/unknown	20.82	99	2.923	0.294	13.00	29.00
All	**21.19**	**1,456**	**3.845**	**0.101**	**11.35**	**55.00**

Transit costs relative to earnings

For context, the minimum wage in British Columbia at the time of the Wave 1 survey (March 2018) was $11.35, and it rose to $12.65 in June 2018.[14] The cost of a single public transit ride within one transit zone in March 2018 was $2.85, though this cost was slightly discounted if the trip was paid for with a Compass Card using "stored value."[15] A one-zone transit pass cost $93 in March 2018. A two-zone transit pass cost $126 and a three-zone $172. An across-the-board fare increase took effect in July 2018.[16]

Housing costs in relation to transit

The cost to rent a one-bedroom apartment in the downtown and West End areas of Vancouver, which, depending on the precise location of the home and hotel, would allow workers to easily commute by walking, biking or bus in under 30 minutes, ranged from $1,469 to $1,590 in October 2018, according the Canada Mortgage and Housing Corporation.[17] In less central areas of Vancouver, such as the Marpole neighbourhood (which is still a one-zone transit commute), the average rent was $1,048. In Burnaby, which is farther away and a two-zone commute by transit, the average rents were $1,149, and in

[14] CBC News, "B.C.'s New Minimum Wage Now in Effect," June 1, 2018, https://www.cbc.ca/news/canada/british-columbia/b-c-s-new-minimum-wage-now-in-effect-1.4687188.

[15] TransLink currently employs a zone fare pricing scheme. The City of Vancouver comprises Zone 1. The inner suburban municipalities to the south, north and west of the city comprise Zone 2. The outer suburban municipalities further to the east and south of the city comprise Zone 3. The fare for a journey depends on mode and zone boundaries crossed. All journeys by bus are priced as one-zone fares. Journeys by light rail (SkyTrain) start as one-zone fares and increase each time a zone boundary is crossed. In March 2018, adult fares were as follows: one-zone: $2.85; two-zone: $4.10; three-zone: $5.60. The price of monthly Compass passes was as follows: one-zone: $93; two-zone: $126; three-zone: $172. On July 1, 2018, fares increased so that in September 2018, adult fares were as follows: one-zone: $2.95; two-zone: $4.20; three-zone: $5.70. The price of monthly Compass passes was as follows: one-zone: $95; two-zone: $128; three-zone: $174. It is also possible to buy tickets in advance through the "stored value" option, which provides a discount on single tickets. For more information, including rates for concession tickets and passes, see TransLink, "Fare Pricing," n.d., https://www.translink.ca/Fares-and-Passes/Fare-Pricing.aspx.

[16] TransLink, "Fare Pricing."

[17] Canada Mortgage and Housing Corporation, "Rental Market Report, Vancouver CMA," October 2018, https://eppdscrmssa01.blob.core.windows.net/cmhcprodcontainer/sf/project/cmhc/pubsandreports/rental-market-reports-major-centres/2018/rental-market-reports-vancouver-64467-2018-a01-en.pdf?sv=2018-03-28&ss=b&srt=sco&sp=r&se=2021-05-07T03:55:04Z&st=2019-05-06T19:55:04Z&spr=https,http&sig=bFocHM6noLjK8rlhy11dy%2BkQJUBX%2BCDKzkjLHfhUIU0%3D.

Surrey (still farther away and a three-zone transit commute), $978. In all cases, however, these averages camouflage considerable differences in rents based on the age of a building, its amenities and how long the tenant has rented the same unit, which means that some renters pay considerably higher or lower rents than these averages suggest.

In 2018, the living wage for Metro Vancouver, as calculated by the Canadian Centre for Policy Alternatives as part of its campaign for a living wage for families, was $20.91 per hour.[18] This is the hourly wage the centre determined was necessary for each of two parents in a family with two children to earn while working full-time to "pay for necessities, support the healthy development of their children, escape severe financial stress and participate in the social, civic and cultural lives of their communities."[19]

More than half of hotel workers are women

Our study population had a somewhat higher proportion of women than the general populations of both the City of Vancouver and the Vancouver CMA. In both the city and the CMA, 51% of the total population was female, as of the 2016 Census. In our study population, the percentage of female respondents was slightly higher, ranging from 52% to 54% over three survey waves.[20] When looking more specifically at the census segments of the city and CMA populations that earned employment income (in 2015), the female over-representation in our study population becomes more apparent. Of that subgroup, 50% in the city and 49% in the CMA were female, compared to 52% to 54% of our study population.

Note that when answering the gender question, we also allowed respondents to indicate that they preferred not to say, or to indicate "other" or "nonbinary," neither of which was an available option on the 2016 Census. Percentages for "prefer not to say" ranged from 0% to 0.5%. Percentages for nonbinary were 2.7% in Wave 1 and 0% in the other two waves. These variations may be due to slight changes in the wording of this question between the waves.[21]

Women made up 75% to 81% of respondents in the housekeeping job class across all three survey waves. They also made up 61% to 63% of those in management and administration. The majority of workers in the back of house job class were men, making up 71% to 78% of respondents. The male-female split was more even in the food and beverage service and front of house job classes, though both of these tended to have slightly more men.

[18] Iglika Ivanova, Seth Klein and Tess Raithby, "Working for a Living Wage: Making Paid Work Meet Basic Family Needs in Metro Vancouver, 2018 Update, Canadian Centre for Policy Alternatives" (Canadian Centre for Policy Alternatives, April 2018), https://www.policyalternatives.ca/sites/default/files/uploads/publications/BC%20Office/2018/04/BC_LivingWage2018_final.pdf.
[19] Ivanova, Klein and Raithby, "Working for a Living Wage."
[20] See Table 249, Appendix K.
[21] See Table 249 in Appendix K for these frequencies and the question wording for each version of the survey. Copies of the surveys themselves are in Appendix D.

Gender and commuting

Knowing that women tend to have more household and childcare responsibilities and that tending to these often requires making stops on the way to or from work, we analyzed reported stops on the way to and from work by gender, using responses from all three waves of the survey.

We found that among the studied hotel workers, women were slightly more likely to have at least one stop on the way to or from work, although men were slightly more likely to make drop-offs (of children, partners or others) than women (10% versus 8%). Overall, however, these differences were not pronounced; for example, 69% of men had no stops on their way home but so did 67% of women.[22]

Hotel workers are more likely to be immigrants

Even though Metro Vancouver is already known within the province and country for attracting immigrants, our study population had a much higher percentage of immigrants than the overall populations of either the City of Vancouver or Metro Vancouver. In 2016, 43% of the city's resident population were immigrants—slightly higher than the 41% of the population of the Vancouver CMA.[23] In contrast, immigrants made up 77%, 78% and 76% of our study populations for waves 1, 2 and 3. In all three waves of the survey, immigrants who moved to Canada as an adult (18 years or older) made up more than 60% of respondents.[24]

Adult immigrants were concentrated within some job classes. Across all three survey waves, 87% to 92% of housekeepers had moved to Canada as adults. Adult immigrants made up 53% to 64% of the back of house job class. The management and administration group had the workers most likely to have been born in Canada, at 44% to 48% across the survey waves.[25]

Hotel workers are more likely to be visible minorities

Our study population has a much higher percentage of visible minorities (using the census definition) than the population of the City of Vancouver or Metro Vancouver, which are both areas with concentrations of visible minorities compared to other parts of the province and country. In our study population, the percentage of visible minorities ranged from 70% to 77% over the three waves. In the City of Vancouver, 52% of the population identified as a visible minority as of 2016. In Metro Vancouver, 49% of the population did. As with immigrants, visible minorities were more concentrated in some job classes. They were 91% to 94% of housekeepers across all three survey waves. Similarly, 76% to 80% of those in the back of house job class were visible minorities. In management and administration, 52% to 56% were visible minorities, with the percentages in other job classes ranging between 60% and 72%.

[22] See tables 261 and 262, Appendix K.
[23] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[24] Table 250, Appendix K.
[25] Table 274, Appendix K.

English is a second language for the majority of hotel workers

For the second and third waves of the survey, we added an open-coded question about language to help us improve the coding of responses to the ethnicity question. We purposely worded this question in a way that was nearly identical to the 2016 Census so that we could collect comparable data. Our question in both waves was, "What is the language that you first learned at home in childhood and still understand?"[26] As shown in Table 6, we found that our study population had a much lower percentage of people who learned English or French "at home in childhood" than the overall populations of the City of Vancouver and the region. The percentage of our study population that learned English "at home in childhood" was 32% in the second wave and 29% in the third. In the city and region, the percentages who indicated they had learned English "at home in childhood" were 51% and 54%, respectively, as of the 2016 Census.[27]

While it is certainly possible and even common to become fluent in a language other than the one you learned at home as a child, it is also reasonable to assume that some people operating in a second or third language they did not learn as a child will be more challenged to interpret instructions and maps in that language than native speakers, and that these challenges could pose obstacles to navigating and using public transit systems. Although we observed only a few such cases, some respondents did require language assistance to complete the questionnaire we used to gather data for this study.

Table 6: Language first learned at home in childhood

	Wave 2		Wave 3		City of Vancouver		Vancouver CMA	
	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %	Frequency	Valid %
English	595	31.6	538	28.9	319,115	51.3	1,316,635	53.9
French	25	1.3	22	1.2	9,480	1.5	25,000	1.0
Neither	1,266	67.1	1,300	69.9	274,210	44.0	1,020,255	41.8
Total	**1,886**		**1,860**		**602,805**	**96.8***	**2,361,890**	**96.7***
Missing	217	10.3	217	10.5				

* Note: does not add to 100% because the census questionnaire allows respondents to indicate multiple languages.

About half of hotel workers live in the City of Vancouver

As shown in Table 7, our study population lives all over Metro Vancouver, with only 11% to 12% living in downtown Vancouver in all three survey waves.[28] However, in all three survey waves, we found that 48% of our study population lived in the City of Vancouver (plus 0.1% living in the neighbouring University of British Columbia area). Only 26% of the overall population of Metro Vancouver lives in the City of Vancouver (according to the

[26] This was question 17 in both cases. See Appendix D for copies of the survey. In the 2016 short form of the census, the corresponding question was 9: "What is the language that this person first learned at home in childhood and still understands?" Statistics Canada, "2016 Census of Population Questions, Short Form," n.d., https://www12.statcan.gc.ca/census-recensement/2016/ref/questionnaires/questions-eng.cfm.
[27] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[28] This table provides the same information as Table 252 in Appendix K, but is duplicated here for ease of reference.

2016 Census).[29] The fact that a much higher percentage of our study population lived in Vancouver makes sense given the downtown location of respondents' workplaces, and it means that almost half of our study population was within a one-zone transit pass of their work. Further, the percentage of the study group working in the same municipality where they lived is also higher than for the general population of the region, of which only 44% live and work in same municipality, according to the 2016 Census.[30]

However, the flip side is that more than half of our study population, many of whom have to work at off-peak hours or on irregular schedules, had to spend the time and money required to cross fare zones to get to work. After Vancouver, Burnaby was the municipality with the next highest proportion of residents in our study population, ranging from 14% to 16% over the course of the study. The percentage of our study respondents who lived in Surrey (combined with Delta and White Rock) ranged from 13% to 14%. The percentages of our study population living in the other regions of Metro Vancouver were quite stable over the three survey waves.

Table 7: City or subregion of residence

	Wave 1		Wave 2		Wave 3	
City or region	**Frequency**	**Valid %**	**Frequency**	**Valid %**	**Frequency**	**Valid %**
Downtown Vancouver	209	11.4	205	10.5	230	11.8
Other Vancouver incl. UBC	676	37.1	745	38.0	711	36.4
Burnaby	252	13.8	314	16.0	318	16.3
Surrey, White Rock, Delta	250	13.7	266	13.5	245	12.5
Richmond	99	5.4	137	7.0	117	6.0
New Westminster	60	3.3	66	3.4	63	3.2
Tri-Cities (Coquitlam, Port Coquitlam, Port Moody, Anmore, Belcarra)	156	8.6	133	6.8	142	7.3
North Shore (West Vancouver, City of North Vancouver, District of North Vancouver)	92	5.0	69	3.5	97	5.0
Eastern (Maple Ridge, Port Moody, the Langleys, Abbotsford)	29	1.6	28	1.4	30	1.5
Subtotal	1,823	100	1,963	100	1,952	100
Missing	106		141		125	
Total	**1,929**		**2,103**		**2,077**	

One of the concerns on the part of both Unite Here Local 40 and hotel management that motivated this study was the challenges that employees were having finding and keeping affordable housing close to their downtown workplaces and the commuting challenges that result from that. In addition to the opportunity costs of long commutes, longer commutes are generally more stressful and less predictable, through delays, missed connections or mode changes. The dispersal over time of lower-income households to the outer regions of the City of Vancouver and Metro Vancouver has been the subject of scholarly interest, such

[29] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[30] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."

as in the work of David Hulchanski, among others.[31] However, our study took place over only one year, which is insufficient time to observe and measure whether hotel workers are moving from homes downtown or in the City of Vancouver to housing farther away from work.

We did, however, find considerable differences among where the various occupational groups live, especially regarding the downtown core. For example, in all three waves of the survey, only 3% to 4% of housekeepers lived in downtown Vancouver, where they would be closest to their jobs and most likely to be able to walk or cycle to work, compared to 18% to 24% of those in management and administration jobs.[32] The percentage of food and beverage employees living downtown varied widely by survey wave, perhaps because of seasonal variation (20%, 9% and 14%). As previously noted, this is an occupational group that is more likely to have shifts requiring them to travel at hours when transit service is reduced. Some employees in the back of house job class were also more likely to have to travel during off-peak hours. People working these types of jobs were only slightly more likely than housekeepers to live in downtown Vancouver, with the percentages ranging from 7% to 9% over the three survey waves.

Almost half of hotel workers are renters

Respondents who live in renting households made up 45% to 46% of our study population over waves 1, 2 and 3 of the survey.[33] This is a considerably lower percentage of renters than in the City of Vancouver, where 53% of households rented, according to the 2016 Census. However, regionally, renters were a much lower percentage of households: 36%. This meant that the households in our study population were more likely to rent than Metro Vancouver households overall.

There were no strong patterns of tenure difference by job class. Among those in management and administration jobs, 54% to 58% owned their homes across the three survey waves. However, the percentage of owners among housekeepers ranged from 53% to 63%, and the percentage of owners in back of house staff ranged from 60% to 62%. Food and beverage service workers were the least likely to own their homes, with percentages ranging from 44% to 53%.[34]

Hotel workers face the same regional housing stresses

We used the definition of affordability from the Canada Mortgage and Housing Corporation, which says that when a household spends more than 30% of its gross income on shelter

[31] See, for example, David Hulchanski, "What Is Happening to My Neighbourhood? The Socio-Spatial Restructuring of Vancouver, Calgary, Toronto and Montréal, 1970 to 2015," Lecture presented at the Warren Gill lecture, Vancouver, BC, December 2017, https://www.youtube.com/embed/IUfeqEHW4Zs?version=3&hl=en_US&rel=0&showinfo=0&autohide=2&enablejsapi=1&origin=http://www.sfu.ca.
[32] See tables 271 to 273 in Appendix K for figures in this paragraph.
[33] See Table 257, Appendix K.
[34] Table 275, Appendix K.

costs, that housing is unaffordable for the household.[35] In each of the three survey waves, more than 30% of our study population reported living in unaffordable housing (31%, 34% and 31% for waves 1, 2 and 3).[36] This is in line with the regional percentage of 32% of households living in unaffordable housing in 2016. In the City of Vancouver, the percentage of households living in unaffordable housing was 37%.[37]

Hotel workers have longer than average commutes

More members of our study population faced long commutes than was the case for city and regional residents overall. We calculated commute times to work based on survey responses to questions we asked about leaving and arrival times on the reference day. In Table 8, we have provided that data for each survey wave, along with commute duration data from the 2016 Census (National Household Survey).[38] As Table 8 shows, only about 4% of our respondents had commutes of 15 minutes or less, whereas in the city and region, 17% and 18% did. On the longer end, 49%, 51% and 43% of our study population on the reference day over the three waves had commutes of at least 45 minutes, compared to only 6% of City of Vancouver and 11% of regional residents in 2016.[39]

Table 8: Duration of commute to work

Duration of commute in minutes	Wave 1 %	Wave 2 %	Wave 3 %	CoV %	Metro Vancouver %
Less than 15	3.6	4.0	4.3	16.5	17.9
15 to 29	17.7	16.2	19.2	39.5	32.4
30 to 44	30.1	28.5	33.8	28.2	26.4
45 to 59	20.5	24.7	15.6	9.6	12.0
60 and over	28.2	26.6	27.0	6.2	11.3
Total	**100**	**100**	**100**	**100**	**100**

We found that the mean duration of respondents' trips to work (without stops) was 44 to 46 minutes for all three waves. The mean duration of trips home (without stops) was 50 to 52 minutes across all three waves.[40]

Differences in the length of commute by job class were noticeable. For instance, less than 1.5% of housekeepers in any of the survey waves had commutes to work of 15 minutes or less. From 18% to 24% of food and beverage service staff across the three survey waves

[35] Canada Mortgage and Housing Corporation, "Housing in Canada: Definitions of Variables" (Canada Mortgage and Housing Corporation, n.d.), see "Affordable Housing" https://cmhc.beyond2020.com/HiCODefinitions_EN.html#_Affordable_dwellings_1.
[36] Table 259 in Appendix K.
[37] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[38] The question on the 2016 National Household Survey was "How many minutes did it usually take for this person to get from home to work?" Question 44(b). Statistics Canada, "2016 Census of Population Questions, Long Form (National Household Survey)," December 8, 2015, https://www12.statcan.gc.ca/nhs-enm/2016/ref/questionnaires/questions-eng.cfm.
[39] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[40] Table 260, Appendix K.

had commutes of 60 minutes or more. This is also a group of workers that tends to work irregular and off-peak hours.[41]

We found little difference in the average duration of women's commutes compared to men's, with the exception of commutes to home with stops. The gender gap in commutes home with stops was eight minutes, with women's commutes lasting 71 minutes and men's 63 minutes.[42] Women's longer commutes home with stops may have reflected women stopping to shop on the way home.

Summary

Overall, this review of selected characteristics of the study population shows that this group of hotel workers varied from the populations of the surrounding city and region: they were more likely to be older, female, immigrant, visible minority and to not have English or French as one of their first languages. The study population had a higher percentage of renters than the region, though not than the City of Vancouver. As a group, these hotel workers also tended to have longer commutes than city and regional residents.

This workforce, like the city and region in which it was situated, was an extremely diverse one, but patterns were also apparent. In terms of occupations, housekeepers and back of house staff tended to have the lowest wages, the longest commutes and the highest representation of visible minority and immigrant respondents. Those who worked in management and administration jobs earned the highest wages and also tended to have shorter commutes. Women dominated the housekeeping job class, but also management and administration. Men made up most of the back of house job class.

Given the occupational and demographic diversity in our study population, our study is well-positioned to add nuance and detail to the existing picture downtown workers and commuters in a post-industrial economy.

[41] See Table 263, Appendix K.

[42] See tables 261 and 262, Appendix K.

Our findings: What did we learn?

Overall, we observed that the bigger the subsidy, the more positive the relative transit effect. Behind this overall finding lies the complicated relationship between hotel work, commute-mode choice and employee transit subsidies. While we had many hypotheses about what the effects of the subsidy would be at the outset of the study (see Appendix B) we also learned much that we did not expect or have hypotheses about when we began our data collection. In this section we have provided 12 key findings, some of which respond to our original research questions and hypotheses and some of which reveal new data and respond to questions raised along the way.

For an offer of an employee transit subsidy to translate into increased transit use by those employees, certain conditions must be satisfied. The employees need to be aware of the subsidy offer, and it needs to be available to them, in that they need to qualify for it and find it conveniently structured. Before they can take advantage of the subsidy, they then need to enrol in the program, and they may need to change their transit payment arrangements, commuting method and related routines. All of these processes take place within the context of employees' wider mobility practices, choices and constraints, and influence final commute outcomes takes some time. Drawing upon the full range of data sources and analysis presented in detail in the appendices, we present here 12 key findings about how different levels of transit subsidy affected the transit use, commuting choices, quality of life and workplace organization of this set of hotel workers.

Finding 1: These hotel workers were highly engaged with the transit system

Transit engagement refers to transit behaviours that range from having a Compass Card, to including some transit in one's commute, to purchasing a monthly transit pass product, to accepting a transit subsidy and to commuting only by transit.

We knew at the outset of this study that these hotel workers were high transit users and commuters: Unite Here Local 40 and hotel management told us so, based on their front-line experience with their membership and employees. Indeed, the fact that so many of these workers use transit was one of the motivations for establishing the 15% transit subsidy in the first place. However, the data we've collected for this study has quantified and built on that knowledge, providing us with a more detailed and nuanced picture of how these workers commute and use transit. It has also enabled us to contextualize their transit and commute patterns within city and regional transit usage patterns.

Engagement with public transit can be measured in different ways, including whether it is used at all, used for commuting or for non-work purposes and whether it is combined with other modes. Since our study investigates the use of a transit subsidy administered through payroll deduction on a monthly pass, it is also relevant to look at methods of payment as a way to understand any changes in these employees' relationship to public transit. Acceptance of the transit subsidy itself is a dimension of employees' relationship to public transit. We examined all these aspects of our study population's engagement with public transit, but for purposes of establishing a baseline of March 2018, we will limit this section

to discussing use of transit, commuting modes, use of Compass Cards and monthly Compass Card products, and subsidy acceptance.

As well as providing the context that allows us to understand the effects of the experimental subsidies, this baseline picture is inherently valuable because most studies that look at transit use or the effect of subsidies on transit use and commuting do not specify or differentiate impacts by occupational group or other characteristics.

Transit usage in the last month

In Wave 1 of the survey, 89% of respondents reported taking public transit in Metro Vancouver in the past month.[43] This is considerably higher than the 52% of employed Metro Vancouverites who reported doing so in the *2018 Transit Incidence Survey* conducted by the Mustel Group for TransLink.[44] In the same survey, 77% of the total respondents living in the City of Vancouver and 46% of those living in the rest of Metro Vancouver reported using public transit in the last 30 days.[45]

We also looked at transit use by job class in our study population. In Wave 1, 94% of housekeepers reported using public transit in the last month.[46] This was the highest percentage of any of five broad job classes, with food and beverage service workers reporting the lowest rate of transit use at 83%.[47]

Commute mode

As we see in Table 9, overall, 54% of our respondents were transit-only commuters on the days we surveyed them for the Wave 1 survey in March 2018. Data from the 2016 Census helps to put that in broader perspective, though the census question was worded somewhat differently than in our survey. In the City of Vancouver, only 30% of people used transit as the way they "normally get to work."[48] In the Vancouver CMA, only 20% did.[49] The percentage of people using transit to get to and from work in our study population was also substantially higher than the share of trips to work by transit reported in trip diaries completed for TransLink's 2014 *Transportation Panel Survey,* which was based on a representative sample of 3,071 Vancouver residents at least 15 years old.[50] In that data, 27% of trips to work were by transit, 41% by auto, 9% by bike and 23% by walking. In our first survey, only 23% had auto-only commutes on the reference day, though another 14% combined auto with transit or some other mode. Our study population was also much less likely to commute by walking or cycling than city residents, though the rates were more similar to those for the region.

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[43] Table 142, Appendix K.
[44] Mustel Group, *2018 TransLink Transit Incidence Survey* (Vancouver, BC: TransLink, June 2018), Dataset 1. Total number of interviews was 1,003, conducted on Metro Vancouver residents aged 18 years and older. Data provided by Lyle Walker, TransLink, May 22, 2019.
[45] Mustel Group, *2018 TransLink Transit Incidence Survey*.
[46] Table 276, Appendix K.
[47] Table 276, Appendix K.
[48] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[49] Statistics Canada, "Census Profile, 2016 Census City of Vancouver and Vancouver CMA."
[50] TransLink, *Transportation Panel Survey: 2014 Final Report* (2014). "Exhibit 4-9—Comparison of Panel Survey Trips to Work." Also, 2-4 to 2-8 for sample details.

Table 9: All commute modes, Wave 1

	Wave 1	
Commute mode	**Frequency**	**Valid %**
Transit-only	1,034	54.0
Walk-only	148	7.7
Bike-only	24	1.3
Combined transit, walk, cycle	19	1.0
Auto-only	431	22.5
Auto and transit	240	12.5
Auto and other	20	1.1
Subtotal	**1,916**	**100**
Missing	13	
Total	**1,929**	

The proportion of hotel employees with transit-only commutes in Wave 1 varied considerably by job class. Housekeepers had the highest share of this mode, at 75%, with only 38% of managers and administrators making transit-only commutes. Managers and administrators had the highest percentage of auto-only commute mode, but also a high percentage of active commuters (16%). As shown in Table 10, housekeepers and back of house employees had the lowest percentages of active commuters in Wave 1, which makes sense given that only 3% to 4% of housekeepers and 7% to 9% of back of house workers lived in downtown Vancouver (across the three survey waves), compared to 18% to 24% of those in management and administration jobs.[51]

Table 10: Commute mode by job class, Wave 1

	Combined to work and home commute mode class				
Job class	**Transit-only %**	**Auto-only %**	**Active-only %**	**Combined Modes %**	**Total %**
Housekeeping	74.9	13.9	2.1	9.2	100
Food & beverage	40.7	26.8	15.8	16.7	100
Front of house	39.9	22.4	15.8	21.9	100
Back of house	59.2	22.1	5.5	13.2	100
Management and admin.	38.4	32.0	15.5	14.1	100
Multiple/unknown	51.0	24.5	7.9	16.6	100
All	**53.9**	**22.5**	**9.4**	**14.1**	**100**

Considerable differences in commute mode by hotel were also apparent. This is no surprise, given the locations of the pairs of hotels in relation to transit and parking. Hotel D was farthest from transit and had a correspondingly low transit-only commute percentage and the highest percentage of auto-only commuters, despite the availability of a 15% transit subsidy. Hotel E was closer to transit than Hotel D and, despite the absence of a subsidy at the time of the Wave 1 survey, had a much higher percentage of transit-only commuters.

[51] As per the demographics section and tables 271 to 273 in Appendix K.

Table 11: Major commute modes by hotel, Wave 1

Hotel	Transit subsidy % at baseline	Transit-only %	Walk-only %	Auto-only %	Auto & transit %
A	15	59.8	12.3	8.7	16.1
B	15	59.7	7.4	14.8	15.7
C	15	66.0	6.1	12.3	9.4
D	15	34.3	3.8	48.1	11.4
E	None	63.3	7.8	21.1	7.8
F	None	47.8	9.8	29.3	6.5
G	None	50.6	10.1	30.4	6.3
All		**54.0**	**7.7**	**22.5**	**12.5**

* Note: the three shaded row pairs highlight comparable hotel pairs.

Has a Compass Card and monthly pass product

In Wave 1 of the survey, 90% of our total respondents had a Compass Card, which can be used to pay for single trips as needed using "stored value" or used as a monthly pass. At the time of the baseline survey, 62% of our total respondents had some type of monthly pass product on their Compass Card.[52] Although a strict comparison is not available, the proportion of hotel workers who held monthly pass products appeared to be much higher than the proportion of Compass Card holders in general. According to TransLink, in March 2019, 75% of Compass Cards, excluding specialty types of passes, had only stored value.[53]

Again, housekeepers held Compass Cards at the highest rate, 96%.[54] They were also the group that held monthly pass products (of some sort) at the highest rate, which was 77%.[55] The front of house staff (84%) and food and beverage (86%) job classes had the lowest percentages of Compass Card holders.[56] The management and administration (47%) and food and beverage job classes (49%) had the lowest percentages of monthly pass product holders.[57] As shown in Table 12, respondents at Hotel D, the least transit-accessible location, held monthly pass products at the lowest rate (52%), but the highest rates were not at those hotels adjacent to SkyTrain stations (hotels A and B), but instead were at hotels C and E, both of which were a short walk from a SkyTrain station.

[52] See tables 144 and 147, Appendix K.
[53] Specialty passes not available to the general public include those available to university students, those for children or seniors, and those available to people on provincial or federal income assistance programs, as well as cash products.
[54] See Table 270, Appendix K.
[55] See Table 270, Appendix K.
[56] See Table 270, Appendix K.
[57] Subsidy acceptance rates for all waves of the survey can be found in Table 16 (Finding 3).

Table 12: Monthly pass product by hotel, Wave 1

Hotel	Transit subsidy % at baseline	Has a monthly Compass Pass product %
A	15	60.1
B	15	64.3
C	15	72.1
D	15	52.0
E	None	66.7
F	None	60.5
G	None	56.7
All		**61.6**

Note: the three shaded row pairs highlight comparable hotel pairs.

Subsidy acceptance

In Wave 1, 28% of respondents said that they had accepted a transit subsidy from their employer, with 43% reporting that while their employer offers a transit subsidy, they had not accepted it.[58] We did not ask first wave respondents why they had not taken up a subsidy that was offered by their employer, but we did in subsequent waves and we discuss those reasons later (see Finding 7).

Among occupational groups, housekeepers were the job class with the highest percentage of subsidy accepters in Wave 1, with 41% of them doing so. Front of house staff were the second biggest group to accept the subsidy at 27%, followed by food and beverage service workers (25%), management and administration (20%) and back of house workers (20%).[59]

Subsidy acceptance also varied among the four hotels (A, B, C and D) where the 15% subsidy was available at the time of the first survey, and before the new and enhanced experimental subsidies became available. Hotel C had the highest rate of subsidy acceptance (48%) and Hotel A the lowest (21%), despite its location near transit. Hotel D, which is the farthest from transit, had the second-lowest subsidy acceptance rate (23%) and a high percentage of respondents indicated that a subsidy was available but they had not accepted it.

[58] See Table 141, Appendix K.

[59] Subsidy acceptance rates for all waves of the survey can be found in Table 16 (Finding 3). Note that management were not eligible for the subsidy as of March 2018, Wave 1 of the survey, but some hotels allowed management to have the experimental subsidies after that for the duration of the study.

Table 13: Subsidy acceptance rate by hotel, Wave 1

Hotel	Yes, my employer offers a transit subsidy and I have taken it up %	My employer offers a transit subsidy, but I have not taken it up %	No, my employer does not offer a transit subsidy %
A	20.8	43.3	*35.9
B	41.8	52.2	*5.9
C	47.9	36.5	*15.6
D	23.0	57.4	*19.6
E	**2.2	**11.1	86.7
F	**2.2	**2.2	95.7
G	0.0	**4.3	95.7
All	28.4	42.8	28.9

Note: rows for each wave add to 100%. The three shaded row pairs highlight comparable hotel pairs.
* Employees may have mistakenly indicated that their employer does not offer a transit subsidy.
** Employees may have mistakenly indicated that their employer offers a transit subsidy.

Finding 2: Some workers remained unaware of the transit subsidies throughout the study period

We found notable differences in awareness of the subsidy across the hotels (see Table 14). As expected, the increase in awareness was greatest at the two hotels (E and F) where a new subsidy was introduced through the study, but awareness also increased by more than 6% from waves 1 to 3 at hotels A and D, which both saw their existing subsidies enhanced through the study.

We also note that some respondents provided answers to the question about subsidy offers and uptake that were likely incorrect, further confirming a lack of awareness of the transit subsidies. For example, 2% of employees at hotels E and F appeared to believe at the time of the Wave 1 survey that they were receiving a transit subsidy from their employer, despite working at a hotel that did not offer a subsidy at that time. It is theoretically possible that these people were receiving a transit subsidy from another employer, though this is unlikely given the rarity of employer-sponsored transit subsidies in Metro Vancouver. At Hotel E, 11% of respondents said that they were offered a subsidy but had not taken it up: it's possible that these workers had heard about transit subsidies offered at other hotels.

Almost all respondents at Hotel G, which did not have a subsidy, correctly indicated that they did not receive a subsidy. However, sizeable percentages of respondents at the other six hotels (between 12% and 54%) in the wave 2 and 3 surveys inaccurately stated that their employer did not offer a subsidy. It is possible that some respondents (at hotels E and F in particular) may have interpreted the "subsidy offer" responses in the questionnaire as not applying to them—in that they may have been aware that the "study" (i.e., Simon Fraser University or the City of Vancouver) was paying for the transit subsidy at their hotel, rather than their own employer. Furthermore, at hotels A to D where the subsidy was available to (unionized) workers, some respondents would not have been eligible for it, since it was agreed to through collective bargaining that the benefit was limited to those who had worked for at least one year at their hotel. Conversely, hotels D, E and F offered the

experimental transit subsidy to all employees, regardless of their occupation or union status.

Table 14: Percentage of employees who perceived the subsidy as available to them, by hotel, for all survey waves

		Percentage of employees potentially eligible for transit subsidy			Percentage of employees who perceived the subsidy as available to them		
Hotel	Subsidy treatment	Wave 1 %	Wave 2 %	Wave 3 %	Wave 1 %	Wave 2 %	Wave 3 %
A	Subsidy increased 15% to 25%, then constant	85.6	89.4	88.3	64.1	77.6	70.4
B	Subsidy fixed at 15%	80.0	86.7	88.1	94.0	87.8	77.1
C	Subsidy fixed at 15%	97.9	95.7	97.3	84.4	85.9	86.3
D	Subsidy increased 15% to 25%, then to 50%	100	100	100	80.3	80.8	87.4
E	New subsidy at 15%, then constant	0	100	100	13.5	45.6	57.4
F	New subsidy at 25%, then to 50%	0	100	100	3.4	71.0	80.4
G	No subsidy	0	0	0	4.5	3.4	5.1
All		**72.0**	**87.3**	**87.5**	**64.3**	**74.7**	**73.7**

Note: unweighted data. The three shaded row pairs highlight comparable hotel pairs.

In summary, it is clear that some employees were, and remained through all waves of the survey, unaware that an existing or experimental employer transit subsidy was available to them. However, for methodological reasons during the baseline survey (Wave 1) our survey teams avoided informing employees that a subsidy existed. The degree to which workers reported being unaware of the benefit suggests that further efforts to inform employees about the availability of the subsidy could increase acceptance. This would financially benefit those workers who learn of the subsidy and already commute by transit, and for those who commute by auto, it could encourage eventual commute-mode switching.

Finding 3: As the transit subsidy level increased, subsidy acceptance increased overall and was also higher among specific groups of workers

Overall, subsidy acceptance among our study population increased by an average of 6%. In our baseline survey (Wave 1), we found that a little over a quarter (28%) of total employees at the seven hotels used a transit subsidy. In Wave 2, after we had increased existing subsidies at two of those four hotels and introduced new subsidies at two of the three others, the acceptance rate increased to almost a third (31%) of total workers at the study hotels, and rose to 34% by Wave 3, following the second set of subsidy increases. Subsidy uptake increased at those hotels where an existing subsidy was enhanced (hotels A and D), decreased where there was no change (hotels B and C), and rose as expected where a new subsidy (hotels E and F) was offered.

Among the four hotels that offered a 15% subsidy at the outset of the study, subsidy acceptance increased the most from waves 1 to 3 of the survey (by 15%) at Hotel A, which is adjacent to a SkyTrain station and which saw an increase in the subsidy to 25%. Subsidy acceptance was considerably higher at Hotel F (55%), where the experimental subsidy grew from 25% to 50% from waves 2 to 3 of the survey, in contrast to Hotel E, where a lower subsidy of 15% was introduced and stayed at that level for the rest of the study. There, the subsidy acceptance rate was only 23%, despite being somewhat closer to a SkyTrain station.

Table 15: Subsidy acceptance rates by hotel, all survey waves

Hotel	Subsidy treatment	Wave 1 %	Wave 2 %	Wave 3 %	Waves 1 to 3 change %
A	Subsidy increased 15% to 25%, then constant	20.5	35.3	35.6	15.2
B	Subsidy fixed at 15%	41.5	37.1	33.2	−8.3
C	Subsidy fixed at 15%	47.4	34.6	36.7	−10.8
D	Subsidy increased 15% to 25%, then to 50%	22.5	24.7	34.2	11.7
E	New subsidy at 15%, then constant	n/a	12.1	22.7	22.7
F	New subsidy at 25%, then to 50%	n/a	43.3	55.0	55.0
G	No subsidy	n/a	n/a	n/a	n/a
Average		**27.7**	**30.8**	**33.8**	**6.1**

Note: data cleaned of incorrect responses, and weighted. The three shaded row pairs highlight comparable hotel pairs.

Overall, our analysis found that an increase of a percentage point in the subsidy level increased the likelihood of someone changing to accept the subsidy by 1.035 times.[60] This means that increasing the dollar value of a transit subsidy by 10 percentage points will increase the chances that someone will adopt the subsidy by about a third. However, there appear to be diminishing returns to higher subsidy levels, and some subsidy accepters in Wave 1 dropped the subsidy by Wave 3.

Subsidy acceptance by subgroups of workers

We also investigated how subsidy acceptance varied among subgroups of the study population, including through multivariate analysis and analysis of our quasi-panel of 444 respondents for whom we matched their responses from waves 1 to 3 of the survey.[61]

Our analysis found that hotel employees who were more likely to accept the subsidy had the following characteristics:

- had regular shift start and end times,
- lived farther from downtown, and
- were immigrants.[62]

[60] See Table 91, Appendix F.
[61] While we don't consider the quasi-panel group to be strictly representative of the overall study population, it is a large enough matched set to yield usable and useful insights. See Appendix E for an explanation and more details of our matching process and characteristics of the group.
[62] See Table 84, Appendix F.

Those who were less likely to accept the subsidy had access to an auto or lived downtown.[63]

Among our quasi-panel, we found distinct and statistically significant patterns of subsidy acceptance. The following groups were more likely to accept the subsidy from waves 1 to 3:

- Those who worked weekends: 21% accepted the subsidy versus 12% of those who didn't work weekends.[64] We suggest that this reflected the current pricing advantage of weekends, which, when combined with the experimental subsidy, was sufficient to trigger acceptance.
- Households with children at home: 26% accepted the subsidy versus only 13% of households without children at home.[65]
- Renters: 22% of renters accepted the subsidy versus 13% of homeowners.[66]
- Newer employees: 29% of newer employees accepted the subsidy versus 15% of employees who started work before 2016.[67]

Subsidy acceptance differences by job class

At the outset of the study, housekeepers were the job class with the highest rate of subsidy acceptance. That was still the case at the end of the subsidy, with the exception of our miscellaneous job category, which included workers who had more than one job at their hotel or who did not answer this question. The percentage of housekeepers who had accepted a transit subsidy had increased by 4% by Wave 3 of the survey, so that 45% of housekeepers reported accepting the subsidy. However, this increase from a high baseline was dwarfed by double-digit increases in some other job classes. Subsidy acceptance increased by 14% among back of house staff, growing from 20% to 33% from waves 1 to 3. Similarly, it increased by 11% among front of house workers, growing from 27% to 38% over waves 1 to 3. There was very little change in the acceptance rate among food and beverage workers and management and administration employees.[68]

Considered in light of hourly wages for these job classes, it is not surprising that housekeeping, back of house and front of house workers (as well as those with more than one job at their hotel) were eager to accept the subsidy.[69] Regardless of its impacts on commute modes, the experimental transit subsidies could be considered equity enhancing, in that, except for those in the study population who live close enough to work to walk or cycle there, commuting costs money. We know that less than 10% of our study population walked or cycled to work at the outset of our study, that the employees of the study hotels faced longer commutes than city or regional residents overall, and that these differences

[63] See Table 84, Appendix F.
[64] See Table 67, Appendix E.
[65] See Table 68, Appendix E.
[66] See Table 69, Appendix E.
[67] See Table 70, Appendix E.
[68] In the management and administration category, managers were not eligible for the subsidy at the hotels where the subsidies were available before the study began. In some cases, hotels made the experimental subsidies available to managers for the duration of the study, as shown in Table 19.
[69] See Table 5 in the demographics section of this report for data on hourly wages.

were amplified by occupation.[70] Providing a transit subsidy may not always be effective at motivating workers to shift to more sustainable modes when many of them are already commuting by transit, but saving money on their commuting costs undoubtedly benefits them in other important ways.

Table 16: Subsidy acceptance rates by job class, waves 1 to 3

Job class	Wave 1 %	Wave 2 %	Wave 3 %	Waves 1 to 3 change %
Housekeeping	41.2	42.3	44.9	3.7
Food & beverage	25.4	26.8	25.7	0.3
Front of house	27.3	22.4	38.2	10.9
Back of house	19.7	31.3	33.2	13.5
Management and admin.	20.1	21.2	24.1	4.0
Multiple/unknown	27.5	44.0	46.7	19.2
All	**28.3**	**31.8**	**34.5**	**6.2**

Subsidy acceptance by zone

Table 17 shows that employees' fare zone of residence does not perfectly line up with their monthly pass product. For example, 95% of those who lived in Zone 1 who had accepted the subsidy had a Zone 1 pass, where at least one of their workplaces was also located. However, only 83% of those who lived in Zone 2 who had taken up a subsidy had a two-zone pass, and only 68% of those who lived in Zone 3 who had accepted the subsidy had a three-zone pass. In general, workers were more likely to "down-zone" their monthly pass purchases: 20% of Zone 2 residents with a monthly pass had a one-zone pass; only 3% had a three-zone pass. This is an expected pattern given how off-peak fares are structured and the long hours and sometimes fluctuating weekly schedules of hotel employees.

We also observed that among residents of all zones, those who had accepted the transit subsidy were generally more likely to have a monthly pass product that matched their fare zone of residence than those who had not taken up an available subsidy. That is, with the exception of those who lived in Zone 3 and were not offered a subsidy, the proportion of those whose pass matched their zone of residence was higher for those accepting the subsidy than those who did not accept it or were not offered it.

Hence, it is possible that allowing employees more flexibility as to the type of monthly pass product they sign up for would result in higher (or better matched) subsidy uptake.

[70] See Table 8 for overall duration of commute (demographics section) and Table 263 (Appendix K) for commute durations by job class.

Table 17: Fare zone of residence by zone product held, by transit subsidy uptake

Fare zone of residence	Current employer subsidy?	Monthly pass product			
		1-zone %	2-zone %	3-zone %	Total %
	Yes, my employer offers a transit subsidy and I have taken it up	94.8	4.1	1.1	100
	My employer offers a transit subsidy but I have not taken it up	88.6	8.8	2.7	100
	No, my employer does not offer a transit subsidy	91.3	4.5	4.2	100
1	All Zone 1 residents who are product holders	92.4	5.3	2.2	100
	Yes, my employer offers a transit subsidy and I have taken it up	16.3	82.7	1.0	100
	My employer offers a transit subsidy but I have not taken it up	23.2	71.8	5.0	100
	No, my employer does not offer a transit subsidy	24.1	70.8	5.1	100
2	All Zone 2 residents who are product holders	19.9	77.2	3.0	100
	Yes, my employer offers a transit subsidy and I have taken it up	8.4	23.6	68.0	100
	My employer offers a transit subsidy but I have not taken it up	17.6	19.5	62.9	100
	No, my employer does not offer a transit subsidy	11.0	14.0	75.0	100
3	All Zone 3 residents who are product holders	11.2	21.0	67.8	100

Note: pooled wave 1, 2 and 3 data, weighted.

Recall that to receive the existing, new or enhanced transit subsidy, workers at the study hotels had to sign up through the Compass for Organizations (CFO) program for some type of monthly pass product. Table 18 shows an expected pattern of an increase in the proportion purchasing monthly pass products at hotels A, D, E and F, where the subsidy level increased or was new, and a decline at hotels B and C, which had no change in subsidy. There was an unexpected, small increase in monthly pass products purchased at Hotel G, where there was no subsidy. For a breakdown of the types of Compass Pass products purchased, see tables 143 to 153 in Appendix K.

Table 18: Monthly pass product by hotel, wave 1, 2 and 3 surveys

		Has a monthly pass product			
Hotel	Subsidy treatment	Wave 1 %	Wave 2 %	Wave 3 %	Wave 1 to 3 change %
A	Subsidy increased 15% to 25%, then constant	60.1	69.6	61.9	1.8
B	Subsidy fixed at 15%	64.3	63.6	59.1	−5.2
C	Subsidy fixed at 15%	72.1	61.2	61.5	−10.6
D	Subsidy increased 15% to 25%, then to 50%	52.0	50.0	53.1	1.1
E	New subsidy at 15%, then constant	66.7	70.0	79.3	13.6
F	New subsidy at 25%, then to 50%	60.5	69.4	62.0	1.5
G	No subsidy	56.7	62.7	58.9	1.8
All		**61.6**	**61.9**	**59.6**	**−2.0**

Note: the three shaded row pairs highlight comparable hotel pairs.

Finding 4: Eligibility, together with financial and administrative barriers, prevented some workers who were regular transit users from accessing and accepting the subsidy

The availability of the subsidy was subject to certain eligibility conditions. While these were fairly standard at the four hotels where the subsidy had been established through

collective bargaining before the study, they varied at the two hotels where the study introduced new subsidies, and also varied somewhat, at least temporarily, where the study increased subsidies. Similarly, the hotels varied somewhat regarding the practical details of subsidy implementation. For example, where the study introduced new subsidies (hotels E and F) the study bore the entire financial cost of those subsidies, which, combined with the temporary nature of the subsidies, made it easier for those hotels to take a more flexible approach to eligibility and to matching the pass zones to residential addresses. Generally, at the four hotels where subsidies existed before the study, the following eligibility and implementation restrictions were in place:

- Employees became eligible for the subsidy after one year of employment.
- Employees were required to commit to participating in the payroll deduction (CFO) program for six months to obtain the subsidy.
- Employers' default practice was to subsidize the monthly pass for the zone that corresponded to the employee's home address, i.e., an employee who lived in Vancouver (Zone 1) could not obtain a subsidized pass that allowed travel to Zone 3 (Surrey). However, as Table 19 shows, some employers were willing to allow employees to have a pass for a lower zone than their home zone, i.e., a worker who lived in Burnaby (Zone 2) could request a subsidized pass for Zone 1 rather than Zone 2.

The differences we found in subsidy eligibility and implementation among the hotels that offered a transit subsidy over the course of the study are shown in Table 19.

There are valid operational and financial reasons for some eligibility and administrative restrictions on the subsidy. Employers may be reluctant to subsidize the cost of the more expensive three-zone monthly passes for employees who live in the same zone as they work (Zone 1). Similarly, there is an administrative cost to managing payroll deductions, and that cost goes up when employees can move in and out of the program at will. It is also reasonable for employers to want to establish that an employee will be staying on the job past the first few days or weeks before allowing them to sign up for a benefit.

Table 19: Differences in eligibility and administration of the subsidy by hotel[71]

Hotel	Subsidy treatment	Eligibility	Time commitment	Zone restriction
A	Subsidy increased 15% to 25%, then constant	One year of employment	Requires six-month commitment to participate in payroll deduction	Allows workers to down-zone their passes if hours they work are off-peak
B	Subsidy fixed at 15%	Three months	Does not require a six-month commitment to the payroll deduction	Subsidizes pass only for the zone of residence
C	Subsidy fixed at 15%	One year of employment	Requires six-month commitment to participate in payroll deduction	Allows workers to down-zone their passes
D	Subsidy increased 15% to 25%, then to 50%	One year of employment; also offered to non-union employees	Does not require a six-month commitment to the payroll deduction	Provides the subsidy for whatever zone workers request
E	New subsidy at 15%, then constant	Immediate eligibility; also offered to non-union employees	Does not require a six-month commitment to the payroll deduction	Provides the subsidy for whatever zone workers request
F	New subsidy at 25%, then to 50%	Immediate eligibility; also offered to non-union employees	Does not require a six-month commitment to the payroll deduction	Provides the subsidy for whatever zone workers request

However, we found some evidence that eligibility restrictions limited subsidy acceptance. In waves 1 and 2, respectively, 28% and 32% of respondents reported that they had accepted the transit subsidy, which was only available to those who agreed to purchase some form of monthly pass product through the CFO program. However, Table 20 shows that a considerably larger percentage—62% of Wave 2 respondents and 57% of Wave 3 respondents—indicated that they did have some type of monthly pass product. The purchase of a monthly pass is a strong indication that the pass owner uses transit regularly, because otherwise, it would not make financial sense to do so. The substantial gap between the percentage of respondents who had a monthly pass and the percentage who had accepted the subsidy indicated that there were transit commuters in the study population for whom the subsidy was likely either not available, not convenient or not perceived as financially worthwhile in its current form.[72] This means it's possible that more employees would accept the subsidy and potentially also eventually reduce their private auto use if these disincentives were adequately addressed.

Similarly, Table 20 shows that 42% of those who did not take up a (theoretically) available subsidy at the time of the Wave 2 survey had a monthly pass product. For Wave 3, it was 35%. This again indicates that there remains a subgroup of regular transit users who have not accepted the (theoretically) available transit subsidies. Furthermore, among those who

[71] We collected this information on subsidy administration during interviews with managers at each hotel.
[72] We discuss various "break-even" scenarios in the section on Finding 9.

were not offered (or aware of) a transit subsidy, 56% had some type of monthly pass product.

Table 20: Monthly pass by transit subsidy uptake, wave 2 and 3

	Has a monthly pass product					
	Wave 2 %			Wave 3 %		
	No	Yes	Total	No	Yes	Total
Yes, my employer offers a transit subsidy and I have taken it up	8.0*	92.0	100	14.3*	85.7	100
My employer offers a transit subsidy but I have not taken it up	57.6	42.4	100	64.9	35.1	100
No, my employer does not offer a transit subsidy	44.3	55.7	100	43.2	56.8	100
All	37.8	62.2	100	40.4	56.6	100

* Although these respondents indicated that they accepted a transit subsidy, they did not have a monthly pass when surveyed. This discrepancy could result from misreporting either response, although in some cases the responses could have been accurate if the reported subsidy acceptance was for the month following the survey response.

Our study asked about reasons for not taking up the transit subsidy. Among the reasons provided, our coding of the survey responses to this question identified two categories that may be directly influenced by design of the subsidy program: inconvenience (9%) and unavailability (7%). Furthermore, there may be latent demand for transit subsidies due to a lack of awareness about their existence and availability. This suggests that subsidy uptake and hence transit use may be increased by modifications to qualification and enrolment rules. One possible modification would be to allow at-will (monthly) enrolment in the transit subsidy program, rather than requiring a commitment for a fixed time period. It may also be desirable to allow flexibility in which type of monthly pass product an employee is allowed to sign up for from month to month.

Finally, we acknowledge that for some workers who already commute by transit, signing up to pay for a monthly pass through payroll deduction may not make financial sense, because, whether by their choice or not, they may not work enough hours at their hotel in a month to justify paying for a monthly pass, even if that pass is available at a discounted rate. This may be especially true for certain types of hotel workers, such as banquet servers, who are more likely to work on call and for whom seasonal fluctuations in the tourism industry are more acute.

Finding 5: Transit commuting increased overall, and it increased more at the hotels where the experimental transit subsidies were available than at the hotels where they weren't

At the outset of this study, we hypothesized that increasing an existing transit subsidy or introducing a new transit subsidy would increase transit use and transit commuting by workers. Our data supports both these hypotheses.

Results from our analysis lend further support to our hypotheses on the effect of the experimental subsidies in that we found that a percentage point increase in the subsidy level increased the likelihood of someone changing to become a transit *user* (though not necessarily a transit commuter) from waves 1 to 3 of the survey by 4.4%.[73] This means that increasing a transit subsidy by 23 percentage points doubles the chances that someone will become a transit user, although the chances that any individual will make such a change in any given year are low. Similarly, when we analyzed the results from our quasi-panel of respondents matched from waves 1 to 3 of the survey, we found that the share of transit-only commuting increased by 1.1% from waves 1 to 3, with a 0.9% decrease in the share of auto-only commuting.[74]

Recall here that a key aspect of the study design involved selecting and pairing hotels based on their similar locations relative to transit and then making the experimental subsidy available to only one hotel in that pair. Looking at responses from survey waves 1 to 3 for those three hotel pairs, Table 21 shows change in transit commuting as follows:

- Hotel A (increased subsidy to 25%) had a larger increase than Hotel B (no change to subsidy level of 15%).
- Hotel D (increased subsidy to 25% then 50%) had an increase, while Hotel C (no change to subsidy level of 15%) had a decline.
- Hotel F (new subsidy at 25% then 50%) had a larger increase than at Hotel G (no subsidy and no change).

We focus our discussion here on changes from waves 1 to 3 of the survey, since that March-to-March (2018 to 2019) period allowed the most time for workers to accept the experimental subsidies and change their commuting choices accordingly and also because the March-to-March comparison eliminates seasonality issues. Table 21 shows the percentages of employees for each main commute mode, focusing on transit-only, walk-only, auto-only and auto-and-transit commuting at each hotel for all three waves.[75]

Hotel A, a workplace that is well served by transit, appears to represent a case of where price elasticities of transit demand are high. Its subsidy level moved from 15% to 25% from waves 1 to 3 and its percentage of transit-only commuter went from 60% to 67% over the

[73] Table 90, Appendix F.
[74] Table 65, Appendix E.
[75] We acknowledge here that we chose not to use a multi-day trip diary for this study, but instead asked respondents about their mode of travel to work on only two specific days (the "reference days"). This means that our classification of commuters by mode is based on limited observations. On the reference days, for example, a regular transit user may have driven to work because of some unusual errand, just as a regular auto commuter may have taken transit to work because their auto was being serviced. In other words, our data may show a higher, but nevertheless randomly distributed, level of misclassification of commute modes than would be seen with a longer reporting period.

same period, reaching 71% in Wave 2 before dipping back down again. The other three main commute modes each decreased by approximately 2% from waves 1 to 3. Meanwhile, there was almost no change in the percentage of transit-only commuters at the paired Hotel B over this period, and very little change to any other commute-mode percentages. This result is consistent with our hypotheses.

At Hotel D, where the subsidy was increased from 15% to 25% and later to 50% over the course of the study, we only saw a jump in transit-only commuting after the second increase to the experimental subsidy, i.e., in the Wave 3 survey results. There was essentially no change in transit-only commuting when the subsidy was increased from the baseline of 15% to 25% from waves 1 to 2. However, from waves 2 to 3, transit-only commuting increased from 33% to 42%, and this was also when a corresponding decline in auto-only and auto-and-transit commuting took place. This is notable in light of Hotel D's location, which is the least well served by SkyTrain. Hotel D also had the largest percentage of auto-only commuters at the outset of the study. By the end, this percentage had decreased by about 6%. These results indicate that a larger subsidy was needed to move workers from auto to transit commuting at locations that were less convenient to transit. Even after this decrease, Hotel D still had the highest share of auto-only commuters, and in the Wave 3 survey, 30% of respondents at Hotel D gave "driving" as the reason why they didn't accept the subsidy, or as a comment about their commute. This rate was more than twice that at the hotel with the next highest rate of "driving" reasons or comments.

At the paired Hotel C, which received no enhancement to its existing subsidy, there was actually a decrease in transit-only commuting over the study period, while walk-only and auto-only commuting both increased noticeably. Hence the relative changes at this hotel pair (C and D) are also an expected result.

Hotel F's increased transit-only commuting (48% to 50%) from waves 1 to 3 also represents a small, but expected, response to the new, relatively high-value experimental subsidy offered here. It was surprising, however, that the transit-only commute mode decreased from waves 2 to 3, after the additional increase of the experimental subsidy from waves 2 to 3 (25% to 50%). The lack of response to the even higher subsidy at Hotel F may highlight the differences with Hotel D. At Hotel D, cheaper parking and less transit accessibility meant that a larger subsidy (50%) was required to shift behaviour. In contrast, with respect to expensive parking and better transit access, Hotel F is more like Hotel A, and so the lower subsidy level (25%) achieved the shift in behaviour.

Table 21: Percentage of employees by main commuting mode at each hotel, all survey waves

		Transit-only %			Walk-only %			Auto-only %			Auto and transit %		
Hotel	**Subsidy treatment**	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 1**	**Wave 2**	**Wave 3**	**Wave 1**	**Wave 2**	**Wave 3**
A	**15% to 25%, then constant**	59.8	70.5	67.0	12.3	6.8	10.0	8.7	8.6	6.5	16.1	10.4	14.1
B	**15%, no change**	59.7	61.0	60.4	7.4	6.4	8.8	14.8	13.8	14.0	15.7	14.6	14.4
C	**15%, no change**	66.0	58.4	55.4	6.1	9.9	11.1	12.3	16.7	19.2	9.4	9.2	10.4
D	**15% to 25%, then to 50%**	34.3	33.0	42.3	3.8	4.2	5.3	48.1	49.3	42.3	11.4	11.2	7.1
E	**New 15%, then constant**	63.3	56.7	61.6	7.8	5.6	5.8	21.1	26.7	24.4	7.8	11.1	5.8
F	**New 25%, then to 50%**	47.8	55.4	50.0	9.8	11.9	10.9	29.3	25.7	24.5	6.5	6.9	9.1
G	**0, no change**	50.6	56.6	51.7	10.1	7.2	11.5	30.4	26.5	27.6	6.3	4.8	6.9
All		**54.0**	**54.8**	**55.8**	**7.7**	**6.7**	**8.7**	**22.5**	**23.9**	**21.6**	**12.5**	**11.1**	**11.0**

Note: the three shaded row pairs highlight comparable hotel pairs.

The percentage of auto-only commuters at Hotel F did decrease by 5% from waves 1 to 3 of the survey, which is another expected result. Hotel G, which had no subsidy throughout the study period and was paired with Hotel F, also saw an increase (1%) in transit-only commuting over the study period. While this was smaller than the non-subsidized Hotel F's increase in this mode, this result tells us something about the limits of a subsidy to influence mode shift among a group with high baseline rates of transit commuting. Overall, results for this pair of hotels are moderately consistent with our hypotheses.

The decline in transit commuting at the unpaired Hotel E (new subsidy at 15%) and the increase in auto commuting there was unexpected, especially because this hotel is relatively well located for transit. One factor (not shown in the tables) at Hotel E is that 10% of respondents stated that the transit subsidy was not available to them, which is statistically significantly different from the 6% rate for respondents at all hotels. However, this explains lower subsidy acceptance more directly than transit commuting per se.

Table 22 simplifies and reiterates the results found in Table 21 by providing only net percentage changes in commute modes by hotel, from waves 1 to 3. It shows that the two hotels that saw the biggest jumps in transit-only commuting were hotels A and D, which both saw increases to their existing 15% subsidy levels from March 2018 to March 2019 (waves 1 and 3 of the survey). Transit-only commuting at these hotels increased by 7% and 8% respectively, and auto-only and auto-and-transit commuting shares declined.

However, it is important to emphasize that the size of the positive impact of the subsidies on transit-only commuting varied. For example, among all employees, we found that at Hotel A—which is adjacent to the SkyTrain and is surrounded by expensive parking and where at least 60% of workers were already transit-only commuters—a 67% subsidy increase (from 15% to 25%) increased the share of transit-only commuting to 67% of workers (a 12% increase in the number of transit-only commuters at that hotel, or a 7 percentage point increase in the transit share). In contrast, at Hotel D—which is farther from the SkyTrain and where only 34% of workers were transit-only commuters at the time of the baseline survey—a 233% subsidy increase (from 15% to 50%) increased the share of transit-only commuting to 42% of workers (a 23% increase in the number of transit-only commuters at that hotel, or an 8 percentage point increase in the transit share).

Or, put differently, the total share of transit-only commuting increased by the same amount (a 7 or 8 percentage point increase) at both hotels, but it took a much larger subsidy increase to achieve that result at the hotel that was farther from the SkyTrain compared to the one that was beside the SkyTrain.

Table 22: Summary of main commute mode percentage changes by hotel, waves 1 to 3

		Change from waves 1 to 3 in (selected) main commute mode			
Hotel	Subsidy treatment	Transit-only %	Walk-only %	Auto-only %	Auto and transit %
A	15% to 25%, then constant	7.2	−2.3	−2.2	−2.0
B	15%, no change	0.7	1.4	−0.8	−1.3
C	15%, no change	−10.6	5.0	6.9	1.0
D	15% to 25%, then 50%	8.0	1.5	−5.8	−4.3
E	New 15%	−1.7	−2.0	3.3	−2.0
F	New 25%, then to 50%	2.2	1.1	−4.8	2.6
G	0%, no change	1.1	1.4	−2.8	0.6
All		1.8	1.0	−0.9	−1.5

Note: the three shaded row pairs highlight comparable hotel pairs. Hotel E was not paired.

Overall change in transit-commute percentage

While the transit commuting shifts were most dramatic when looking at the paired hotels, our analysis of survey responses also showed an overall increase of 1.7% in transit-only commuting from the time of the baseline survey (Wave 1) in March 2018 to the final (Wave 3) survey in March 2019, as shown in Table 23. Auto-only commuting decreased by 0.9% overall during the same period. We note as well that while there was a small decline in bike-only commuting from waves 1 to 3, walk-only commuting increased by 1% and commutes that combined transit with walking and cycling increased by 0.4%.

While these are transit- and auto-commuting shifts are small percentage changes, we regard them as notable given that our data shows that our study population was already commuting on transit at far higher rates than city and regional residents. And these levels of transit commuting are high considering that, as discussed in our earlier demographics section, more than half of our respondents lived outside the City of Vancouver and already commuted for more than 30 minutes, that 36% to 44% (over the three survey waves) of our respondents left and returned home outside the hours when the most frequent and reliable transit service is available (6 a.m. to 9 p.m.) and that 24% to 28% did not have regular shift start or end times. Other factors that mitigate against a mode shift from auto to transit commuting include that this workforce tends to be older than the overall population of Vancouver, in that TransLink data shows use of transit declines with age.[76] Also, the average number of years a worker had been employed at their hotel at the time of the first survey was 13, which is a lot of time for existing commute patterns to become established. Finally, on-site subsidized parking was available to employees at some of the hotels, which also subtracts from the subsidy's financial benefits, which we discuss in findings 9 and 10.

Finally, it is useful to consider these results in light of longer-term shifts to transit-commuting in the City of Vancouver and Metro Vancouver. In 1996, 24% of City of Vancouver residents and 14% of Metro Vancouver residents gave "public transit" as the

[76] TransLink, "Transit Use Incidence 2018 by Muni, Age, Gender." 2018.

answer to the census question about their main way of getting to work.[77] Twenty years later, those shares had increased by 6 percentage points in each case. A 2% increase in the transit-only commuting share over the course of one year among this group of workers is all the more notable in this historical context.

Table 23: Combined to-work and to-home commute mode class

	Wave 1		Wave 2		Wave 3	
	Frequency	**Valid %**	**Frequency**	**Valid %**	**Frequency**	**Valid %**
Transit-only	1,034	54.0	1,115	54.8	1,147	55.7
Walk-only	148	7.7	135	6.6	179	8.7
Bike-only	24	1.3	24	1.2	17	0.8
Combined transit, walk, cycle	19	1.0	33	1.6	30	1.4
Auto-only	431	22.5	487	24.0	445	21.6
Auto and transit	240	12.5	224	11.0	226	11.0
Auto and other	20	1.1	15	0.7	15	0.7
Total (valid)	**1,916**	**100**	**2,034**	**100**	**2,058**	**100**
Missing	13		70		19	
Total	**1,929**		**2,103**		**2,077**	

Decrease in reported use of transit in the last month, waves 1 to 3

While transit commuting increased overall as well as in generally expected ways in our paired hotels, we did observe a small decline in one aspect of engagement with transit, which was the number of people who reported taking transit in Metro Vancouver in the past month. This type of transit use decreased by 4% from waves 1 to 3. We are not sure why this was the case, but the decline should be viewed in the light of the already high level of transit use among downtown hotel workers.

Within this general decline, the pattern of relative declines among the paired hotels was as expected. Specifically, transit use at enhanced-subsidy Hotel A declined by 0.3% compared to a 3% decline at the paired constant-subsidy Hotel B. The contrast was even clearer with respect to the enhanced-subsidy Hotel D (−3%) relative to paired constant-subsidy Hotel C (−11%). In the case of Hotel F, which received a new subsidy, transit use increased by 4%, while at the paired no-subsidy Hotel G, transit use declined by 11%.

These results are, for the most part, confirmed by analysis of the Wave 1 to Wave 3 quasi-panel. Table 65 in Appendix E shows an overall decline of 5% in transit use. Transit use declined 6% in the enhanced-subsidy Hotel D quasi-panel but declined by 13% in the constant-subsidy Hotel C quasi-panel. Transit use increased 6% in the newly subsidized Hotel F quasi-panel but declined 14% in the no-subsidy Hotel G quasi-panel. However, the transit use in the past month declined 2% in the enhanced-subsidy Hotel A quasi-panel but declined by only 1% in the constant-subsidy Hotel B.

[77] Statistics Canada, 1996 Census for City of Vancouver and Metro Vancouver, https://www12.statcan.gc.ca/english/census96/data/profiles/Index-eng.cfm.

Table 24: Transit usage in the last month by hotel, all survey waves

		Has used transit in the last month			
Hotel	**Subsidy treatment**	**Wave 1 %**	**Wave 2 %**	**Wave 3 %**	**Wave 1 to Wave 3 change %**
A	Subsidy increased 15% to 25%, then constant	93.8	92.2	93.5	−0.3
B	Subsidy fixed at 15%	94.1	94.2	91.3	−2.8
C	Subsidy fixed at 15%	93.8	89.2	83.0	−10.8
D	Subsidy increased 15% to 25%, then to 50%	80.6	75.5	78.0	−2.6
E	New subsidy at 15%, then constant	82.2	85.7	70.9	−11.3
F	New subsidy at 25%, then to 50%	79.6	82.7	83.6	4.1
G	No subsidy	89.3	88.0	78.4	−10.9
All		**89.3**	**87.0**	**85.5**	**−3.8**

Note: the three shaded row pairs highlight comparable hotel pairs.

Finding 6: Specific subgroups of workers were more likely to commute by transit and were more likely to change their commute with the subsidy

So far we have seen that transit commuting increased in mostly expected ways at the hotels that received new or enhanced subsidies in relation to those that didn't, and that the cumulative result of these hotel-specific increases was a 1.7% increase in transit commuting overall from the baseline survey in March 2018 to the third and final survey March 2019.

These findings directly answer our research question, but we wanted to delve further into the characteristics of those who commuted by transit or switched to transit commuting during the study period. Given that our study population had higher percentages of women, immigrants and visible minorities than the (working) populations of the surrounding city and region, we were especially curious about the commuting choices of these groups. In Finding 3, we discussed our observations about how response to the subsidy differed among subgroups of our study population. In this section, we focus on what we learned about how transit commuting varied among specific subgroups of the study population, and in so doing we respond to several of our hypotheses (see Appendix B for those hypotheses).

Our analysis of the entire set of survey responses collected over the three waves of the survey revealed that the following groups were more likely to commute either partly or completely by transit, so confirming several of our hypotheses:

- workers at transit-adjacent hotels,
- Zone 2 residents,

- housekeepers,
- commuters with no stops for shopping, drop-offs, etc., on their commutes, and
- immigrants.[78]

While these groups do not exactly match those whom our analysis found to be more likely to accept the subsidy, there is overlap in that immigrants were both more likely to accept the subsidy and more likely to have a commute involving transit.

We also saw that housekeepers had a high rate of subsidy acceptance at the outset of the study and that this continued through all three waves of the survey. Our analysis found that they were also more likely to use transit to commute. Given that between 75% and 81% of those in the housekeeping job class were women in all three survey waves, this data sheds light on the gendered nature of subsidy acceptance and transit use among these hotel workers.

The fact that those who lived in Zone 2 were more likely to use transit in their commutes is also consistent with our analysis showing that those who lived further from downtown were more likely to accept the subsidy. TransLink's Zone 2 includes the cities of Burnaby, New Westminster, Richmond, West Vancouver and North Vancouver, as well as the District of North Vancouver, all of which are adjacent to the City of Vancouver, albeit across Burrard Inlet in the case of the three North Shore municipalities (West Vancouver, North Vancouver and the District of North Vancouver). In addition to the bus network, Burnaby, New Westminster and Richmond each have multiple SkyTrain stations, and the North Shore is serviced by the SeaBus. This suggests that it was the combination of proximity and better transit infrastructure that made Zone 2 residents more likely to have commutes involving transit than Zone 1 commuters, some of whom lived close enough to use active commute modes. It was predictable that Zone 3 commuters, who lived further from the downtown core, employed modes other than transit; in many cases (depending on their location and municipality) distance from SkyTrain or frequent bus service made them less likely to use transit as part of their commuting.

Looking at our quasi-panel of respondents matched from waves 1 to 3 (444 respondents), we found that among this group, people who commuted during off-peak hours (as indicated by reporting that they left home or work between 6:30 p.m. and 1:00 a.m. on weekdays) became more likely to have some transit in their commute from March 2018 to March 2019. This could be considered parallel to how in this same quasi-panel, those who worked weekends were more likely to accept the subsidy. On weekends and at off-peak hours (i.e., after 6:30 p.m. on weekdays), commuters can travel through all three TransLink zones for the cost of a one-zone fare. The combined savings available through off-peak travel and a transit subsidy may be enough to persuade commuters to include transit in their commutes.[79]

[78] See Table 86, Appendix F. Also tables 264, 266 and 268, Appendix K.
[79] See Table 71, Appendix E.

Certain groups of workers increased their use of transit from waves 1 to 3 at higher rates

Finally, we found that specific groups of workers increased their use of transit over the course of the study at a higher rate than others. We note that we are not suggesting these increases in transit use were directly caused by the experimental subsidies or were statistically significant. Instead we are merely observing that, based on our survey data, these changes took place from waves 1 to 3 of the survey. We focus our observations in this section to groups of workers not touched on elsewhere.

Workers who switched to include any transit in their commute

Looking at workers who switched to include any use of transit in their commutes from waves 1 to 3, we found that 20% of those who lived in the eastern parts of Metro Vancouver made this change, which was by far the highest of any of the regions.[80] However, this jump took place within the context of a small number of people in our study population who lived in this area—about 30 people in all three survey waves.[81]

Meanwhile, about 12% of those who lived in downtown Vancouver (with total residents ranging from 205 to 230 people) made this change.[82]

Workers who switched to transit-only commuting

When it comes to switching to commute by transit only, we found the following: 16% of Richmond residents within our study population made this commute mode change from waves 1 to 3 of the survey. This was highest of any of the regions. Next were Burnaby and Tri-Cities (Coquitlam, Port Coquitlam, Port Moody, Anmore and Belcarra) residents, both at 10% each.[83]

About 22% of workers who started their jobs in 2018 switched to transit-only commuting from waves 1 to 3 of the survey, which was far higher than any other group of workers who had been at their jobs for longer than a year. The next highest group of transit-only switchers was those who started working at the study hotels in the 2000s, and only 12% of these switched.[84]

Among visible minorities, 10% switched to become transit-only commuters from waves 1 to 3 of the survey, versus only 3% of those who were not members of a visible minority.[85]

Among households that included non-working adults, 13% switched to transit-only commuting from waves 1 to 3, while only 6% of households that did not include non-working adults switched.[86]

Among housekeepers, 12% switched to transit-only commuting, which was higher than any other job class except those in the "multiple/unknown" class (they switched at the same

[80] See Table 278, Appendix K.
[81] See Table 7 in the demographics section of this report.
[82] See Table 278, Appendix K. Also Table 7 in the demographics section of this report.
[83] See Table 264, Appendix K.
[84] See Table 265, Appendix K.
[85] See Table 266, Appendix K.
[86] See Table 267, Appendix K.

rate). About 9% of food and beverage workers and front of house workers also switched to transit-only commuting from waves 1 to 3.[87]

While we looked to see if there were differences in the rate at which men and women changed their transit use from waves 1 to 3, we did not find any notable patterns. The same is true for other groups not mentioned here.

Finding 7: Perceived inconvenience of transit relative to auto and active transport modes was a major barrier to subsidy acceptance and to switching to transit commuting

Building on our analysis of factors that affect subsidy uptake and commute mode shift, in the second and third waves of the survey, we included two open-ended questions on the questionnaire that, once coded, provide insights into why some respondents did not take up the transit subsidy offered to them.[88] In the Wave 2 survey, we asked in question 4a why respondents who had a subsidy available to them did not accept it. In the third survey, question 4a asked respondents the same question and also to provide the reasons they did accept the subsidy. In both waves 2 and 3, the second question came at the very end of the questionnaire and provided an optional opportunity for respondents to offer any comments they wished on the questionnaire or their travel to work. Table 25 shows that the most commonly provided reasons for not taking up the transit subsidy reflected the perceived convenience of other commute modes over transit. The reason categories of "drive," "transit," "transit usage," and "active," all suggesting reasons for not accepting the subsidy that will not readily shift even if subsidy levels and terms were to change.[89] Parking was mentioned by only a small proportion of respondents (about 1%), but it is possible this sentiment was already implicitly included in the comments that we coded as "drive."

At the same time, "subsidy inconvenient" and "subsidy unavailable" were oft-cited reason categories and do suggest some room for increased subsidy acceptance through program (re)design, as previously discussed in connection with Finding 4. We return to this point in our discussion of the implications.

[87] See Table 268, Appendix K.
[88] See Appendix C for an explanation of our coding methodology.
[89] When respondents said they had not accepted the subsidy because they drove or were driven to work, we coded this as "drive." When respondents said they didn't use transit frequently enough to make the subsidy worthwhile, we coded that as "transit usage." When respondents said they walked or cycled to work, we coded that as "active." See Appendix C for more details on how we approached coding these questions.

Table 25: Reasons given for not accepting a subsidy

		Wave 2		Wave 3	
Reason	**Summary definition***	**% of respondents stating: My employer offers a transit subsidy but I have not taken it up**	**% of respondents**	**% of respondents stating: My employer offers a transit subsidy but I have not taken it up**	**% of respondents**
Drive	Don't take subsidy because they use auto	24.7	12.8	27.3	13.3
Parking	Don't take subsidy because parking is provided	0.8	0.7	1.4	0.6
Active	Assert that they walk, cycle or similar	8.7	4.5	11.5	5.2
Transit	Don't take subsidy because transit is not convenient	10.5	5.4	9.6	5.1
Transit schedule	Don't take the subsidy because of transit schedule	8.4	4.0	6.3	2.9
Subsidy unavailable	Subsidy is not offered to them or they are not eligible	12.2	6.2	8.0	6.6
Subsidy inconvenient	The way the subsidy is set up is a barrier	15.0	7.1	13.0	6.4
Transit usage	Do not use transit enough	16.4	8.1	17.1	8.6
Pass	They have another pass	3.4	1.8	2.4	1.4
Second job	Second job or other activities affects their use of a subsidy	1.4	0.6	0.2	0.2
Will take up	Intends to take up the subsidy	1.7	0.8	1.5	0.8
Uncoded reason	Other	4.9	2.4	8.5	6.8

* See Table 51, Appendix C for full definitions of each code.
Note: comments of an individual may be associated with more than one code, hence frequency does not add to 100%.
Wave 2 question: "If your employer offers a transit subsidy but you have not taken it up, why don't you? Please write in:"
Wave 3 question: "Why did you take up OR not take up the transit subsidy offered by your employer? Please write in:"

When the reason categories were combined with the applicable final comments categories (Table 26), it was even clearer that the perceived inconvenience of transit—contrasted with the convenience of other modes (driving and active)—was the dominant grounds for not accepting a subsidy.

Table 26: Reasons for not taking up a subsidy (question 4a or final comments)

	Wave 2 %		Wave 3 %	
Reason or Comment	**Respondents stating: My employer offers a transit subsidy but I have not taken it up**	**All respondents**	**Respondents stating: My employer offers a transit subsidy but I have not taken it up**	**All respondents**
Drive	27.3	14.8	28.8	14.7
Parking	2.7	1.9	2.6	1.3
Active	10.1	5.3	11.7	5.9
Transit	24.2	18.8	19.0	16.9
Transit schedule	14.3	10.2	10.7	8.6
Subsidy unavailable	12.6	6.6	8.0	6.6
Subsidy inconvenient	15.5	7.8	13.0	6.4
Transit usage	16.4	8.5	17.1	8.6

Note: comments of an individual may be associated with more than one code, hence frequency does not add up to 100%.
Wave 1 question: Not asked
Wave 2 question 4a: "If your employer offers a transit subsidy but you have not taken it up, why don't you? Please write in:"
Supplementary question at end: "If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:"
Wave 3 question 4a: "Why did you take up OR not take up the transit subsidy offered by your employer? Please write in:"
Supplementary question at end: "If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:"

However, reasons for not taking up the subsidy, combined with applicable final comments, vary importantly by hotel in one respect. In the hotel (D) that was the least conveniently located for SkyTrain commuters, 30% of respondents provided reasons or comments (to question 4a or in the final comments) related to driving. In other words, they did not take up the transit subsidy because they used an auto to commute at least some of the time. This level was almost twice that at the hotel with the next highest percentage of comments related to driving (14%). This indicates that both subsidy acceptance and transit use were influenced by lack of proximity to transit at the workplace, in addition to transit proximity to the place of residence.

In terms of positive reasons for accepting the subsidy, 42% of respondents who had taken up the subsidy commented that it provided them with "savings" (see Table 27).

Table 27: Reasons for accepting a subsidy (Wave 3)

Reason	Respondents stating: Yes, my employer offers a transit subsidy and I have taken it up %	All respondents %
Savings	42.3	15.5
Already commuting by transit	12.0	4.3
Process is easy	7.2	2.5
Other	10.0	3.8

Note: comments of an individual may be associated with more than one code, hence frequency does not add up to 100%.
Wave 3 question 4a: "Why did you take up OR not take up the transit subsidy offered by your employer? Please write in:"

Finally, Table 28 reports the frequencies for comments made in the final part of the questionnaire. More than 14% made a negative comment about transit, reinforcing the importance of perceived transit inconvenience in decisions about commute mode. Additional coding highlighted transit schedules (8%), capacity (4%) and operating hours (3%) as sources of this overall negative perception.

Table 28: Final comments

Final comment	Wave 2 %	Wave 3 %
Positive about transit	2.8	2.8
Negative about transit	14.6	12.9
Other comment	6.2	6.8
Drive	3.2	1.9
Parking	1.2	0.8
Active	1.1	1.3
Transit	14.5	12.4
Subsidy unavailable	0.3	0.0
Subsidy inconvenient	1.1	0.1
Transit usage	0.4	0.0
Transit schedule	7.5	6.2
Fare	1.2	0.7
Construction and maintenance	1.3	0.8
Traffic	1.1	0.2
Transit capacity	5.6	3.7
Transit late	3.0	2.0
Transit safety	0.8	0.5
Request for new or updated infrastructure	1.3	0.6

Note: comments of an individual may be associated with more than one code, hence frequency does not add up to 100%.
Wave 2 question: "If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:"
Wave 3 question: "If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:"

Finding 8: Those who were unlikely to shift commute modes in response to a transit subsidy had specific characteristics

We have so far established that the study population of hotel workers had high baseline levels of transit use and transit commuting, and that specific subgroups of these workers accepted the subsidy and switched to transit commuting at higher rates than others. Our analysis of the reasons for declining an available subsidy and the general comments provided about transit show that, overall, perceived inconvenience of transit is an obstacle to further growth of transit commuting among this group of workers. We will now turn our attention to identifying and understanding the downtown hotel workers who are unlikely to ever shift to transit (other things such as fuel prices and housing markets being equal), whatever the subsidy level. In doing so, we are responding to our various hypotheses about subgroups of our study population for whom a transit subsidy would have less or no effect on their commuting by transit (see Appendix B for those hypotheses).

Unsurprisingly, our analysis showed that the likelihood of using transit as part of the commute decreased for those who lived downtown, those who had a driver's licence or access to an auto, and those who had a longer commute by transit or had more transit segments in their commutes.[90] It makes sense that those who live close to work and are able to walk or bike (or roll) to work would prefer using active modes to taking transit, which costs more and is less flexible. Similarly, the longer and less convenient a commute is, the greater the time savings offered by auto-commuting, especially when the worker is already qualified to drive or has access to an auto.

To better understand the characteristics of those who are unlikely to shift to transit commuting regardless of subsidy level, we engaged in a multi-step analysis that relied on the findings from this study, and our multivariate analysis in particular, to create a predicted commute mode index. The first step in that process was creating a commute mode score, based on four factors for each commute mode, which are presented in Table 29. Note that the factors in the indices include both barriers and incentives for each mode. For example, we found that having two or more transit segments was a deterrent to taking transit, while having regular shifts during high transit service hours was an incentive to take transit. While we had many choices, we limited the number of included factors to four to aid in understanding and communicating the findings. We considered numerous other factors for inclusion, but rejected them because they either did not sufficiently differentiate likely mode choice, or because of lack of available data. An explanation of the factors we rejected can be found in our discussion of methodology in Appendix C.

For each of the four factors that was present for a respondent, we added one to the respondent's score, resulting in a final mode score between zero and four for each respondent.

[90] Table 86, Appendix F.

Table 29: Components of the commute score for each mode

Active mode	Transit mode	Auto mode
Male	Zone 2 residence	Have access to an auto
Downtown residence	No stops on commutes	Live in FSA with low frequent transit network (FTN) score
No children at home	Regular start and end times for shifts	Stop to make drop-offs on way to/from work
Non-regular shifts	Leaves home and returns between 6 a.m. and 9 p.m.	Two or more transit segments in commute

After creating a score for each commute mode for each respondent, we combined them to generate the predicted commute mode choice for each respondent—the mode each respondent was most likely to choose based on the factors we had identified. Again, we have explained the methods we used and decisions we made to arrive at this predicted mode in Appendix C. We then combined these predicted commute modes with actual reported modes to identify the minimum and maximum populations for each mode. This allowed us to identify the extent to which there is room for growth in transit-only commuting in this study population.

Actual versus predicted mode shares

Table 30 shows what the minimum and maximum predicted percentages were for each of the three main modes, for those with both single and mixed modes. The table includes data from all waves, pooled.

Table 30: Minimum to maximum predicted commute mode percentages versus actual percentages (all waves, pooled data)

Commute modes	Active %	Transit %	Auto %
Minimum predicted (single mode only)	11.7	30.6	6.3
Actual single mode	9.1	53.5	23.4
Actual single and mixed mode	11.5	66.5	35.9
Maximum predicted (single and mixed mode)	45.8	76.2	39.5

The results in Table 30 indicate the following:

- Hotel workers in our study used transit as a single mode almost twice as frequently as the minimum percentage we predicted (54% versus 31%), but they also made auto-only commutes at a higher-than-predicted minimum rate.
- With a maximum predicted share of 76%, it is unlikely that more than three-quarters of downtown Vancouver hotel workers could be transit commuters, whatever the subsidy level. With 67% of commutes involving transit, this suggests that the existing and experimental subsidies were effective in shifting transit commuting from an already high level close to the likely upper limit.
- There appears to be some room for growth in active commuting (with an approximately 35% difference between actual single and mixed mode active

commuting at 12% and the maximum predicted for those modes at 46%). Conversely, essentially all workers predicted as commuting by active-only (12%) are already doing so, and therefore we would not expect a higher subsidy to reduce active-only commuting. Note also that we did not count short walks to reach transit stops as active commutes in this analysis.

- The main scope for reduction in auto-only commuting lies in closing the gap between the actual (23%) and minimum predicted percentages of auto-only commuters (6%). Here levels of transit service, parking policies and promotion of ride-sharing may be more important than transit pricing in shifting behaviour.

Finally, looking at our quasi-panel of respondents for whom we were able to match survey responses from waves 1 to 3 (444 people), our analysis shows that 79% of these respondents did not change their commuting behaviour over this (March 2018 versus March 2019) period.[91] While this is a large percentage and may be a disappointing result in the context of the search for policy tools capable of effecting shifts to more sustainable commute modes, it is necessary to grapple with the underlying realities revealed: commuting is patterned behaviour, somewhat resistant to change.

Like any other policy tool, a transit subsidy has limits when it comes to its capacity to influence behaviour, and it's important to understand what those limits are. Our study has identified that while transit subsidies can shift the commuting behaviour of recipients toward transit, the effect in this case was relatively small, likely because of the existing high level of transit-involving commuting by hotel workers. As we identified in our predicted commute mode index, it's likely that some of the hotel workers who were not shifted to transit by the subsidy will not do so, regardless of the subsidy level, because, for example, they live either too far away or too close to work for transit commuting to be a viable or appealing option for them, at least given current levels of transit infrastructure, service and schedules. However, there may be scope for other policy measures to achieve further reductions in auto-only commuting.

Finding 9: Many new subsidy accepters were transit learners who used transit less intensively and somewhat less cost-effectively than existing transit users

We have noted that, overall, the reported increase in subsidy acceptance rate (6%) was higher than the increase in reported transit-only commuting rate (2%). The size of this disparity, which we observed in the survey data that included both workers with and without subsidies, was somewhat surprising to us. We expected new and enhanced subsidies to result in increased subsidy acceptance rates, and that transit usage would increase commensurately. While we expected that transit usage might increase more among certain subgroups, we did not expect to find, as our data shows, that new subsidy accepters used transit less intensively and somewhat less cost-efficiently than existing ones.

[91] See Table 65, Appendix E.

We can understand this better by looking at a decomposition of the change in subsidy acceptance by hotel, presented in Table 31. As the table shows, the total change in the share of employees accepting the subsidy (a 6-percentage-point increase overall) is apportioned to three groups: (1) people who accepted the subsidy and became new transit-only commuters; (2) existing transit-only commuters who accepted the subsidy; and (3) new subsidy accepters who did not commute only by transit. Note that this last group includes commuters who may have combined transit with other modes. For example, in Hotel A, which received an enhanced experimental subsidy, the 15% increase in the share accepting the subsidy is decomposed into a 7-percentage-point (net) increase in new subsidy accepters who became transit-only commuters, a 9-percentage-point (net) increase in subsidy accepters who were already transit-only commuters, and a 0.4% (net) decrease in subsidy accepters who were not transit-only commuters.

Overall, the share of new subsidy accepters accounted for by existing transit-only commuters accepting the subsidy was greater than the share accounted for by new transit-only commuters (5% versus 2%). This is especially apparent at hotels E and F, which received a subsidy for the first time after Wave 1. However, it is also the case that many subsidy accepters at Hotel F (2.7% + 14.5% = 17.2%), were not (yet) transit-only commuters when they accepted the subsidy. At hotels A and D, which received an enhanced subsidy on top of an existing subsidy, the change in the share of subsidy acceptance is equally accounted for by the new and existing transit-only commuters accepting the subsidy.

Table 31: Decomposition of change in subsidy acceptance by hotel, waves 1 to 3

Hotel	Subsidy treatment	Change in share accepting subsidy %	=	New transit-only commuters accepting subsidy %	+	Existing transit-only commuters accepting subsidy %	+	Subsidy accepters not commuting by transit only %
A	Subsidy increased 15% to 25%, then constant	15.3	=	7.2	+	8.5	+	−0.4
B	Subsidy fixed at 15%	−8.3	=	0.3	+	−4.9	+	−3.7
C	Subsidy fixed at 15%	−10.8	=	−11.5	+	−1.9	+	2.6
D	Subsidy increased 15% to 25%, then to 50%	11.7	=	8.2	+	6.9	+	−3.4
E	New subsidy at 15%, then constant	23.0	=	−2.4	+	20.8	+	4.6
F	New subsidy at 25%, then to 50%	55.5	=	2.7	+	38.2	+	14.5
G	No subsidy	n/a	=	n/a	+	n/a	+	n/a
All		**6.2**	**=**	**1.6**	**+**	**+5.0**	**+**	**−0.5**

Note: the three shaded row pairs highlight comparable hotel pairs.

The observed discrepancy between the increased rate of subsidy acceptance and transit-only commuting raises the possibility that the behaviour of the new subsidy accepters differs from that of the existing subsidy accepters. The aggregated data on Compass Card usage, which by definition only includes those who accepted the subsidy and hence enrolled in the CFO, provides insights that help explain this difference in behaviour.

TransLink provided us with monthly journey statistics for all Compass Cards that received a transit subsidy, aggregated by hotel, from January 2018 to April 2019, inclusive. To protect the privacy of users, TransLink could only provide this data for a minimum of 35 CFO enrollees at a hotel in a given month. We have complete sets of aggregated data for hotels A through D, and so this analysis focuses on them. To account for weather, service and other unrelated conditions, we were also provided with Compass Card usage data for a randomly selected comparison group. The comparison group consisted of 10,000 randomly selected adult monthly pass Compass Cards that had at least 20 journeys in a month that originated in downtown Vancouver. This data is discussed in more depth in Appendix C in the section on aggregated Compass Card data. Selected statistics for the hotels and comparison groups are included in Appendix G.

Transit subsidy "optimizers" and "learners"

We explored the source of the gap between the increase in subsidy acceptance and the increase in transit commuting through the related concepts of intensity and cost-effectiveness of use. One possibility, consistent with an idea that subsidy accepters optimize (but do not necessarily maximize) their transit use, is that a higher subsidy will attract existing but less frequent transit users. A transit optimizer is someone who matches their transit usage pattern to the pricing structure, so that they achieve the lowest cost per ride for their ridership pattern. At a higher level of subsidy, it becomes cost-effective for a transit optimizer to accept the subsidy (i.e., buy a monthly pass product), given their lower usage pattern. That is, while some of the new subsidy accepters may have been new transit riders, many could have been existing, infrequent transit users who were induced by the new or increased subsidies to change their mode of payment from stored value to a monthly pass. As "optimizers," we would expect these new subsidy accepters to be highly cost-effective in their monthly pass usage, and to be less intense transit users than existing monthly pass users.

Another possibility, consistent with an idea that transit users follow patterned behaviours that change slowly through learning, is that an enhanced subsidy is accepted by new and existing transit users as a "free" (to them) benefit, and that they then take some time to work out their (new) preferred pattern of transit use, as well as the various related behaviours and routines that enable those new commute preferences. A transit learner is someone who, in accepting a transit subsidy and a monthly pass, becomes open to experimenting with new and additional ways of using transit. These changes could include anything from the stops they make while commuting to whether they get or replace an automobile, to where they seek to live. It's also possible that buying a monthly pass may provide enough convenience and predictability benefits to transit users to make it worthwhile for them to purchase a monthly pass, even in cases where they don't break even on the cost of the pass. These new subsidy accepters would, like the optimizers, be

less intense transit users, but unlike the optimizers, they would be less cost-effective transit users (for some period). In the long run, "learners" will find a (new) level of transit use that suits them. Some may simply become optimizing lower frequency transit riders, while others would be induced by the subsidy to experiment with additional transit use.

The distinction between these two explanations is subtle and, in some sense, artificial: every transit user has learned to use the system, and when things change, they will recalibrate to achieve their (new) optimal level of use. Still, the distinction is important for transit planning and the structure of subsidies. The first explanation—that new subsidy accepters are engaged in financial optimization—lends less support to transit subsidies as a way of expanding transit mode share. The latter explanation—that new subsidy accepters are learning to use transit in new ways—lends support to transit subsidies as a potential way of expanding transit mode share through behaviour change, but with the caution that it will take time for the full consequences and results to manifest.

Our analysis lends support to the latter explanation—to the idea that many subsidy accepters are "learners," but does not preclude the idea that some subsidy accepters are "optimizers." The finding is not definitive, in part because the period that the experimental subsidies were available (six months to one year depending on the level of subsidy) could be too short to allow the full effects of behaviour change and adaptation to unfold, and because this study is limited in the range of variation observable. Recall again that this portion of the analysis focuses only on CFO enrollees at the four hotels that already had 15% transit subsidies and relatively high transit use before the study.

Intensity of Compass Card use

Table 32 presents the intensity of Compass Card use, measured by the mean (average) number of journeys per card per day for each study hotel and the comparison group in each survey month (March 2018, September 2018 and March 2019). From this we calculated the change in the mean from March 2018 to March 2019. We estimated the 95% confidence interval of the change in the mean for the comparison group, but not for each of the hotel groups.[92] At the two hotels that received enhanced subsidies (A and D), we noted statistically significant drops in the mean journeys per card per day relative to the comparison group, which essentially had no change. At hotels A and D, the mean number of trips per day fell 0.188 and 0.148 respectively.[93]

Our closer analysis of the data (not shown in Table 32) showed that most of that decline took place during regular hours, and especially among journeys ending downtown during regular hours. This suggests that the new subsidy accepters (i.e., those who received subsidies by enrolling in the CFO after March 2018) were less intense users of transit than the existing CFO enrollees (as of March 2018), and they were especially less likely to use

[92] These are based on a 100% "census," not a sample, of those receiving the subsidy at each hotel.
[93] To interpret this, consider the following scenario: following a subsidy increase, you have twice as many cards in the subsidy pool, and you observe a 0.1 decrease in the mean number of journeys per day. That means the new cards take an average of 0.2 fewer journeys per day than the existing cards, everything else remaining the same. That translates into one fewer journey by transit per working week per card.

transit to get to work. This is consistent with our survey findings of a smaller increase in transit-only commuting than in subsidy acceptance.

The decline in intensity of Compass Card use at hotels A and D was also negative in absolute terms. Further, the timing of the decline is consistent with the roll-out of the enhanced subsidy. At Hotel A, most of the decrease happened by September 2018, which coincided with a change from 15% to 25% in May 2018 and a constant subsidy thereafter. At Hotel D the intensity of use fell in two steps, mirroring the increases in subsidy first from 15% to 25% in May 2018, and then to 50% announced in October 2018.

In contrast, at hotels B and C, which did not receive enhanced subsidies, we saw no change relative to the comparison group. At these hotels and for the comparison group, the intensity of use increased from March 2018 to September 2018, which was likely a seasonal effect. From March 2018 to March 2019, there was essentially no change in the intensity of monthly pass usage at these two hotels, as measured by the mean number of journeys per card per day.

This suggests that those employees who were drawn to accept the enhanced (25% or later, 50%) subsidies were less intense transit users than those who had already accepted the existing (15%) transit subsidies. The observed decrease in the intensity of transit usage is expected when either “optimizers” or “learners” accept a new or increased subsidy. Evidence in the next subsection on the cost-effectiveness of card usage (in combination with results discussed elsewhere, especially findings 3 and 8), lends support to the idea of learning in the form of a delayed change in commuting behaviour following subsidy acceptance.

Table 32: Intensity of Compass Card use, selected study hotels versus comparison group

Hotel	Subsidy treatment	Mean journeys per card per day				
		March 2018	Sept. 2018	March 2019	Change: March 2018 to March 2019	Change: hotel relative to comparison group
A	Subsidy increased 15% to 25%, then constant	1.717	1.537	1.530	−0.188	Below comparison group
B	Subsidy fixed at 15%	1.407	1.480	1.404	−0.003	Same as comparison group
C	Subsidy fixed at 15%	1.487	1.632	1.505	0.019	Same as comparison group
D	Subsidy increased 15% to 25%, then 50%	1.559	1.524	1.411	−0.148	Below comparison group
Comparison group		**1.793**	**1.849**	**1.799**	**0.006 (−0.025 to 0.037)***	

Source: the research and analysis are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.
* 95% confidence interval of mean difference.

Cost-effectiveness of Compass Card use

Evaluating the cost-effectiveness of monthly Compass Pass product use provides additional insight regarding changes in commuting behaviour. We asked TransLink to calculate the proportion of Compass Cards that had "broken even" in a month, using actual travel behaviour, the applicable subsidy levels, and the prices that took effect on July 1, 2018. We considered financial break-even to have occurred when the cost of the monthly pass product associated with a card, plus any added fares, was less than or equal to the cost of the same journeys based on stored-value fare rates. For example, a customer who lived and worked in the City of Vancouver in 2018 and who had a standard adult one-zone monthly pass (costing $95) that they used only to commute to and from work would have reached the break-even point on the cost of that pass if they used it to commute 21 days in a month instead of paying $2.30 for each of those trips using stored value. If the customer also used the pass to make additional (non-work) trips, they would have reached that break-even threshold with even fewer commute journeys. If that customer was a hotel employee who had a subsidized pass, then their break-even point would also be lower.

Table 33 shows that for the period March 2018 to March 2019, the percentage of Compass Cards that achieved the break-even point declined at the subsidy-enhanced Hotel A by 7.5%. In contrast, the percentage of subsidy accepters at Hotel B that broke even increased by 5.7% (and by 2.1% in the comparison group) over the same period. With both a persistent reduction in the intensity of use and a persistent reduction in the cost-

effectiveness of use, the behaviour of the new subsidy accepters at Hotel A is consistent with the notion that the subsidy enhancement (15% to 25%) induced new people who were still working out how to make the best use of transit to accept the subsidy. In other words, they were "learners."

However, the picture is different at Hotel D, which saw two separate experimental increases to its subsidy. At Hotel D, the percentage of cards that broke even increased overall by about the same amount as it did at Hotel C (6.2% versus 5.1%), where the existing 15% subsidy did not change. Further, most of that increase in cost-effectiveness at Hotel D occurred between September 2018 and March 2019, following the second rise in subsidy level (from 25% to 50%). This pattern of decreased intensity of use but absolute (though not relative) increased cost-effectiveness of use is consistent with the notion that the 50% enhanced subsidy induced some low-intensity "optimizer" transit users to accept the subsidy.

Table 33: Cost-effectiveness of Compass Card use

		Percentage of cards breaking even at subsidy level (15%, 25% or 50%)			
Hotel	**Subsidy treatment**	**March 2018**	**Sept. 2018**	**March 2019**	**Change: March 2018 to March 2019**
A	Subsidy increased 15% to 25%, then constant	92.9	89.7	85.4	−7.5
B	Subsidy fixed at 15%	71.4	80.0	77.1	5.7
C	Subsidy fixed at 15%	76.2	79.6	81.3	5.1
D	Subsidy increased 15% to 25%, then 50%	80.0	81.4	86.2	6.2
Comparison group	**No subsidy**	**86.3**	**84.8**	**88.5**	**2.1**

Source: the research and analysis are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.

It is possible that the differences we observed with regard to cost-effectiveness at hotels A and D simply reflect the relative sizes of the subsidy increases. Perhaps the smaller subsidy increase at Hotel A induced subsidy accepters who had not (yet) worked out how to use their passes optimally, whereas the larger subsidy increase at Hotel D made it easier for the users to achieve the new, lower, break-even point. We have no way of knowing how these commute behaviours, and particularly the intensity of use, may have evolved further if the experimental enhanced subsidies had continued.

A final insight from the aggregated Compass Card data was provided by analysis of the changes in daily usage patterns on weekdays and weekend days, excluding statutory

holidays. We would expect a travel pattern that is cost-effectively using a monthly pass product for commuting to include several days with two journeys (i.e., to work and back home). Conversely, if new subsidy accepters were less cost-effective than existing enrollees, then we would expect to see a decline in the proportion of enrollees making two journeys per day.

Comparing the data only for March 2018 and March 2019 (Table 34), we found that at hotels A and D, the two hotels with an increased subsidy, there was a decline in the average proportion of enrolled Compass Cards that made two journeys on weekdays, with a corresponding increase in the proportion of cards making zero journeys per day. In contrast, the proportion of enrolled Compass Cards making two journeys increased at both hotels B and C, while staying essentially constant in the comparison group. This may mean that people who transitioned to accepting the subsidy and enrolled in the CFO were not yet using the pass cost-effectively: many were still "learners."

Table 34: Change in the average proportion of journeys per day on weekdays, between March 2018 and March 2019

		Journeys per weekday %			
Hotel	**Subsidy treatment**	**0**	**1**	**2**	**3+**
A	Subsidy increased 15% to 25%, then constant	6.6	1.9	−5.6	−2.8
B	Subsidy fixed at 15%	−3.0	0.1	4.3	−1.4
C	Subsidy fixed at 15%	−4.9	−0.9	6.7	−0.9
D	Subsidy increased 15% to 25%, then 50%	9.0	2.0	−9.9	−1.2
Comparison group	No subsidy	0.2	0	−0.3	0.1

Source: the research and analysis are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.

Since over half of hotel workers work on weekends, it is also important to consider commuting on weekend days. Our analysis of two-journey usage on weekend days did not provide such a clear-cut result (see Table 35). The average proportion of enrolled cards making two journeys per day on weekends rose slightly at the subsidy-increase Hotel D, but it declined at the other three hotels, and declined by the most at the other subsidy-increase Hotel A. This pattern is consistent with our finding that subsidy accepters at Hotel D were more cost-effective than those at Hotel A. However, we are cautious about how far we can take this interpretation because it is likely that travel behaviours on weekends are complicated by off-peak pricing and the variable demands of weekend travel (for example, banquet servers may work so late that they cannot get home on transit). Others may want to meet friends before or after work.

Table 35: Change in the average proportion of journeys per day on weekend days, between March 2018 and March 2019

		Journeys per weekend day %			
Hotel	**Subsidy treatment**	**0**	**1**	**2**	**3+**
A	Subsidy increased 15% to 25%, then constant	6.9	2.2	−11.8	2.7
B	Subsidy fixed at 15%	2.0	2.1	−3.7	−0.4
C	Subsidy fixed at 15%	5.6	−0.5	−4.1	−1.0
D	Subsidy increased 15% to 25%, then 50%	3.9	−4.9	1.6	−0.6
Comparison group	No subsidy	−0.8	0	0.5	0.2

Source: the research and analysis are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.

In general, we argue that the evidence in this finding is consistent with the notion that many new transit subsidy accepters were learning and adapting to the transit system, without precluding the idea that subsidy accepters are also optimizers.

Finding 10: Lower parking prices were associated with more auto commuting

Through our interviews with hotel management, we learned that parking infrastructure and practices varied widely among the study hotels. In particular, some of the hotels owned their own parking lots, which provided them with a source of revenue and allowed them more control over employee parking rates. Hotels that owned their own parking also rented non-subsidized spaces to guests and/or the general public on an hourly, daily, weekly or monthly basis. The hotels that didn't own the lots where their guests and employees park instead obtained those spaces from their property owners or managers. In Appendix J, we summarize what we learned about both on-site parking arrangements at each hotel and parking availability and costs in the areas surrounding each hotel.

In the wave 2 and 3 surveys, we asked those who commuted by auto (whether as drivers or as passengers) to recall how much they paid or contributed for parking on the reference-to-home day. As reported in Table 260 in Appendix K, auto commuters paid or contributed an average of $4.04 per day or $44.59 per month. Daily rates ranged up to $50 per day, while monthly rates ranged up to $350 per month. It is, however, important to note that the average includes all those who paid nothing for parking, whether because they were a passenger or a beneficiary of workplace parking. These "free parkers" represent just 50% of auto commuters.

In response to interest in this topic from study partners, after the first wave of the survey was complete, we collected public parking data in the area surrounding each hotel to help us understand how availability and prices might influence workers' transportation choices. Our parking survey included the block containing the hotel and eight blocks surrounding it. For each of these blocks, we collected data on the availability of both street and parkade parking, as well as the price of that parking at different times of day and for different lengths of time. Table 36 summarizes the results of that survey (see also Appendix J).

While we collected and considered data on a variety of parking metrics, we concluded that total parking lot spaces and the weighted average of the monthly price of parkade parking

were the most straightforward indicators to measure parking availability and price for downtown hotel workers.[94] We chose monthly parking price as the main price indicator because it is the cheapest option that meets the needs of hotel employees driving to work regularly and also offers some security advantages over street parking. Also, in terms of commuting decisions, monthly parking is most directly comparable to a monthly transit pass. At the same time, the availability of parking spaces overall, and the price of hourly, daily and overnight parking, may certainly influence commute decisions.

Metered street parking was often the cheapest hourly option, but it is usually only available for two to three hours, which is shorter than the minimum allowed shift under BC's labour laws. Collecting data on metered street parking contributed to our understanding of the overall background of parking availability in the hotel areas, even though it is unlikely that metered street parking is a viable option for most commuting hotel workers.

Table 36: Public parking availability and price summary by hotel

Parking profile indicators	A	B	C	D	E	F	G
Total spaces in parking lots	3,359	5,572	3,619	965	1,161	1,007	606
Total number of lots	11	17	12	5	11	12	9
Total lots open overnight	4	7	7	1	4	5	5
Total metered street parking spaces	59	261	312	86	256	266	297
Monthly price,* parking lots	$272.03	$271.51	$279.71	$100.65	$190.47	$164.47	$174.32
Daily price,* parking lots	$22.10	$24.60	$24.88	$20.99	$10.89	$15.12	$14.65
Hourly price,* parking lots	$7.02	$7.87	$8.27	$6.36	$5.07	$6.20	$5.98
Evening price,* parking lots	$8.78	$9.16	$10.72	$4.92	$6.56	$9.65	$12.26
Hourly price,* daytime street parking	$6.21	$5.58	$5.57	$1.60	$2.91	$2.45	$1.91
Hourly price,* evening street parking	$5.96	$4.68	$5.08	$1.00	$3.35	$1.57	$1.47

* All prices reflect the weighted average for lot parking prices within the hotel area.

Reflecting on this data, as well as the well-established negative correlation between transit commuting and parking availability and pricing, we observed the following:

- Both availability and price of parking varied greatly by hotel.
- Monthly parking prices were somewhat, but not perfectly, related to daily, hourly and evening prices.
- Lot parking was most available in Hotel B's area (5,572 spaces) and least available at hotels D (965 spaces) and G (606 spaces). Using the number of spaces as a measure of availability does not take the demand for those spaces into account.
- Monthly parking was the cheapest in the area of Hotel D, at an average cost per space of $100.64 per month, which is a little more than a third of what it cost in the

[94] Further details on our methodology, definitions and criteria can be found in Appendix C, and additional parking data tables for each hotel can be found in Appendix J.

most expensive area, around Hotel C ($279.71). Hotels A and B also had similarly high monthly parking rates at $272.03 and $271.51, respectively.

Table 37 presents the relationship between public parking availability and pricing in the areas surrounding the hotels and auto-only commuting. In general, we found that the total number of spaces in these surrounding areas was not directly correlated with auto-only commuting. This was not a surprise, since there were multiple parking structures and options close to the hotels in the core business areas. Auto-only commuting appears to be more closely related to monthly parking prices.

Table 37: Relationship between public parking availability and auto-only commuting

		Public parking indicators		Auto-only commuting		
Hotel	**Subsidy treatment**	**Total spaces**	**Monthly price***	**Wave 1 %**	**Wave 2 %**	**Wave 3 %**
A	Subsidy increased 15% to 25%, then constant	3,359	$272.03	8.7	8.6	6.5
B	Subsidy fixed at 15%	5,572	$271.51	14.8	13.8	14.0
C	Subsidy fixed at 15%	3,619	$279.71	12.3	16.7	19.2
D	Subsidy increased 15% to 25%, then to 50%	965	$100.65	48.1	49.4	42.3
E	New subsidy at 15%, then constant	1,161	$190.47	21.1	26.6	24.4
F	New subsidy at 25%, then to 50%	1,007	$164.47	29.3	25.7	24.5
G	No subsidy	606	$174.32	30.4	25.9	27.6

Note: the three shaded row pairs highlight comparable hotel pairs.
*As of when we conducted our parking survey in October and November 2018.

Finding 11: Those who used transit or accepted the subsidy were more likely to report improvements in quality of life, including in their physical health, level of stress and commute predictability, in contrast with overall reports of small declines in quality of life

What are the effects of different levels of transit subsidy on different aspects of quality of life such as stress levels, happiness at work and overall happiness, among other indicators? We hypothesized that the hotel workers who increased their transit use in response to the experimental subsidies would experience (and report) improvements in these quality-of-life indicators. We gathered data on these topics by including eight quality-of-life indicators with a five-point Likert-type scale in all three questionnaires.[95]

[95] See Appendix D for all three versions of the questionnaire.

What we found was that overall, for our entire study population, respondents reported small declines in perceived quality of life in most categories from waves 1 to 3 of the surveys. This tells us that any subsidy- or transit-related improvements in how workers perceived their quality of life were not large enough to override the overall (small) declines in perceived quality of life. After all, a new transit subsidy, or an increase to an existing transit subsidy, is only one of many factors affecting workers' perceptions of their quality of life.

We do note in Table 38, however, that there were absolute improvements to these indicators in two areas that may be closely related to commuting: stress level (+3.1%) and predictability of commute (+8.2% and +3.5%). Two of the factors that influence the degree to which people find commuting unpleasant and stressful are uncertainty about the length of time the commute will take and uncertainty about what will happen on the way. For example, unpredictability is a challenge for auto-only commuters in areas with traffic congestion, just as it is for transit commuters in areas with unreliable service.

In contrast, respondents reported an overall absolute decline in all other dimensions of quality of life, including general happiness with life, time spent with family and friends, physical health, shift scheduling and general happiness with work. Our analysis showed that the relative decline in some of these was smaller for those who accepted the subsidy and/or used transit.

Table 38: Perceived quality of life, waves 1 and 3 and index of quality of life

	Wave 1 %					Wave 3 %					Index of QoL change[96]
	Very pos.	Pos.	Neut.	Neg.	Very neg.	Very pos.	Pos.	Neut.	Neg.	Very neg.	
General happiness—life	36.6	49.6	12.5	1.2	0.1	33.5	47.0	17.9	1.1	0.5	−9.5
Time spent with family/friends	37.1	42.8	16.2	2.7	1.2	33.1	42.2	19.9	4.1	0.7	−9
Physical health	23.7	50.2	20.8	4.6	0.6	20.4	47.4	27.4	4.2	0.5	−8.8
Level of stress	8.3	26.8	48.4	14.5	1.9	9.4	28.8	44.6	15.0	2.2	3.1
Commute predictability—to work	17.8	45.3	28.6	6.3	2.1	20.2	44.5	30.1	4.1	1.1	8.2
Commute predictability—to home	16.8	46.9	27.4	6.7	2.1	18.7	43.7	30.6	5.8	1.1	3.5
Shift schedule(s)	21.4	42.8	29.1	5.6	1.0	18.6	44.0	28.4	7.2	1.7	−7.4
General happiness—work	19.5	51.9	25.0	3.1	0.5	19.2	43.8	30.2	5.8	1.1	−12.6

Through our analysis, which allowed us to examine the effects of individual variables, we found that a positive or very positive rating of "general happiness with life" was directly related to transit use, for the entire study population.[97] This was the only positive quality-of-life rating directly related to transit use, but there were other positive outcomes associated with subsidy acceptance. We note here, however, that acceptance of the subsidy does not (necessarily) equal increased transit use, because these hotel workers may already have used and commuted by transit. That said, for the entire study population, subsidy acceptance was correlated with positive perceptions of health, stress and commute predictability.[98] In other words, accepting the subsidy appeared to improve workers' general sense of assuredness about their lives.

Further, workers who had the existing 15% transit subsidies in the first wave of the survey (i.e., eligible unionized workers at hotels A, B, C and D who had accepted the subsidy) were more likely to have either unchanged or improved quality-of-life indicators from waves 1 to 3 compared with those who had no subsidy in Wave 1 of the survey (i.e., all workers at hotels E, F and G and workers who had declined or were ineligible for the subsidy at hotels A, B, C and D).[99] The unchanged or improved quality-of-life dimensions were correlated with subsidy acceptance, including general happiness with life, time with family and friends, and predictability of commute.

[96] We calculated the index of quality of life change as Wave 3 net change (twice "very positive" plus "positive" minus twice "very negative" minus "negative") minus Wave 1 net change.
[97] See Table 92 (binary logistics regression 2a1) in Appendix F. This was for the pooled data of all three survey waves.
[98] For health and stress, see tables 93 and 94 (binary logistics regressions 2a3 and 2a4) in Appendix F. For commute predictability, see tables 95 and 96 (binary logistics regressions 2a5 and 2a6) in Appendix F. These all pertain to the pooled data of all three survey waves.
[99] See tables 97, 98, 100 and 101 (binary logistics regressions 2b1, 2b2, 2b5 and 2b6) in Appendix F.

Turning to the quasi-panel of 444 respondents matched from waves 1 to 3, we found that 47% of those who added transit to their commutes reported improvements in their stress levels from waves 1 to 3 of the survey versus only 30% who reported this improvement among those who did not add transit to their commutes.[100] Also, among those who switched to transit-only commuting from waves 1 to 3, 93% reported constant or improved stress levels. For those who stopped being transit-only commuters from waves 1 to 3, only 68% reported this about their stress levels.[101] Regression analysis of the quasi-panel data lends further indirect support to this finding: those who accepted the subsidy experienced a statistically significant improvement in their level of stress.[102]

Overall, 25% of these quasi-panel respondents reported a decline in happiness at work, but among those who switched away from commutes that included transit, this rate was a much higher 50%. Meanwhile, only 19% of those who added transit to their commutes reported a decline in their happiness at work. This data suggests that those whose commutes included transit were more likely to have stable or improved feelings of happiness at work than those who commuted by other modes.

Taken together, the data in this section supports the finding that those who used transit, switched to transit or accepted the subsidy over the course of this study were more likely to report relative improvements in selected quality-of-life indicators than those who were auto-only commuters, those who switched away from transit and those who were not eligible for or did not accept the transit subsidy. The dimensions in which relative quality-of-life improvements were most apparent were physical health, level of stress and commute predictability.

Finding 12: TransLink's Compass for Organizations program was easy to implement for employers, which supported their participation in the program

When we began this study, we had some hypotheses about the effect that the experimental subsidies would have on the hotels as workplaces (see Appendix B). We thought that the increased use of transit resulting from the subsidies would improve employees' performance and the ability of employers to recruit qualified candidates, reduce turnover, lateness and missed shifts, and stimulate changes in workplace practices. For the most part, our predictions were neither confirmed nor refuted, and it did not prove feasible for us to separate the effects of the experimental subsidy from the myriad other factors influencing workplaces. This is partly because when we developed these hypotheses (before the Wave 1 survey), we did not know what the baseline level of transit use for commuting was at the study hotels. Now that we know that 54% of our study population was commuting by transit at the time of our baseline survey (though with considerable variation by hotel), it does not surprise us that an increase in that overall rate to 56% did not provoke lasting or discernible changes to workplace practices or the various human resources indicators for which we collected data from the hotels (e.g., performance, lateness and absenteeism).

[100] See Table 78, Appendix E.
[101] See Table 80, Appendix E.
[102] See Table 99 (binary logistics regression 2b4), Appendix F.

In our interviews with both hotel management and union representatives, we frequently heard about the challenges of recruiting qualified workers in a climate of labour shortage. Management at the hotels that offered the transit subsidy said they perceived the subsidy to be an appealing incentive for prospective employees, but it was not possible to track the effect of the subsidy on recruitment because it was not possible to isolate it from the rest of the compensation package and from other factors influencing workers' decisions to seek out or accept employment at the hotels. Similarly, when we asked managers about the data on absenteeism, lateness, grievances and disciplinary actions that we had requested they collect, they told us that the patterns in the data mainly followed seasonal ebbs and flows. Where it varied, they identified other factors as the cause, not the transit subsidy. There were no cases we know of where the transit subsidy was the subject of a grievance or disciplinary action.

It's likely that the ease of administrating the transit subsidies was another reason that they were smoothly integrated into the workplaces where they had not previously existed, without causing or necessitating major changes to workplace structure. At the outset of the study, several human resource managers and union members had expressed concern about the roll-out of TransLink's CFO program. These concerns included the administrative burden of implementing a new system, the time frame for subsidy enrolment, and that employees might not like converting from a reimbursement-based system to an advance payroll deduction system. However, the feedback we received from hotel management was highly positive. Human resource managers in particular reported that TransLink's CFO system was easy to administer once set up: it required no paperwork from individual employees once they had confirmed their intention to enrol in a given month, and there was no requirement to audit employees' expense claims. Furthermore, the CFO program provided employers with a dedicated TransLink contact point, as is their normal practice.

Certainly, providing transit subsidies adds to employers' administrative burden and costs (in addition to the cost of the subsidies themselves). We did hear, especially from management at hotels where the subsidies were newly introduced, that there was time involved in responding to enrolment requests, lost Compass Cards and questions about eligibility. In some cases, management told us that they would handle their administration of the subsidy differently if they were paying the costs themselves, or if the experimental subsidies were to be permanent. Overall, however, hotel management seemed to find the CFO program user-friendly and easy to manage.

The experimental subsidies, then, seem to have been low-impact administratively and in terms of their effects on recruitment, lateness, absenteeism, grievances and disciplinary action. Again, this lack of measurable impact on workplace structures and human resource indicators is in the context of a population where for the majority, commuting by transit was already the norm.[103] Based on the experience with these hotels and this group of workers, we believe that, depending on the baseline level of transit commuting, offering a

[103] It's also the case that there were variations among the hotels in how they managed and collected their human resources data—in some cases tracking it centrally and in other cases by department or through external agencies—so making hotel-to-hotel comparisons was not strictly feasible. See Appendix C for more details on our methods for the organizational interviews and the human resources data we collected from hotels. See Appendix I for short hotel profiles.

transit subsidy of 15% to 50% may not result in improvements human resources indicators such as lateness and absenteeism, we know from our analysis of our quality-of-life data that workers receiving the subsidy did benefit. When a system like TransLink's CFO program is in place, employers can achieve these benefits, as well as a potential savings in what they pay for employees' parking, with a low administrative burden and minimal impact on their workplace policies and procedures.

Conclusions and implications for stakeholders

The employer-paid transit subsidies that we studied are a net benefit to employers, transit-riding employees, and TransLink, while at the same time supporting various of the City of Vancouver's transportation, environmental, economic and equity-enhancing policy objectives. The employer-paid transit subsidies are paid for by a redistribution of total employee compensation toward those employees who accept the transit subsidy. At the same time, we have identified various tangible benefits from the increased transit commuting.

In this brief section we reprise the argument and evidence that led us to this conclusion, and then highlight the implications for the stakeholders that flow from the 12 findings.

Conclusions

In 2015, management at selected downtown Vancouver hotels and employees represented by Unite Here Local 40 agreed that a 15% transit subsidy should form part of the overall compensation package of represented employees. We estimate that each subsidy accepted by a worker cost about $18 per employee per month, based on the 15% subsidy, the mix of zone products purchased and the 2018–9 monthly pass price. In the absence of the negotiated transit subsidy, almost all this amount would have been paid to employees in some other form. We say "almost all" because the transit subsidy may have imposed slightly higher administrative costs than simply paying higher wages (although the CFO's payroll deduction system has reduced these costs), and with such a transit subsidy, the employer does face some uncertainty in the number of employees who will accept it (although this study has helped to reduce that uncertainty). It is, however, unlikely that the transit subsidy would be passed on to consumers in the form of higher prices for services and products offered by the hotels, because the subsidy has such a negligible net impact on the cost of employee compensation.

We do not think that there are other significant costs associated with an employer transit subsidy. For instance, while it is conceivable that a wide-scale rollout of employer transit subsidies might trigger the need for additional transit capacity, this would be accompanied by increased transit fare revenue and reduced need for non-transit infrastructure.

Instead, the employer transit subsidy is paid to those employees who accept the subsidy, out of the forgone compensation of those employees who do not. It should be noted here that all employee benefits, including the provision of subsidized auto or bicycle parking, entail a redistribution of total compensation among employees who accept or decline these benefits. This study has shown that subsidy acceptance rates vary considerably from workplace to workplace according to factors such as the convenience and level of service of transit at the commute destination, the price and availability of parking, and the regulations governing subsidy eligibility. Based on observed subsidy acceptance rates (see Table 15) and the odds ratio of subsidy acceptance (see tables 84 and 91), we estimate subsidy acceptance rates of 15% to 40% at the 15% subsidy level, 25% to 45% at the 25% subsidy level, and 35% to 55% at the 50% subsidy level.

The size and distribution of the benefits of these employer-paid transit subsidies also vary depending on the extent to which the subsidies induce new transit ridership. Our global aggregate estimate is that about one-quarter (1.6% out of 6.2%; see Table 31) of those accepting a transit subsidy were new transit commuters, but as previously noted, this may vary widely from workplace to workplace depending on a variety of factors. For instance, our study shows that a new 50% subsidy at a workplace close to transit and with an already high level of transit ridership resulted in fewer new transit riders than did a subsidy enhanced to 50% at a workplace with lower transit accessibility and ridership.

Our estimated proportion of new transit commuters (25%) is higher than Rivers and Plumptre's estimate that 3% to 9% of those accepting the 15% Canadian Public Transit Tax Credit were new transit riders.[104] This is to be expected for a variety of reasons. Our study was conducted on a population that works in the best transit-served part of the region, whereas their analysis included all work locations. And, unlike the financial benefits of a tax credit which only accrue when claimed annually, the financial benefits of these employer-paid transit subsidies were immediately apparent.

Based on our estimate that one-quarter of those accepting the employer transit subsidy are new transit commuters, we estimate that a 15% subsidy may induce between 4% (3.75%) and 10% of employees to become new transit commuters. A 50% subsidy level may induce between 9% (8.75%) and 14% (13.75%) of employees to become new transit commuters. The benefits of this increase in transit commuting include the following:

- contributing to achieving the City of Vancouver's transportation, environmental and equity policy goals,
- increasing TransLink ridership, as well as increasing the share of transit riders using monthly passes, and
- reducing the demand on hotel employers for parking, as well as improving employee reports of improved commute predictability.

The study has established that engagement with transit has some quality-of-life benefits for employees, most notably with respect to reduced level of stress. There is also evidence that the transit subsidy entails an equity-enhancing redistribution of compensation toward those who are more dependent on transit for commuting. And our evidence provides support for the notion that transit subsidies encourage employees to experiment with their monthly passes, learn how use the transit system to best advantage, and through this process gain transit competency.

At the same time, it is important to remember that all the identified benefits of an employer-paid transit subsidy accrue within the existing structural conditions that shape transportation outcomes. These range from the reach and service levels of the transit system to the price of gasoline, and from unaffordable housing to the workplace demands of the tourism industry. Transit subsidies help, but they have their limits.

[104] Nicholas Rivers and Bora Plumptre, "The Effectiveness of Public Transit Tax Credits on Commuting Behaviour and the Environment: Evidence from Canada," *Case Studies on Transport Policy* 6, no. 4 (2018): 661, https://doi.org/10.1016/j.cstp.2018.08.004.

Our findings thus support the need for further collaboration and policy advocacy by workers, employers and governments. For instance, the City of Vancouver, Metro Vancouver and TransLink have all endorsed and are striving to implement policies to encourage and create more rental housing in transit-oriented locations, based on both the need for more rental housing and on renters' high rate of transit usage.[105]

Implications

Finding 1, "These hotel workers were highly engaged with the transit system," underscores the importance of transit to tourism workers, and likely also to other service workers, in the metropolitan core. Transit usage among these hotel workers was high before the study introduced new and enhanced transit subsidies.

Finding 2, "Some workers remained unaware of the transit subsidies throughout the study period," implies that subsidy providers, with the assistance of transit authorities, might alleviate this problem through increased communication efforts to make employees aware of the subsidies.

Finding 3, "As the transit subsidy level increased, subsidy acceptance increased overall and was also higher among specific groups of workers," implies that higher transit subsidies are likely to be equity-enhancing.

Finding 4, "Eligibility, together with financial and administrative barriers, prevented some workers who were regular transit users from accessing and accepting the subsidy," implies that subsidy uptake and hence transit use may be increased by modifying qualification and enrolment rules.

One way to do this would be to reduce, relax or eliminate the current one-year qualifying period. Starting a new job often entails creating new work-related routines. It's more likely that transit commuting would be one of them if the subsidy were available from the start of employment or after a short probationary period, rather than after a full year, when work routines may have been well-established.

We recognize various cultural and administrative concerns with this proposal, such as that the employer-paid transit subsidies are currently understood as a benefit for permanent employees, and turnover is higher in the first months of a new job. We also recognize that in some jobs, employees start part-time or on call. We believe that these administrative concerns could be addressed by retaining a qualifying period for the benefit (as is typical for other benefits) but shortening that period to no more than three months. It might also be possible to require that an employee has worked a minimum number of hours in the three months before signing up for the subsidy.

Subsidy uptake and transit use may also increase if eligible employees are allowed to join or leave the transit subsidy program on a monthly basis, as long as they indicate their preference a month in advance. Some of study hotels currently require employees who are

[105] Metro Vancouver, "Transit-Oriented Affordable Housing Study," http://www.metrovancouver.org/services/regional-planning/housing-affordability/transit-oriented/Pages/default.aspx. See also, City of Vancouver, "Housing Vancouver Strategy, 2017, 31–32, https://council.vancouver.ca/20171128/documents/rr1appendixa.pdf.

eligible for the subsidy to commit to participation in the payroll deduction for six months at a time, and only open enrolment twice per year. While managing the turnover in the subsidy program creates an administrative burden, it is much less so now that the CFO program is set up through payroll deductions rather than paper-based reimbursements.

Furthermore, allowing employees to sign up for a subsidized monthly pass for fewer zones than is required by their zone of residence might reduce acceptance barriers. Some of the study hotels require that an employee who lives in zone 2 or 3 pay for a monthly pass that matches their recorded zone of residence, even if that employee might wish to pay for only a one- or two-zone pass. For employees who live close to the borders of zones, or who regularly work off-peak hours, buying a pass for fewer zones may make more financial sense. Allowing employees to "down-zone" their pass purchase might encourage them to participate in the subsidy program and allow them to save money. It costs the employer less to subsidize a monthly pass for fewer zones, so the only reason not to offer this option is the incremental effort required to ask employees their preference when signing up for the subsidy rather than automatically assigning it based on their location. We believe that providing employees with this flexibility is worth the time required and would encourage transit use and commuting.

Finding 5, "Transit commuting increased overall, and it increased more at the hotels where the experimental transit subsidies were available than at the hotels where they weren't," implies that hotel management and Unite Here Local 40 should maintain the pre-existing employer-paid 15% subsidies and discuss how, in view of their shared commitments to environmental sustainability, those subsidies could be increased.

Finding 6, "Specific subgroups of workers were more likely to commute by transit and were more likely to change their commute with the subsidy," implies that governments at various levels might explore how transit subsidies for low-income workers could contribute to the achievement of their anti-poverty, equity and environmental sustainability goals, where those goals are shared and overlap.

Finding 7, "Perceived inconvenience of transit relative to auto and active transport modes was a major barrier to subsidy uptake and to switching to transit commuting," implies that there are limitations on what transit subsidies alone can achieve to increase the transit mode share.

Finding 8, "Those who were unlikely to shift commute modes in response to a transit subsidy had specific characteristics," implies that transit subsidies are subject to decreasing returns. We estimate that at least a quarter of commuters are unlikely to change their commutes from active or auto modes to transit, regardless of the price of transit.

Finding 9, "Many new subsidy accepters were transit learners who used transit less intensively and somewhat less cost-effectively than existing transit users," lends support to providing subsidies as a way of expanding transit mode-share through behaviour change, with the caution that it will take time for the full consequences and results to manifest. Hence it is important that employers and unions work with the transit authority (TransLink) to provide information about the transit system and how to get the most benefit from public transit when they offer transit subsidies.

Finding 10, “Lower parking prices were associated with more auto commuting,” implies that where applicable, hotel employers and unions consider reducing any employer-paid parking subsidies and promote more efficient use of such space through, for example, education and incentives for carpooling.

Finding 11, “Those who used transit or accepted the subsidy were more likely to report improvements in quality of life, including in their physical health, level of stress and commute predictability, in contrast with overall reports of small declines in quality of life,” has important implications for advocacy around transportation and health, broadly conceived.

Finding 12, “TransLink’s Compass for Organizations program was easy to implement for employers, which supported their participation in the program,” implies that TransLink could use this study to educate employers, unions and workers about the benefits of the program, and provide resources to support its expansion.

Appendix A: Literature review

While multiple studies have looked at the effects of transit subsidies on commuting, it is relatively rare to find attention, much less focus, given to how occupational, demographic and other factors affect commuting behaviour in relation to a transit subsidy. As noted by Zhou, Wang and Schweitzer, "Employer-based studies of commuting are rare because there are few publicly available data sources on employees by employer."[106] Where commuters are differentiated by occupation or employer in transportation studies, that data is likely to be proprietary.[107]

Our study is unusual in that it not only deals with workers in a specific sector and set of occupations who received transit subsidies, but also delves into how commuting patterns and responses to that subsidy differed among subgroups and demographic groups of this study population.

Further, in examining the commuting choices and patterns of hospitality workers, we have varied from the assumed "office worker" norm of the downtown workforce and instead turned our attention to the needs of workers who work around the clock.[108] While some downtown hotel workers do have regular nine-to-five work schedules, our study population also includes many workers whose jobs include irregular, after-hours and weekend shifts. This means our study population has a broader range of commute conditions, as well as more commuting challenges than workers with typical office schedules.

The literature we review here deals with a broad range of what are often referred to as "transit benefits" or "commuter benefits," all of which are tools that fall within the broader category of travel demand management. In addition to subsidies, the programs considered here include those where workers or others received a free transit pass, a tax credit or no discount at all, but instead paid for and received their transit pass through their employer. A shortcoming of some of the literature we reviewed is a lack of specificity about the amount of subsidy provided. Also, some of literature takes the form of overviews or analyses of secondary data, and the conclusions drawn from these studies about the efficacy of transit subsidies in achieving commute-mode shifts are therefore based on multiple types and levels of transit benefits. Finally, some of the literature on transit benefits is from the 1980s and 1990s, and therefore is set within a very different cultural and technological context than today.

Overall, however, our review of this literature has allowed us to conclude that employer-paid transit subsidies can and do influence employees to switch from auto-only commuting to modes that include public transit, though the degree to which this result can be expected

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[106] Jiangping Zhou, Yin Wang, and Lisa Schweitzer, "Jobs/Housing Balance and Employer-Based Travel Demand Management Program Returns to Scale: Evidence from Los Angeles," *Transport Policy* 20 (March 2012): 23, https://doi.org/10.1016/j.tranpol.2011.11.003.

[107] Zhou, Wang, and Schweitzer, "Jobs/Housing Balance," 23.

[108] We are aware of the discounted bus pass program run by the Charlotte Area Hotel Association, but that program has not been the subject of academic study that we know of. See Flora Holmes, "Profiles of Employer-Sponsored Transportation Programs," March 13, 2016, 8, https://slidex.tips/download/profiles-of-employer-sponsored-transportation-programs.

to take place greatly depends on a variety of factors, including social and cultural factors, the amount and type of the subsidy, the state of the local public transit infrastructure, parking and the baseline level of transit commuting. These conclusions are consistent with the findings of our own study.

Canada's public transit tax credit

We will deal first with one of the more recent studies, which was the only Canadian study we could find on the effects of a transit benefit for employees. This was a non-refundable federal tax credit that was available to public transit users who paid income tax from 2006 to 2017.

In 2006, the Canadian federal government implemented a tax credit program whereby eligible public transit users could be reimbursed for 15% of their eligible transit costs. Eligible costs included monthly and annual transit passes, as well as passes for shorter durations, under specified conditions.[109]

Rivers and Plumptre examined the mode-shift impacts of the public transit tax credit. Using data from the 2006 Census and the 2011 National Household Survey, they found that the credit had increased public transit use by between 0.33% and 0.89% over that five-year period (representing approximately 55,000 to 154,000 additional transit commuters) and that 3% to 9% of those who applied for the tax credit were new transit riders.[110] They also found that this effect was higher in Montreal and Toronto than in Vancouver, Victoria, Edmonton and Calgary, and suggested that this could be due to the higher population and larger public transit investments in those cities.[111] The Toronto Transit Commission disagreed with Rivers and Plumptre on this point, suggesting instead that the reason for the program's outsized effect in Toronto was that the Toronto Transit Commission had the most expensive monthly pass in North America.[112] In other words, the tax credit as designed would provide more benefits to Toronto commuters than to commuters in other cities.

In an analysis of the tax credit published in 2015 that used ridership and passholder data from the transit agencies of Montreal, Ottawa, Toronto, Winnipeg, Edmonton and Vancouver, Chandler determined that there is "no economic justification for [the federal] tax credit."[113] Although Chandler could not conclusively state that the tax credit did not lead to an increase in ridership, he said the "only noticeable impact [of the federal tax credit was] to induce commuters to buy monthly passes instead of tickets."[114] Although Chandler's TransLink data was limited to ridership statistics, he concluded that the tax

[109] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 653.
[110] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 661.
[111] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 660.
[112] Toronto Transit Commission, "Chief Executive Officer's Report—April 2017 Update" (Toronto, Ontario: Toronto Transit Commission, April 2017), 54, https://www.ttc.ca/About_the_TTC/Commission_reports_and_information/Commission_meetings/2017/April_20/Reports/1_Chief%20Executive%20Officer%27s%20Report%20-%20April%202017%20Update.pdf.
[113] Vincent Chandler, "The Effectiveness and Distributional Effects of the Tax Credit for Public Transit," *Canadian Public Policy* 40, no. 3 (2014): 267, https://doi.org/10.3138/cpp.2013-073.
[114] Chandler, "Tax Credit for Public Transit," 267.

credit had "no impact" in Vancouver.[115] Chandler's analysis accounted for student passes and fare increases, as well as short-term events, such as variations in the cost of fuel, transit strikes and the Olympics.

Rivers and Plumptre also tried to determine how much carbon dioxide equivalent was saved annually by people moving from automobiles to public transit in response to the tax credit. To do so, they assumed that every new transit trip created through the tax credit program would have otherwise been made by private auto, although they acknowledged that this assumption was likely to somewhat overamplify the policy's positive environmental impacts.[116] With this in mind, the authors estimated that the program may have saved 0.0112 to 0.1665 metric tons of carbon dioxide equivalent annually depending on different estimates of the number of tax credit beneficiaries and on whether the new transit riders were accommodated on existing transit routes or whether the program led to increases in transit services.[117] Based on this low figure, Rivers and Plumptre concluded that "as a strategy for reducing car traffic, changing public behaviour to promote increased mode share for public transit, and reducing emissions of greenhouse gases" the tax credit program "is expensive and considerably less cost-effective than potential alternatives."[118] The authors also describe the program as having failed to alter the travel modes of commuters.

The Canadian government seems to have agreed, citing the program's failure to encourage more transit use as the grounds for eliminating it in 2017.[119] The Toronto Transit Commission, on the other hand, did consider the program to be effective: it attributed an increase of 900,000 Metropass sales to the program.[120] However, the commission seems to have arrived at this figure simply by subtracting the number of Metropass sales in 2006 from those made in 2017, noting that 900,000 is attributable to the program because "there were no significant enhancements to the TTC's Metropass programs during this time period that could help to explain this sales growth."[121] The commission did not seem to consider demographic or population changes that could explain the sales growth.

In terms of the program's equity impacts, when the Canadian government analyzed the program it found that in 2008, people earning less than $37,886 made up almost 58% of the program's beneficiaries.[122] However, according to Rivers and Plumptre, the program was used more by middle- and high-income earners. They suggested that high-income people may have had more access to tax-planning services that allowed them to take advantage of the tax credit program.[123]

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[115] Chandler, "Tax Credit for Public Transit," 264.
[116] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 660–661.
[117] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 661.
[118] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 661.
[119] Andrea Janus, "End of Public Transit Tax Credit to Cost TTC $5M, Report Says," CBC, April 14, 2017, https://www.cbc.ca/news/canada/toronto/public-transit-tax-credit-elimination-cost-1.4071264.
[120] Toronto Transit Commission, "Chief Executive Officer's Report," 53.
[121] Toronto Transit Commission, "Chief Executive Officer's Report," 53.
[122] Department of Finance Canada, "Archived—Tax Expenditures and Evaluations 2011," 2011, https://www.canada.ca/content/dam/fin/migration/taxexp-depfisc/2011/taxexp11-eng.pdf.
[123] Rivers and Plumptre, "Effectiveness of Public Transit Tax Credits," 659.

Employer-paid transit subsidy programs

Several studies have examined employer-based transit subsidy programs, as well as broader "transit benefit" and "commuter benefit" programs, and their effects on commute mode choices.

Gould and Zhou's 2008 study is particularly relevant in that it is one of the few we found that specified the employer and because the authors included data about gender, as well as other demographic characteristics, in their analysis of how employees responded to a transit benefit.[124] Their study recruited employees of the University of California, Los Angeles, who commuted by single-occupancy vehicle and offered them a free transit pass for three months (between June and September) in return for which they were required to give up their parking permit (which cost about US$70 per month).[125] Approximately 14% of the university's employees commuted by transit at the outset of the study.[126] At the end of the experiment, participants were free to take back their parking permit, but those who chose to continue regularly commuting by transit could receive a 50% subsidy on their transit passes.[127] The total number of participants was 381, with the gender split (237 women and 144 men) closely reflecting that of the university's workforce.[128] However, the participants, all of whom self-selected into the trial, "had smaller households, less need for a car during the day, and few or no children under age 16."[129]

The authors considered the outcome of the trial to be an "unusually successful demonstration of transportation demand management" in that only 30% of the participants decided to return to solo driving when the three months was up.[130] Based on participants' survey responses, the authors attribute the success in part to the high cost of gas at the time (US$4.60 per gallon) as well as the high cost of parking, though they note that participants also appreciated being able to try out a different way of getting to work without giving up their access to parking.[131] It is also notable that those who volunteered to participate in the trial were asked about their level of transit experience when they registered so that information could be customized for them. Each participant was matched to the transit provider that best suited their home address.[132]

Gould and Zhou found that overall, women returned to driving alone at a slightly higher rate than men (31% versus 29%) but that in the age groups 26–35 and 55+, more women than men chose to change modes.[133] Overall, however, the authors argue that "this study shows that similar travel choices are made by male and female commuters who are fairly

[124] Jane Gould and Jiangping Zhou, "A Commitment to Continue? Comparing Women and Men Commuters Who Choose Transit over Driving Alone," *Women's Issues in Transportation: Summary of the 4th International Conference, Volume 2: Technical Papers* 46 (2011): 154–62, https://doi.org/10.17226/22887.
[125] Gould and Zhou, "Commitment to Continue," 154–155.
[126] Gould and Zhou, "Commitment to Continue," 154.
[127] While not specifically mentioned, it appears that the 50% transit subsidy was generally available to employees at the time and not an additional benefit for trial participants. Gould and Zhou, "Commitment to Continue," 154.
[128] Gould and Zhou, "Commitment to Continue," 156.
[129] Gould and Zhou, "Commitment to Continue," 161.
[130] Gould and Zhou, "Commitment to Continue," 154.
[131] Gould and Zhou, "Commitment to Continue," 155.
[132] Gould and Zhou, "Commitment to Continue," 157.
[133] Gould and Zhou, "Commitment to Continue," 157.

matched on salary, household size, geographic location, travel distance to work, and other characteristics."[134] After analyzing many demographic and geographic variables, the authors found that, for both men and women, the one that was most predictive of whether participants returned to solo driving was whether they had continued to drive to work at least twice a week during the trial period.[135]

As is the case with University of California, Los Angeles, many North American universities have implemented multi-faceted travel demand management policies that may include subsidies for transit, as well as other tools and services such as shuttles, carpooling, parking management and bike-sharing.[136] However, employees are not always eligible for these subsidized transit passes (often called universal passes or U-Passes), and the programs may be funded through a student levy, rather than (only) the university as an employer.[137] In any case, while there are some university students among our study population, we consider university students and the hotel workers that participated in this study to be quite different, and so will not deal with studies of student pass programs or other university programs here. Even when considered strictly as employers, universities may be a special case, both in their willingness to embrace sustainable transportation goals and in that some of their employees (i.e., faculty) have more control over their work schedules and ability to work from home—certainly more so than hotel housekeepers, front desk clerks and bartenders.[138]

Turning to studies that examine the effects of transit benefit programs at a population level, we have Bueno et al., who, using 2010 to 2011 data from the Regional Household Survey, examined commuter behaviour in the New York-New Jersey region.[139] This survey was representative of the region and included almost 22,000 commuters, all of whom completed diaries of their travel over a 24-hour period.[140] Those surveyed were 51% men and 49% women, and 76% white. Full-time employees made up 73% of those surveyed. Sixty-one percent drove to work, 92% had licences to drive and 88% reported having an auto in their household. Twenty-four percent reported receiving some type of commuter benefit, but only 6% reported an employer-paid public transport benefit.[141] The study did not differentiate effects by the type of public transport benefit, such as universal passes, vouchers and reimbursement.

Using a multinomial logit model, Bueno et al. determined that "commuters provided with [employer-paid] public transportation benefits are about nine times more likely to ride public transport than to drive alone and three times more likely to change their travel

[134] Gould and Zhou, "Commitment to Continue," 161.
[135] Gould and Zhou, "Commitment to Continue," 160.
[136] Victoria Transport Policy Institute, "Campus Transport Management: Trip Reduction Programs on College, University and Research Campuses," updated September 29, 2015, see Table 1, https://www.vtpi.org/tdm/tdm5.htm.
[137] Victoria Transport Policy Institute, "Campus Transport Management," Table 1.
[138] Zhou, Wang, and Schweitzer, "Jobs/Housing Balance," 23.
[139] Paola Carolina Bueno, Juan Gomez, Jonathan R. Peters, and Jose Manuel Vassallo, "Understanding the Effects of Transit Benefits on Employees' Travel Behavior: Evidence from the New York-New Jersey Region," *Transportation Research Part A: Policy and Practice* 99 (May 1, 2017): 1–13, https://doi.org/10.1016/j.tra.2017.02.009.
[140] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 5.
[141] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 5–6.

behaviour toward walking or cycling."[142] Strong negative effects were also found for receiving auto-related benefits: "benefits such as toll payments, mileage reimbursements or free parking decreased the likelihood to commute by public transport over private car by 82%."[143] The authors excluded gender, residence type, household structure, age and other variables from their final model on the basis that they were not statistically significant, stating that "at least for commute mode choice, the conditioning influence of receiving subsidies prevails over other individual variables.[144] Income was not found to be an explanatory variable, but ethnicity was, with "white (Anglo) people significantly more likely to commute by using private transport as compared to other races and ethnicities."[145] Part-time workers and those with varying work locations had a lower chance of commuting by public transport, as did those who had one or more autos, in the latter case by −96% compared to choosing private transport.[146] The authors also determined that accessibility to public transport, along with the previously mentioned auto ownership and receipt of commuter benefits, had a greater impact on mode decisions compared to all the other characteristics analyzed.[147]

Given the demographic, occupational and earnings profile of workers in our study, Lachapelle's study of Atlanta commuters is particularly interesting. Published in 2018 but based on older survey data, Lachapelle's study investigated the questions, "What are the factors associated with being offered an employer subsidized transit pass, using it when it is available, and wanting to use one when it is not offered by employers?"[148] He grouped these factors into four categories: socio-demographics, home and workplace built environment and transit access, commute characteristics and availability of other travel demand management programs. Lachapelle hypothesized that lower-income employees had less access to transit incentives through their employers, and that workplace location characteristics would affect both the provision of transit incentives and employees' acceptance and use of them.[149] A third hypothesis was that there was a large pool of workers without subsidized passes, particularly among those earning low incomes, who would like to have one.[150] The author also expected that the presence and quality of transit routes between home and work and that "the necessity of picking up or dropping off children would limit workers' ability to take advantage of subsidized passes."[151] To address these hypotheses, Lachapelle carried out a multivariate analysis of a random subsample of 3,430 employed people who responded to the SMARTRAQ travel survey conducted in the Atlanta region in 2001 and 2002. He found that people who earned less than $30,000 or who worked in sales or service occupations were less likely to be offered a transit pass.[152]

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[142] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 5–6.
[143] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 8.
[144] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 8.
[145] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 8.
[146] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 8.
[147] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," page 7, definition of accessibility to public transport.
[148] Ugo Lachapelle, "Employer Subsidized Public Transit Pass: Assessing Disparities in Access, Use, and Latent Demand," *Case Studies on Transport Policy* 6, no. 3 (2018): 354, http://dx.doi.org/10.1016/j.cstp.2017.08.006.
[149] Lachapelle, "Employer Subsidized Public Transit Pass," 356.
[150] Lachapelle, "Employer Subsidized Public Transit Pass," 356.
[151] Lachapelle, "Employer Subsidized Public Transit Pass," 356.
[152] Lachapelle, "Employer Subsidized Public Transit Pass," 356, 358, and 361.

The presence of residential density near the workplace, transit accessibility, travel demand management measures and living in two of the central Atlanta counties (Fulton and DeKalb) were positively associated with being offered a transit pass.[153] Among workers who did work for employers who offered subsidized transit passes, those earning less than $30,000 were less likely to actually use the pass. The presence of "additional services" and higher residential density near workplaces made it more likely that workers would report using a subsidized pass.[154]

When it comes to expressing interest in having and using a subsidized transit pass, women who were "non-white" were less likely to want one, and white men were more likely to.[155] The finding that lower-income workers who did receive subsidized passes were less likely to report using their pass than those with higher incomes was surprising. Lachapelle suggests that this mismatch between those who most need a subsidy and those most likely to use it could be caused by

> the impedance created by the low quality of transit service between home and work [which] surpasses the benefits provided by [the] employer subsidized transit pass. Equally, a higher proportion of low-income individuals may have work schedules that result in off-peak traveling, when transit service is often of lower quality. Such commute characteristics could potentially conspire to reduce the propensity of lower income individuals to use subsidized transit passes even when being offered.[156]

In another recent study of Atlanta using a different and more recent data source (the 2011 Atlanta Regional Household Travel Survey), Ghimire and Lancelin analyzed a variety of sociodemographic and other factors to determine which were positively or negatively associated with transit use. They found that "employees who had received free or subsidized transit pass had 156% higher odds of commuting on transit, all else equal, compared to those who had not received free or subsidized transit [passes]."[157] Conversely, employees who had access to free or subsidized workplace parking, had 71% lower odds of commuting on transit than those who did not.[158] For demographic factors, they determined that those with the characteristic of "female" were 20% less likely to commute on transit compared to those without that characteristic. Similarly, those who were white had 55% lower odds of doing so than those who were not, but white people who received a free or subsidized transit pass had better odds. People who had at least a college degree had 44% lower odds of commuting by transit, but again, those among this group who received free or subsidized transit passes had higher odds. Those with children in the house were 44% less likely to commute by transit.[159]

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[153] Lachapelle, "Employer Subsidized Public Transit Pass," 358.
[154] Lachapelle, "Employer Subsidized Public Transit Pass," 358–359.
[155] Lachapelle, "Employer Subsidized Public Transit Pass," 359.
[156] Lachapelle, "Employer Subsidized Public Transit Pass," 360–361.
[157] Ramesh Ghimire and Colby Lancelin, "The Relationship between Financial Incentives Provided by Employers and Commuters' Decision to Use Transit: Results from the Atlanta Regional Household Travel Survey," *Transport Policy* 74, no. November 2018 (2019): 107, https://doi.org/10.1016/j.tranpol.2018.11.005.
[158] Ghimire and Lancelin, "Relationship between Financial Incentives and Commuters' Decision to Use Transit," 107.
[159] Ghimire and Lancelin, "Relationship between Financial Incentives and Commuters' Decision to Use Transit," 107–108.

Ghimire and Lancelin conclude by recommending that "As far as possible, local employers should be encouraged to offer free or subsidized transit passes instead of free or subsidized parking at the workplace."[160] Further, they recommend that "since commuters' mode choice is significantly associated with transportation-related financial incentives provided by their employers, future analysis of travel mode choice should account for these financial incentives along with land use or built environment and transit measures at origin, and/or destination and sociodemographic characteristics of the commuters."[161]

We turn now from Atlanta to Denver, Colorado, where in 1991, the Regional Transportation District introduced a universal pass program called the Eco Pass for employers throughout its region. The cost for employers per employee ranged from US$31 to US$279 depending on the worksite location and the number of workers. This was a substantial drop from the regular fare, which ranged from US$420 to US$1,260. There was a minimum charge for employers (US$540 to US$4,860) that was based on the worksite location and number of workers.[162]

According to a 2005 report by the Transportation Cooperative Research Board (TCRP), approximately 52,000 employees participated in Denver's Eco Pass program, with an estimated 12% to 21% of riders using it. More than 1,000 employers participated in the universal pass program with approximately 50 employees per employer.[163] The survey that the Denver Regional Transportation District conducted about the program found that worksites in the central business district that implemented the pass "saw an average of approximately 16 new transit riders per 100 employees, for a 22-percent increase in transit use."[164] The rate at which new riders joined the system was considerably lower for suburban worksites, however. They had an average of "approximately 9 new transit riders per 100 employees, representing more than a 50-percent increase in transit use."[165]

Denver's transit authority described the success of the Eco Pass program as "mixed," but that was because the authority was concerned that the program was not correctly priced, meaning that "employers [were] being undercharged for the services their employees consume."[166]

In their separate study of the Denver Eco Pass program, Ecola and Grant found that it "may have accounted for about 6,000 new riders per day, or assuming two transit trips per day, up to nearly 42 percent of the overall growth."[167]

In addition to its discussion of the Denver Eco Pass, the TCRP's 2005 report analyzed 21 surveys conducted on the recipients of various types of transit benefits in 12 metropolitan

[160] Ghimire and Lancelin, "Relationship between Financial Incentives and Commuters' Decision to Use Transit," 111.
[161] Ghimire and Lancelin, "Relationship between Financial Incentives and Commuters' Decision to Use Transit," 112.
[162] Transportation Research Board and National Academies of Sciences, Engineering, and Medicine, *Transit Cooperative Research Program Report 107: Analyzing the Effectiveness of Commuter Benefits Programs* (Washington, DC: National Academies of Science, 2005), 15, https://doi.org/10.17226/21979.
[163] Transportation Research Board, *TCRP Report*, 63–65.
[164] Transportation Research Board, *TCRP Report*, 52.
[165] Transportation Research Board, *TCRP Report*, 52.
[166] Transportation Research Board, *TCRP Report*, 72.
[167] Liisa Ecola and Michael Grant. "Impacts of Transit Benefits Programs on Transit Agency Ridership, Revenues, and Costs." *Journal of Public Transportation* 11, no. 2 (2008): 9.

regions. The TCRP's other data sources included worksite trip reduction records and seven interviews of transit agency officials conducted by other researchers.[168] The 21 surveys were administered by transit authorities and other organizations between 1989 and 2004. There were three sets of worksite trip reduction records, for worksites in Southern California (1988 to 1996); Tucson, Arizona (1996 to 2001); and Washington State (1995, 1997, 1999 and 2001). The datasets ranged from under 1,500 to over 33,000 records, and they focused not on transit ridership, but on reducing the number of automobile trips. The transit subsidy programs covered by the 21 surveys included those that provided or subsidized universal passes, monthly passes, stored value cards or vouchers, as summarized in Table 39.

Table 39: Summary of pass types covered by surveys of the Transit Cooperative Research Program.

Pass type	Pass description	# of surveys
Universal pass	Pass allowed unlimited use of the transit system. It was bought by the employer for every employee, it was generally deeply discounted, and it was an annual pass. Could be modified so that employees contributed to the cost.	6
Monthly pass	Pass allowed unlimited use of the transit system for a fixed period of time.	1
Stored-value card	A card that be could used multiple times for multiple trips, of which an employer purchased a fixed amount. Trips were deducted from the fixed amount.	1
Voucher	Paper fares (like cheques) distributed by the transit agencies, regional organizations or third-party providers.	10
Multiple types	Some programs may have had a tiered system or provided multiple options for employees.	3
Total		**21**

The TCRP report also divided commuter benefits into two types: employer-paid and employee-paid. Employer-paid benefits involved the employer directly paying for the cost of the transit pass, while employee-paid benefits involved employees paying "for transit or vanpool expenses themselves using pre-tax income via payroll deduction."[169] While employee-paid programs can save employees money on taxes and offer the convenience of receiving a transit pass from one's employer, the report found that "employer-paid programs are more effective in encouraging increased transit use."[170]

Based on the 21 surveys they reviewed, the TCRP found that overall, the transit benefit programs they studied, which included both employer-paid and employee-paid programs, increased transit mode shares by an average of nearly 2 to 17 percentage points and that "typically 10 to 40 percent of transit benefits recipients were new to transit."[171] The TCRP

[168] The 12 metropolitan regions were Philadelphia, Harrisburg, Pittsburgh, Washington DC/Montgomery County, San Francisco, San Jose, Los Angeles, Portland (Oregon), Minneapolis/St. Paul, Denver, Atlanta and New York. The seven agencies are WMATA, MARTA, King Country Metro, RTD, Metro Transit, VTA and Valley Metro.
[169] Transportation Research Board, *TCRP Report*, 72.
[170] Transportation Research Board, *TCRP Report*, 54.
[171] Transportation Research Board, *TCRP Report*, 48–49.

also found that "between 90 and 100 percent of new transit riders were previously [single-occupancy vehicle] commuters."[172]

Moreover, the TCRP report suggests that "in areas with high transit ridership, transit benefits programs can be effective in encouraging increased transit use, and some of the increased use could be for non-commute trips."[173] For example, based on the TCRP's analysis of the seven transit agency interviews, "Several agencies added stops or made minor modifications to routes to better serve the employees at newly participating employers. In one case, ridership demand grew so much that more vehicles had to be added to routes."[174]

Table 40 summarizes the details of the employer-paid transit benefits based on survey responses from benefit recipients in Portland, Oregon; San Francisco; Washington, DC, and elsewhere in the US, drawn from the TCRP report.

[172] Transportation Research Board, *TCRP Report*, 49.
[173] Transportation Research Board, *TCRP Report*, 49.
[174] Transportation Research Board, *TCRP Report*, 72.

Table 40: Benefit amounts and results for employer-paid transit benefit programs in Portland, Oregon; San Francisco; and Washington, DC.[175]

Region	Year of survey	Employees surveyed	Benefit	Value of benefit	Results: increase in transit ridership (%)
Portland, Oregon	1999	7,333 employees participating in the TriMet monthly passes and PASSport program from 321 employers	Monthly and universal passes	No benefit	24
				40%–60% paid	31
				90%–100% paid	46
				PASSport (universal pass usually 100% employer-paid)	57
San Francisco	1994	3,600 to 4,500 employees receiving commuter check vouchers from 239 employers	Voucher		**employees reporting increase in number of transit work trips**
				$20/month	35
				$30/month	30
				$30+/month	38
Washington, DC, and elsewhere in US	1993	59,000 federal employees throughout the US at 150 agencies (75% of employees in DC region)	Multiple types of passes available, all employer-paid		**employees using transit or saying likely to ride transit**
				Existing $21 per month	31
				Proposed $60 per month	49

Income-based transit subsidy programs

We have so far dealt only with employer-based transit subsidies for workers, but another type of transit subsidy that's relevant to our study is income based, especially given that some members of our study population were earning minimum wage when we surveyed them.

Rodríguez et al. examined the effects of an income-based transit subsidy in Bogotá, Colombia, using three datasets collected in 2015, a year after the implementation of the subsidy. They found that there was a significant gap between the number of people who were eligible for the transit subsidy program (800,000) versus the number who self-selected and signed up for the program (260,000), and then again versus the number who actually used the program (150,000).[176] The authors found that "word of mouth appears to be a strong determinant of obtaining the subsidy; an increase of 10% in the proportion of [transit subsidy] cards in a neighbourhood generates an increase in the probability of obtaining the card by 11.5%."[177] In all, the authors found that the most important

[175] This table is adapted from similar tables in the TCRP's report. See tables 2 and 13 on pages 7 and 27.
[176] Camila Rodríguez et al., "Examining Implementation and Labor Market Outcomes of Targeted Transit Subsidies: Subsidy by Sistema Nacional de Selección de Beneficiarios for Urban Poor in Bogotá, Colombia," *Transportation Research Record: Journal of the Transportation Research Board, 2581*, no. 1 (2016): 12, https://doi.org/10.3141/2581-02.
[177] Rodríguez et al., "Examining Implementation and Labor Market Outcomes of Targeted Transit Subsidies," 13.

determinants of subsidy acceptance were, word of mouth, gender and employment status. "Across the board, women are more likely to use the subsidy than men are. Those who are working are more likely to apply for the subsidy than those who are not seeking employment."[178]

Rodríguez et al. were primarily focused on employment status and income; however, the authors suggested that since women were 10% more likely to opt in to the income-based Bogotá subsidy, it "might corroborate the argument that women have different travel patterns and generally travel more because of other household and nonemployment duties and thus would benefit more from subsidized travel."[179] Since the authors only looked at subsidy acceptance, they could not draw conclusions regarding how mode shift or pass use may have differed between men and women.

Another study on an income-based transit subsidy is by Rosenblum et al. While results are still preliminary, this 2019 Boston-based study involved the introduction of a subsidized monthly transit pass for people with low incomes. The discounted pass cost $29, compared to the standard monthly pass of $84.50.[180] To qualify for the subsidized pass, participants needed to have been recipients of the Supplemental Nutrition Assistance Program and must have been ineligible for an existing subsidy (senior, students or disabilities, for example).

Rosenblum et al. found that low-income subsidy accepters "took about 30% more trips" than low-income people who did not accept the subsidy, and that the accepters also "took more trips to health care and social services."[181] As well, the low-income subsidy accepters differed from the average transit user in the following ways:

- They took more of their trips during off-peak times.
- They relied more heavily on buses.
- They transferred more among modes and routes.
- They paid with stored value on a card more often (as opposed to using day, weekly or monthly passes).[182]

Finally, through a survey conducted for their study, the authors found that the top transit concerns of low-income people were reliability, affordability, frequency and crowding, and this was equally true for subsidy accepters and non-accepters.[183]

Parking subsidies versus transit subsidies

Based on our review of the recent literature, the effect of a transit subsidy may depend on the existence and levels of subsidies for parking. A study by Hamre, using the 2007–2008 Washington, DC, Household Travel Survey, found that "no benefit combination that

[178] Rodríguez et al., "Examining Implementation and Labor Market Outcomes of Targeted Transit Subsidies," 13–14.
[179] Rodríguez et al., "Examining Implementation and Labor Market Outcomes of Targeted Transit Subsidies."
[180] Jeffrey Rosenblum et al., "How Low-Income Transit Riders in Boston Respond to Discounted Fares: A Randomized Controlled Evaluation—Preliminary Results" (Cambridge, Massachusetts, 2019), 4.
[181] Rosenblum et al., "How Low-Income Transit Riders in Boston Respond to Discounted Fares," 2.
[182] Rosenblum et al., "How Low-Income Transit Riders in Boston Respond to Discounted Fares," 2.
[183] Rosenblum et al., "How Low-Income Transit Riders in Boston Respond to Discounted Fares," 9.

included free car parking was associated with increased odds for riding public transportation, walking, or cycling to work."[184] This is despite the fact that "commuters with employers who only offer public transportation benefits are about 11 times more likely to take public transportation than to drive," which leads to the conclusion that parking subsidies negate the effect of transit subsidies.[185]

Bueno et al. also determined "that the provision of private transport-related benefits, such as free car parking . . . is strongly associated with a low likelihood to choose public transportation."[186] The authors also argue that achieving a larger mode shift to transit requires both removing incentives for driving and increasing the benefits of alternative commute modes.[187]

Badoe, using the Transportation Tomorrow Survey of the Greater Toronto Area (1996), determined that free parking at work "is negatively associated with the daily number of trips an individual makes by public transit," as well as being negatively associated with the decision to buy a monthly transit pass.[188]

Wilson and Shoup, using different case studies with a variety of sources, looked at office workers in the Los Angeles central business district, as well as case studies across the United States and Canada, and found that "all the cases show that ending employer-paid parking reduces, and in some cases greatly reduces, both solo driving and automobile trips."[189] The authors noted that when free parking is eliminated, people begin carpooling to work and that "employers who provide rideshare incentives while continuing to subsidize solo drivers rarely achieve significant increases in ridesharing."[190] Furthermore, mode changes after the price of parking increased occurred among all income categories, and did not lead to separate modes of transportations stratified by income.

Only one study we reviewed differed from the consensus on the effects of parking subsidies. Lachapelle concluded that "receiving free or subsidized parking was positively associated with [transit] use, suggesting that the presence of free parking does not hinder the use of employer passes."[191] All of the other studies we reviewed found that low parking prices are associated with more auto commuting.

Conclusion

Commute choices affect and are affected by a multitude of factors that extend beyond the scope of this literature review. There are many more studies that address the social

[184] Andrea Hamre and Ralph Buehler, "Commuter Mode Choice and Free Car Parking, Public Transportation Benefits, Showers/Lockers, and Bike Parking at Work: Evidence from the Washington, DC Region," *Journal of Public Transportation* 17, no. 2 (2014): 83.
[185] Hamre and Buehler, "Commuter Mode Choice," 80.
[186] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 12.
[187] Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior," 12.
[188] D. A. Badoe and M. K. Yendeti, "Impact of Transit-Pass Ownership on Daily Number of Trips Made by Urban Public Transit," *Journal of Urban Planning and Development* 133, no. 4 (2007): 247.
[189] Richard W. Willson and Donald C. Shoup, "Parking Subsidies and Travel Choices: Assessing the Evidence," *Transportation* 17, no. 2 (1990): 145.
[190] Willson and Shoup, "Parking Subsidies and Travel Choices," 147.
[191] Lachapelle, "Employer Subsidized Public Transit Pass," 353–63.

distribution of commute modes and other travel behaviours. Gender, income, ethnicity and immigration status are all important factors to consider, but relatively few studies attempt to understand or describe the relationship between these factors and transit subsidies.[192]

It is clear that our research can make a contribution to this vast body of literature. Not only does our research confirm findings regarding subsidy uptake, but we are able to contribute a level of occupational and demographic specificity that is rarely available. For example, many studies focus on broad geographic areas rather than on sectors or industries, and thus, by looking at different occupation groups within the hospitality industry, we can describe how work schedules and years of employment may affect subsidy uptake and mode shift. Even just the fact that our study asked open-ended questions means that we can discuss reasons for subsidy uptake rather than just uptake levels.

[192] For discussions of gender, see Robin Law, "Beyond 'Women and Transport': Towards New Geographies of Gender and Daily Mobility," *Progress in Human Geography* 23, no. 4 (1999): 567–88; Paul Ong and Evelyn Blumenberg, "Job Access, Commute and Travel Burden among Welfare Recipients," *Urban Studies* 35, no. 1 (1998): 77–93; Ghimire and Lancelin, "The Relationship between Financial Incentives and Commuters' Decision to Use Transit"; Sandra Rosenbloom and Elizabeth Burns, "Why Working Women Drive Alone: Implications for Travel Reduction Programs," *Transportation Research Record* 1459 (1994): 39–45, https://escholarship.org/uc/item/4x17v3f1; David P. McElroy, "Integrating Transit Pass Ownership into Mode Choice Modelling" (University of Toronto, 2009); Md. Moniruzzaman and Steven Farber, "What Drives Sustainable Student Travel? Mode Choice Determinants in the Greater Toronto Area," *International Journal of Sustainable Transportation* 12, no. 5 (2018): 367–79, https://doi.org/10.1080/15568318.2017.1377326. For discussions of income, see Hamre and Buehler, "Commuter Mode Choice"; Bueno et al., "Effects of Transit Benefits on Employees' Travel Behavior"; Lachapelle, "Employer Subsidized Public Transit Pass"; Rodríguez et al., "Examining Implementation and Labor Market Outcomes of Targeted Transit Subsidies"; John Pucher, "Equity in Transit Finance: Distribution of Transit Subsidy Benefits and Costs among Income Classes," *Journal of the American Planning Association* 47, no. 4 (1981): 387–407, https://doi.org/10.1080/01944368108976521; Oded Cats, Yusak O. Susilo, and Triin Reimal, "The Prospects of Fare-Free Public Transport: Evidence from Tallinn," *Transportation* 44 (2017): 1083–1104, https://doi.org/10.1007/s11116-016-9695-5. For discussions of ethnicity, see Ong and Blumenberg, "Job Access, Commute and Travel Burden among Welfare Recipients"; Brian D. Taylor, Douglas Miller, Hiroyuki Iseki, and Camille Fink, "Nature and/or Nurture? Analyzing the Determinants of Transit Ridership across US Urbanized Areas," *Transportation Research Part A: Policy and Practice* 43, no. 1 (2009): 60–77, https://doi.org/10.1016/j.tra.2008.06.007; Brian D. Taylor and Eric A. Morris, "Public Transportation Objectives and Rider Demographics: Are Transit's Priorities Poor Public Policy?," *Transportation* 42 (2015): 347–67, https://doi.org/10.1007/s11116-014-9547-0. For discussions of immigration, see Daniel G. Chatman and Nicholas J. Klein, "Why Do Immigrants Drive Less? Confirmations, Complications, and New Hypotheses from a Qualitative Study in New Jersey, USA," *Transport Policy* 30 (2013): 336–44, https://doi.org/10.1016/j.tranpol.2013.10.002; Taylor et al., "Nature and/or Nurture?"

Appendix B: Hypotheses

This section of our report lists our hypotheses, their outcomes and where discussion of these can be found in this report.

Table 41: Hypotheses on transit engagement*

Concept	Independent variables	Hypothesized relationship** (to overall *direct* engagement with transit-only commuting)	Outcome **	Outcome/ finding discussed
Transit subsidy	Subsidy offered	P	P—strong	Findings 1–4 Appendix F—1a1, 1a2
	Subsidy level	P	P—strong	Findings 1, 5 Appendix F—1a3
	Subsidy change	P	P—strong	Findings 5, 9 Appendix F—1b1, 1b3
Parking	Parking price	P	P—weak	Finding 10
	Parking spaces	N	N—weak	Finding 10
Accessibility	Frequent transit service in FSA of residence	P	P	Appendix F—1a7
	Driving distance	P	P	Appendix F—1a2, 1a3
	Transit time	N	N	Finding 8; Appendix F—1a3, 1a5
	Transit segments	N	N	Finding 8; Appendix F—1a5, 1a7
	Live in downtown Vancouver FSA (V6B, C, E, G or Z)	—	N—strong	Finding 8; Appendix F—1a1, 1a2, 1a3, 1a4, 1a5, 1a8
	Zone 2	P	P—strong	Finding 6 Appendix F—1a1, 1a4, 1a5, 1a7
	Zone 3	N	N—weak	Appendix F—1a2
	Job (at study hotel) is close to transit	P	P—strong	Finding 6; Appendix F—1a1, 1a4, 1a5, 1a7
Work circumstances	Works weekends	P	NR	Finding 3; Appendix F—1a2; Appendix E—Table 67
	Off-peak travel	P	P—weak	Appendix E, Table 71
	Leaves home and returns between 6 a.m. and 9 p.m.	P	P—weak	Appendix F—1a2, 1a8
	Has regular shift start and end time	P	P—weak	Finding 3; Appendix F—1a2
	Has regular shift start and end time, *and* leaves and returns home between 6 a.m. and 9 p.m.	P	NR	
	Other job or jobs	N	N	Appendix F—1a6
	Attends school	N	N	Appendix F—1a4, 1a7

Concept	Independent variables	Hypothesized relationship** (to overall *direct* engagement with transit-only commuting)	Outcome **	Outcome/ finding discussed
	Second job or school is in core or on transit	P	P	Appendix F—1a1, 1a7
	Occupational group: housekeeping/room attendant	P	P—strong	Findings 3, 6 Appendix F—1a5
	Occupational group: guest front-serving	P	P	Finding 3
	Occupational group: back of house serving, operations	P	P	Finding 3
	Occupational group: management and office	P	NR	Finding 3
	Occupational group: food and beverage service	P	NR	Finding 3
Auto availability	Have a valid driver's licence	N	N—strong	Appendix F—1a4, 1a5, 1a7, 1a8
	Access to automobile	N	N—strong	Appendix F—1a1, 1a2, 1a3, 1a4, 1a5, 1a7; Appendix E—Table 75
	No stops on commute to and from work	P	P	Finding 6; Appendix F—1a4, 1a5
Demographics	Years in job	—	P	Appendix F—1a2, 1a3
	New employee	—	P	Finding 3; Appendix E—Table 70
	Female	—	NR	Demographics
	Visible minority	—	P—weak	Finding 6
	Immigrated as a child	—	P	Appendix F—1a4
	Immigrated as an adult	—	P—strong	Findings 3, 6; Appendix F—1a2, 1a3, 1a4, 1a5, 1a7
	Children present in household	N	P	Finding 3; Appendix E—Table 67
	Non-working adult in household	N	NR	Appendix E, Table 73
	Renter	P	P—strong	Demographics; Finding 3; Appendix F—1a6, 1a7, 1b3; Appendix E—Table 69, Table 74)
	Housing stress	P	NR	Demographics
	Earnings	N	NR	Demographics
	Household income	N	NR	Demographics

* Transit engagement refers to transit behaviours that range from having a Compass Card, to including some transit in one's commute, to purchasing a monthly transit pass product, to accepting a transit subsidy and to commuting only by transit.

** P = positive relation; N = negative relation; NR = no relation observed (including cases of insufficient data); strong = highly statistically significant relation and/or triangulated findings; weak = partial or indirect evidence only

Table 42: Hypotheses on quality of life

Quality-of-life outcome	Independent variables	Hypothesized relationship* (to overall *direct* engagement with transit)	Outcome*	Finding discussed
General happiness with life	Subsidy level	P	**P**	Finding 11; Appendix F—2b1
	Transit user (has travelled in past month)	P	**P**	Finding 11; Appendix F—2a1
	Possession of a monthly Compass Card product	P		
	Subsidy acceptance	P	**P**	Finding 11
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**NR**	
Time spent with family/ friends	Subsidy level	P	**P**	Finding 11; Appendix F—2b2
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**N**	Appendix E—Table 76
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**NR**	
Physical health	Subsidy level	P	**NR**	
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**P**	Appendix F—2a3
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**NR**	
Level of stress	Subsidy level	P	**P**	Finding 11
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**P**	Appendix F—2a4,
	Subsidy acceptance	P	**P**	Appendix F—2a4, 2b4
	Commute by transit only	P	**P**	Appendix E—Table 80
	Any commuting by transit	P	**P**	Appendix E—Tables 78, 79, 81
The predictability of your commute from home to work	Subsidy level	P	**P**	Appendix F—2b5
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**P**	Finding 11; Appendix F—2a5
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**P**	Finding 11; Appendix F—2a5

Quality-of-life outcome	Independent variables	Hypothesized relationship* (to overall *direct* engagement with transit)	Outcome*	Finding discussed
The predictability of your commute back home	Subsidy level	P	**P**	Finding 11; Appendix F—2b6
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**P**	Appendix F—2a6
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**P**	Appendix F—2a6
Your shift schedule(s)	Subsidy level	P	**NR**	
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**NR**	
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**NR**	
Your general happiness at work	Subsidy level	P	**NR**	
	Transit user (has travelled in past month)	P	**NR**	
	Possession of a monthly Compass Card product	P	**NR**	
	Subsidy acceptance	P	**NR**	
	Commute by transit only	P	**NR**	
	Any commuting by transit	P	**P**	Appendix E—Table 77

* P = positive relation; N = negative relation; NR = no relation observed (including cases of insufficient data).

Appendix C: Methodology

This appendix contains the main discussion of the study's methodology. It expands upon the summary of the study design and data sources found in the main body of this report.

Survey design and questions

We conducted the three survey waves using a paper questionnaire that was designed to be completed by respondents with minimal assistance within 10 minutes. The version of the questionnaire we used for the first wave of the survey in March 2018 consisted of 23 main questions covering travel-to-work patterns, job details, stress and satisfaction levels, household composition and various demographic indicators. The same questionnaire, with only minor additions and adjustments, was used in September 2018 and March 2019. See Appendix D for copies of all three versions of the questionnaire.

We tested the first version of the questionnaire with students, friends and family, and in a training workshop with union members. We also tested the minor revisions we made to the Wave 2 and Wave 3 versions of the questionnaire, with all changes discussed and approved by the technical and steering committee members.

As is typical with questionnaires, despite our extensive testing, when we analyzed the data from Wave 1 of the survey, we had some insights on to improve the questionnaire. Most of the changes we made to the survey before launching the latter two waves were done to improve the readability of wording. However, we also made formatting changes, such as removing a page break that divided a related section of questions, or moving questions about arrival and departure times closer together. Changes made between the first and second waves of the survey are listed in Table 43.

This second version of the questionnaire, which had 25 main questions, also reflected feedback from the steering and technical committee members, which including the desire for a deeper understanding of the reasons why employees did not take up a transit subsidy when it was available to them. To that end, an open-ended question was added. Committee members were also interested in collecting employees' general input on TransLink's services and on the cost of employee parking, so questions were added to capture that data.

Table 43: Changes to questionnaire for Wave 2

Q#—Wave 2	Variable	Change	Reason
4a	Travel subsidy	Added open-ended question	Collect data on reasons for not adopting subsidy
6a	Time left home	Changed question wording	Improve readability
6b	Time arrived at work	Changed order and wording—was previously 6d	Improve readability
6c	Regularity of shift start time	Changed order, previously 6e	Improve readability
6d	Mode to work	Changed order, previously 6b	Improve readability
6e	Other trip purpose to work	Changed order, previously 6c	Improve readability
7	Day last worked	Changed question wording	Improve readability
7a	Time left work	Changed question wording	Improve readability
7b	Regularity of shift start time	Changed order and wording, previously 7b	Improve readability
7c	Time arrived at home	Changed order and wording, previously 7e	Improve readability
7d	Mode to home	Changed wording and order, previously 7c. Added parking cost question.	Improve readability and collect parking expense data
7e	Other trip purpose to work	Previously 7d and changed question wording	Improve readability
8	Days worked of last week	Changed question wording	Improve readability
10	Transit to hotel	Added question	Increase clarity of perceived ease of access to hotel by transit
17	Language	Added question	Supplement information and aid analysis of the ethnicity question
18	Gender	Changed question format from open- to close-ended	Improve readability and clarity
22	Household composition and size	Changed question wording	Improve readability
End	Date survey completed	Added to the end	Increase clarity of data relating to questions of the date
Comment section	Comment	Added question	Collect open-ended remarks on transit or the survey

Table 44 summarizes our revisions to the third version of the questionnaire. These were very minor. The main addition was to revise the wording of a question on subsidy acceptance so that it asked respondents to give reasons for accepting the subsidy as well as for not accepting it. Other changes were mainly aimed at improving readability and the logical flow of questions, especially regarding departure and arrival times.

Table 44: Changes to questionnaire for Wave 3

Q#—Wave 3	Variable	Change	Reason
4a	Travel subsidy	Expanded to ask reason for accepting subsidy	Collect data on reasons for accepting the subsidy
5c	Payment method	Added option	Wanted to capture autoload responses
6c	Shift start time	Added question	Seeking further clarification of shift start time versus arrival time
6d	Regularity of shift start time	Changed order, previously 6c	Improve readability of question
6e	Mode to work	Changed order, previously 6d	Improve readability
6f	Other trip purpose to work	Changed order, previously 6e	Improve readability
7a	Shift end time	Added question	Collect and clarify data on shift end time versus departure time
7b	Regularity of shift end time	Changed question wording	Improve readability
7c	Time left work	Changed order, previously 7a	Improve readability
7d	Time arrived at home	Changed order, previously 7c	Improve readability
7e	Mode to home	Changed order, previously 7d	Improve readability
7f	Other trip purpose to work	Changed order, previously 7e	Improve readability
8	Days worked of last week	Changed question format	Apply uniform format to similar questions
13a	Other job or jobs	Changed question wording	Improve readability
22	Household composition and size	Changed question wording and format	Improve question readability and accuracy of responses

Survey procedures

In the first wave of the survey, we offered all potential respondents a $10 gift card as an incentive and thank you. For the latter two waves, to keep participation high, we increased that incentive at the hotels where the subsidy was not offered or had not increased (hotels C, D and G) by offering potential respondents two $10 gift cards.

As per the approved ethics protocols, in all cases, we provided the gift cards after potential respondents completed the consent form so that they continued to have the option of declining to complete the survey after they had given their initial consent.

When respondents requested help, our student research assistants helped them to complete the survey. We also had research assistants inform respondents that they were allowed to request help completing the questionnaire from trusted friends, family, co-workers and managers.

Survey schedule

Reference day is a core concept embedded in the survey. The *reference-to-work day* was typically the day on which the respondent received the survey. The questions about how the respondent got to work refer to this day. The *reference-to-home day* was the most recent day before the reference-to-work day on which the respondent worked. The questions about how the respondent got home from work refer to this day. Hence it was important, though not always practically possible, to survey respondents at each of the study hotels on both weekdays and weekend days.

Before launching the first wave of the survey, we consulted with management at each hotel to learn about their busy and slow times, as well as the start and end times of different shifts and groups of workers. We also consulted with Unite Here Local 40 regarding the best times to reach workers. We considered these factors and strove to reach the maximum number and type of workers, while respecting each hotel's operational needs and limits. These included their typical high check-in and check-out days and their varying staff and space capacities. We adjusted our schedule according to operational needs for each subsequent wave of the survey. For Wave 1, we hired eight research assistants. Of these, six continued working in Wave 2, and we hired six additional research assistants (for a total of 12 in each of waves 2 and 3) with the goal of increasing our survey hours at each hotel. The dates and times for each shift for all three survey waves are in Table 45.

Table 45: Dates and times of survey recruitment

Hotel	Wave 1	Wave 2	Wave 3
A	Tues., Mar. 13: 7 a.m. to 5 p.m. Wed., Mar. 14: 11 a.m. to 2 p.m. Thurs., Mar. 15: 4:30 p.m. to 7:30 p.m.	Tues., Sept. 11: 7 a.m. to 9 p.m. Wed., Sept. 12: 7 a.m. to 11 a.m. Sat., Sept. 15: 10 a.m. to 2 p.m. Thurs., Sept. 20: 3:30 p.m. to 7:30 p.m.	Tues., Mar. 12: 6 a.m. to 9 p.m. Wed., Mar. 13: 7 a.m. to 11 a.m. Sat., Mar. 16: 9 a.m. to 1 p.m. Thurs., Mar. 28: 3:30 p.m. to 7:30 p.m.
	# of survey hours: 16	**# of survey hours: 26**	**# of survey hours: 27**
B	Thurs., Mar. 22: 7 a.m. to 9 p.m.	Thurs., Sept. 27: 6 a.m. to 9 p.m. Sat., Sept. 29: 10 a.m. to 6 p.m.	Tues., Mar. 19: 6 a.m. to 9 p.m. Thurs., Mar. 21: 4:30 p.m. to 8:30 p.m. Sat., Mar. 30: 10 a.m. to 6 p.m.
	# of survey hours: 14	**# of survey hours: 23**	**# of survey hours: 27**
C	Fri., Mar. 2: 10:45 a.m. to 1:45 p.m. Thurs., Mar. 8: 1 p.m. to 4 p.m. Sun., Mar. 18: 11 a.m. to 2 p.m. Mon., Mar. 26: 7:30 a.m. to 10:30 a.m.	Fri., Sept. 7: 7 a.m. to 9 p.m. Sat., Sept. 8: 10 a.m. to 2 p.m. Mon., Sept. 10: 7:30 a.m. to 11:30 a.m. Thurs., Sept. 13: 3 p.m. to 7 p.m.	Thurs., Mar. 7: 7 a.m. to 9 p.m. Sat., Mar. 9: 10 a.m. to 2 p.m. Fri., Mar. 22: 7:30 a.m. to 11:30 a.m. Tues., Mar. 26: 3 p.m. to 7 p.m.
	# of survey hours: 12	**# of survey hours: 26**	**# of survey hours: 26**
D	Thurs., Mar. 1: 7 a.m. to 9 p.m. Fri., Mar. 2: 7 a.m. to 11 a.m. Wed., Mar. 7: 1:30 p.m. to 3:30 p.m. Thurs., Mar. 8: 6 p.m. to 9 p.m.	Wed., Sept. 5, 7 a.m. to 9 p.m. Thurs., Sept. 6: 6 a.m. to 10 a.m. Sat., Sept. 8: 4 p.m. to 8 p.m. Mon., Sept. 10: 11:30 a.m. to 3:30 p.m.	Tues., Mar. 5, 7 a.m. to 9 p.m. Wed., Mar. 6: 7 a.m. to 11 a.m. Sat., Mar. 9: 4 p.m. to 8 p.m. Thurs., Mar. 21: 11:00 a.m. to 3:00 p.m.
	# of survey hours: 23	**# of survey hours: 26**	**# of survey hours: 26**

Hotel	Wave 1	Wave 2	Wave 3
E	Mon., Mar. 4: 8 a.m. to 11 a.m. Tues., Mar. 6: 12 p.m. to 3 p.m. Fri., Mar. 9: 8 a.m. to 11 a.m. Sat., Mar. 10: 12 p.m. to 3 p.m. Wed., Mar. 21: 6 p.m. to 9 p.m.	Thurs., Sept. 6: 4 p.m. to 8 p.m. Wed., Sept. 12: 11:30 a.m. to 3:30 p.m. Tues., Sept. 18: 7 a.m. to 11 a.m. Sat., Sept. 22: 9 a.m. to 1 p.m.	Wed., Mar. 6: 4 p.m. to 8 p.m. Fri., Mar. 15: 11:30 a.m. to 3:30 p.m. Sat., Mar. 23: 9 a.m. to 1 p.m. Thurs., Mar. 28: 7 a.m. to 11 a.m.
	# of survey hours: 15	**# of survey hours: 16**	**# of survey hours: 17**
F	Tues., Mar. 6: 12 p.m. to 3:30 p.m. Wed., Mar. 7: 12 p.m. to 3:30 p.m. Thurs., Mar. 8: 8:30 a.m. to 11:30 a.m. Sat., Mar. 10: 12 p.m. to 3:30 p.m.	Fri., Sept. 14: 7 a.m. to 11 a.m. Sat., Sept. 15: 11:30 a.m. to 3:30 p.m. Wed., Sept. 19: 4:30 p.m. to 8:30 p.m. Thurs., Sept. 27: 8 a.m. to noon	Thurs., Mar. 14: 7 a.m. to 11 a.m. Sat., Mar. 16: 1:30 p.m. to 5:30 p.m. Wed., Mar. 20: 4:30 p.m. to 8:30 p.m. Tues., Mar. 26, 8 a.m. to 12 p.m.
	# of survey hours: 13.5	**# of survey hours: 16**	**# of survey hours: 16**
G	Mon., Mar. 5: 7 a.m. to 10 a.m. Mon., Mar. 12: 7 a.m. to 10 a.m. Tues., Mar. 13: 12 p.m. to 3 p.m. Wed., Mar. 14: 12 p.m. to 3 p.m.	Thurs., Sept 20: 4 p.m. to 8 p.m. Sat., Sept. 22: 1 p.m. to 5 p.m. Mon., Sept. 24: 7 a.m. to 11 a.m. Wed., Sept. 26: 7 a.m. to 11 a.m.	Thurs., Mar. 14: 4 p.m. to 8 p.m. Wed., Mar. 20: 7 a.m. to 11 a.m. Sat., Mar. 23: 1 p.m. to 5 p.m. Wed., Mar. 27: 11 a.m. to 3 p.m.
	# of survey hours: 12	**# of survey hours: 16**	**# of survey hours: 16**
	Total hotel survey hours: 105.5	**Total hotel survey hours: 149**	**Total hotel survey hours: 155**

Before launching each wave of the survey in each hotel, we provided text and posters to the management and union, so they could alert their employees and members that we would be on-site, and to explain that participation in the survey was both encouraged and voluntary. A few days before the launch of the second and third waves of the survey at each hotel, we emailed respondents who had provided us with their email addresses for that purpose to let them know when we would be on-site.

In the four larger hotels, our survey teams were able to set up in staff cafeterias for all three waves. The other three hotels, which are smaller, do not have staff cafeterias, so instead our teams set up in banquet rooms or near break rooms. We put signs on our survey tables explaining who we were, what the study was about and that survey respondents would receive a gift card. Research assistants were trained to greet people who passed by or approached, briefly explain the study and questionnaire to them and inviting them to participate.

Typically, there were teams of two research assistants present at our survey tables. For all three waves, we were able to schedule a long (7 a.m. to either 5 p.m. or 9 p.m.) first day at the larger hotels. When that happened, the project manager was also on-hand for the whole day, and the principal investigator was present for part of each of those days as well. In a few cases at the smaller hotels during the latter part of the survey period, a research assistant did all or part of a survey shift alone.

At the larger hotels and during peak and break times, it was common to have anywhere from four to eight people, and occasionally many more, filling out the questionnaire at once. Research assistants were trained and expected to be alert for anyone who might have difficulties.

In the vast majority of cases, surveys were completed on the spot or returned a short time later on the same day. However, we did make arrangements with each hotel so that employees could take an envelope away with them and return the completed survey in the sealed envelope to their human resource office or front desk later. This made it possible for people who did not have time to do the survey when our teams were on-site to complete their surveys at a later date. We also offered stamps to people in case they preferred to mail us the questionnaire; a small number of respondents chose this option.

Consent forms and surveys were matched using a unique ID number, with names and contact information appearing only on consent forms. Completed consent forms and surveys were stored separately while at the hotels and at Simon Fraser University, where they were kept in a locked drawer in a locked office.

Data entry procedures

Before each wave of data entry began, we had training sessions for the research assistants. At these sessions, they were introduced to the code sheet prepared by the principal investigator, which explained how to input each variable and what to do in case of missing or unusual data. Research assistants were also instructed in when and how to let us know that the data required review. Training also included live practice sessions where research assistants entered survey data into prepared Excel templates under supervision.

Data cleaning procedures

After completion of the data entry, cleaning took place in three stages. First, we reviewed all cells that had been coded as in need of review and the reasons for flagging them. This resolved most questions and errors. Then, we compared the master survey spreadsheet against the paper documents. Finally, we imported the survey data into the SPSS Statistics software package and conducted basic logic tests to identify and resolve minor discrepancies.

Data analysis and variable creation procedures

In SPSS, we proceeded with variable creation and analysis. In addition to the 135 separate variables entered directly from the Wave 1 survey itself, we created more than 50 new variables, for example, by recoding continuous variables into categorical variables. The Wave 2 survey consisted of 142 separate variables, to which we added about 90 created variables. For Wave 3, we had 145 separate variables, to which we added over 100 created variables. To make results comparable across waves, we retroactively added created variables to the datasets for prior waves and included them in the analysis as applicable. We have explained our methods for the most frequently used of these newly created variables below.

Job class

Respondents were asked to indicate which of 23 pre-coded jobs they held at the study hotel, with the option of indicating more than one job title. We consulted human resource managers and union representatives to make sure we chose correct and comprehensive terminology, but nevertheless, respondents also had space to write in another job title if none of the pre-coded titles fit. During data cleaning, we were able to associate most written-in job titles with the pre-coded job titles. We then placed respondents in one of five job categories or classes if they indicated employment only in the job titles associated with that class. These, along with the job titles that we assigned to each class, are listed in Table 46. The sixth category was for those respondents who gave job titles in two or more classes (for example, food service and housekeeping), as well as those who did not respond to this question. The percentage of workers in each job class in each wave can be found in the frequency tables in Appendix K.

Table 46: Job titles and classes

Job class	Constituent job titles
Housekeeping	housekeeping, room attendant
Food & beverage	banquet, bartender, bar server, restaurant server, steward, host, room service
Front of house	front desk, concierge, bellperson, parking, telephone
Back of house	engineering, laundry, janitorial, dishwasher, cook, night cleaner, security
Management and admin.	management, office administration
Multiple/unknown	

Living in the downtown Vancouver core and subregion of residence

Since most respondents provided their full postal code, we were able to identify which of them live within the downtown core using the first three digits of their postal code (i.e., their forward sortation area or FSA). We also defined a downtown Vancouver core area using five FSA postal code areas. This area consists of the Vancouver downtown peninsula west of Carrall Street. This area is essentially identical to the definition of downtown Vancouver used by TransLink to calculate Compass Card usage statistics.

Table 47: Definition of downtown core, based on FSA

Area	FSA
Downtown Vancouver core	V6G, V6E, V6Z, V6C, V6B
Other areas	V2W, V2X, V2Y, V3B, V3C, V3E, V3H, V3J, V3K, V3L, V3M, V3N, V3R, V3S, V3T, V3V, V3W, V3X, V3Y, V3Z, V4A, V4C, V4E, V4G, V4I, V4K, V4M, V4N, V4P, V5A, V5B, V5C, V5E, V5G, V5H, V5J, V5K, V5L, V5M, V5N, V5P, V5R, V5S, V5T, V5V, V5W, V5X, V5Y, V5Z, V6A, V6H, V6J, V6K, V6M, V6P, V6R, V6S, V6V, V6W, V6X, V6Y, V7A, V7C, V7E, V7G, V7H, V7J, V7L, V7M, V7P, V7R, V7S, V7V

Housing stress

The price and availability of housing in the Vancouver region is one cause of long commutes, and hence may also influence commute mode choice. The housing stress

calculation provides a conservative indicator of whether the respondent's current housing arrangement is affordable. It is based on the premise that when a household spends more than one-third of gross household income on shelter costs, they are considered to be in unaffordable housing.

The categories for the before-tax annual household income question were chosen to be comparable with other transportation surveys. Based on these, the categories for the housing spending per month question were chosen to allow easy calculation of the housing stress indicator. For example, a household with an annual income of up to $25,000 would earn no more than $2,083 per month. If they spend more than $694 (rounded up to $700 for the survey), we considered them to be housing stressed. In practice, some households with incomes below $25,000 may also be housing stressed when spending less than $700 per month, so this threshold is regarded as conservative.

Days of the week worked

Based on wave 1 and 2 responses about their work pattern over the previous seven days, we classified employees into three mutually exclusive groups: in Wave 1, a small number of respondents did not work in the previous seven days, and a few (2.8%) worked only on weekends. However, more than half of hotel employees reported that they worked on both weekends and weekdays. Two-fifths of employees reported working on Saturday (39.6%) and Sunday (40.1%) in the previous seven days. In this respect, hotel workers, even those with regular shifts and morning start times, represent a distinct category of downtown commuters, probably more like other hospitality and retail workers than office workers. In Wave 2, similar proportions reported working weekdays only (41%), weekdays and weekends (49%), and weekends only (5%).

Regular shift start and end times

A factor that may influence uptake of the transit subsidy is the regularity of shifts. we were able to identify whether employees have regular shift start and end times based on responses to questions about their start and end times on the reference days.

Leaves home and returns between 6 a.m. and 9 p.m.

TransLink provides Metro Vancouver with a frequent transit network (FTN) of services that run from 6 a.m. to 9 p.m. every weekday. During these hours, transit service is expected to be available at least every 15 minutes in both directions, whether by bus SkyTrain, SeaBus or a combination of these. On Saturdays, FTN service began at 7 a.m. and on Sundays at 8 a.m.[193]

Due to their shift schedules, some workers needed to travel at hours that this FTN level of service was not available, and this may influence their uptake of the transit subsidy. To better understand when workers were travelling, we developed this variable, using the hours of TransLink's FTN. See Appendix K for frequencies.

[193] TransLink, "Frequent Transit Network."

Off-peak travel

TransLink's fares differ based on time of day travelled, type of transit service and zone travelled. Buses cost the same amount (a one-zone fare, valid for 90 minutes of transfer time) regardless of the time of day or number of zone boundaries crossed.[194] To travel on the SkyTrain and SeaBus, riders have to pay a one-, two- or three-zone fare depending on how many zone boundaries they cross. However, only a one-zone fare is required to use those services during off-peak hours, which are after 6:30 p.m. on weekdays and all day on weekends and holidays.[195]

Since TransLink charges only one-zone fares on SkyTrain trips during off-peak hours, employees who travel during those hours may be more interested in a less expensive one-zone monthly transit pass, regardless of the number of zones they pass through between their homes and workplaces. We therefore created the "off-peak travel" variable, which indicates employees who left home or work between 6:30 p.m. and 1:00 a.m. on weekdays.

Commute class

This variable combines mode of travel to work and mode of travel back home to compare non-auto and auto-involving commuters, based on seven mutually exclusive sub-classes. The mode "walked part way" was not included in this classification because we assumed that most trips by modes other than driving involved some walking. See Appendix K for further details about the characteristics of respondents in each the commute classes.

Table 48: Commute class variable description

Class	Sub-class
Non-auto	Transit-only (transit bus, SkyTrain, SeaBus, West Coast Express)
	Walk-only
	Bike-only
	Combined (2+ of) transit, walk, bike
	Subtotal—all non auto-involving
Auto (auto-driver, auto-passenger, taxi, motorcycle)	Auto-only
	Auto and transit
	Auto and other
	Subtotal—all auto-involving

Note: non-responses (0.7% of respondents) removed.

Commute time

We calculated commute time in minutes for the journey to work (the time arrived at work less the time left home) and to home (the time arrived at home less the time left work),

[194] In March 2018, adult cash fares were as follows: one-zone: $2.85; two-zone: $4.10; three-zone: $5.60. The price of adult monthly passes was as follows: one zone: $93; two-zone: $126; three-zone: $172. On July 1, 2018, fares increased so that in September 2018, adult cash fares were as follows: one-zone: $2.95; two-zone: $4.20; three-zone: $5.70. The price of adult monthly passes was as follows: one zone: $95; two-zone: $128; three-zone: $174.
It is also possible to purchase tickets in advance through the "stored value" option on a Compass Card, which provides a discount on single tickets. For more information, including rates for concession tickets and passes, see TransLink, "Fare Pricing," https://www.translink.ca/Fares-and-Passes/Fare-Pricing.aspx.

[195] The fare structure for early morning travel is the same as for the rest of the weekday before 6:30 p.m.

differentiating all nonstop journeys from journeys without stops. After inspecting the initial results, we corrected or removed outliers (defined as those reporting a travel time without stops of more than three hours).

FTN score and transit segments

For purposes of analyzing relative access to transit, we have used a score based on the number of transit stops that have a level of service that is at least as frequent as the standard for TransLink's FTN. We calculated this score per postal code of residence and then arrayed the scores into quartiles of FSAs. Table 49 indicates that employees are more likely to live in parts of the region that have higher levels of transit service.

Table 49: Categorization of hotel employees by quartile of FTN score (waves 1 and 2)

FTN score	Representative neighbourhoods	Wave 1 %	Wave 2 %	Wave 3 %
Upper quartile	Downtown and East Vancouver (CoV), City of North Vancouver, Surrey Central	43.8	43.2	43.2
Third quartile	South Vancouver (CoV), Burnaby, New Westminster	34.3	35.3	34.8
Second quartile	Surrey South, Richmond Central, Maple Ridge, Delta	17.1	16.8	16.8
Lower quartile	West Vancouver, Surrey West, South Richmond, White Rock, Langley	4.8	4.7	5.1
Total		**100**	**100**	**100**

Based on feedback from study partners, we also calculated the number of transit changes involved in commuting from each FSA to the centrally located Burrard Station (for more details, see Appendix C). Changes during a transit journey are thought to be a major impediment to the use of transit. We determined that almost 90% of respondents lived in FSAs that required either no changes or only one change to commute by transit.

Table 50: Number of transit changes from FSA to Burrard Station

Number of transit changes	Wave 1 %	Wave 2 %	Wave 3 %
No change	45.5	45.0	47.4
One change	43.8	44.5	41.6
Two changes	10.1	10.4	10.7
Three changes	0.6	0.2	0.3
Total	**100**	**100**	**100**

Transit main payment mode (recoded)

This is a single variable (PAYTRANSIT) with six attributes derived from eight separate questions about how transit users paid for their travel. In some cases, respondents indicated more than one mode of payment across these questions. In most cases the multiple responses were consistent with a single Compass Card, for example, a combination of a monthly pass product and cash or stored value. In a small number of cases they indicated more than one pass product, which would mean having more than one Compass Card during a given month. Although it is possible that these respondents had two

or more cards on which they maintained different pass products, we assumed instead that these were users who recently changed pass products, hence they indicated more than one. Since the purpose of this variable was to examine the relation between pass product and subsidy acceptance (and other mediating and outcome variables), we chose to be conservative in allocating contradictory responses to pass products most associated with the transit subsidy.

Therefore, we first associated each person who had a concession monthly pass, West Coast Express monthly pass or U-Pass BC with the category (4) other pass. We then associated each person who had a zone pass with that zone pass, moving from three to one zone in the categories (3) three-zone, (2) two-zone and (1) one-zone monthly pass. In other words, if a respondent indicated three- and one-zone passes, they would be associated with a three-zone pass for this variable. We then associated each person who indicated that they paid cash or stored value (without having any monthly pass) with (5) cash/stored value only. The remaining respondents were assigned to (6) none.

Coding open-ended questions on subsidy acceptance and general comments

At the suggestion of the study partners, and once the first wave survey had confirmed that the questionnaire was not onerous for respondents, we used the second wave of the survey as an opportunity to explore the motivations of those who did not take up a subsidy that was offered to them, using two open-coded survey questions. On the first page of the survey, in Wave 2, we asked respondents who had been offered a transit subsidy but had not accepted it the reason for not accepting. For Wave 3, respondents were asked for their reasons for accepting or not accepting the subsidy offer, as applicable.

On the last page of the questionnaire, we invited respondents to make any comments they wished about their travel to work or the survey itself and provided several blank lines on which to do so.

We coded the responses to these open-ended questions into the categories identified in Table 51. The categories were created through successive rounds of open coding and refinement, involving the research assistants, project manager and principal investigator. We considered responses from both waves 2 and 3 when creating the final coding categories.

Once the coding categories were finalized, two research assistants independently coded the full text of the responses to the open-ended question as to why the subsidy was not (in waves 2 and 3) or was (in Wave 3 only) adopted, with the principal investigator resolving any coding discrepancies. We coded responses in a binary format for each category, allowing the comments of the same respondent to be associated with more than one coding category. It should be noted that these comments were voluntary and unprompted. Hence, frequency counts for each category may be interpreted as an indicator of strongly held opinions.

Since many respondents also used the final comments to elaborate on their transit subsidy uptake or transit usage behaviour, we developed eight categories that were comparable between both open-ended questions. We created a further four categories for the reasons

for not taking up a subsidy (waves 2 and 3), and three categories for taking up the subsidy (for Wave 3 only). Finally, we created a further 10 categories for the final comments only.

Most of the latter was feedback—whether positive or negative, specific or general—on the state of transit services in the region. We include this feedback in Table 51 in hopes of providing valuable insights for TransLink and other transit planners.

Table 51: Coding categories for "reasons not accepting subsidy" and "final comments"

Variable name	Category+	Reason for not accepting (or accepting, Wave 3 only) subsidy	Final comments
RDRIVE **CDRIVE**	Drive	Assert they don't take subsidy because they use an auto (drive, are driven, carpool, taxi, etc.).	Comment about using auto (drive, are driven, carpool).
RPARK **CPARK**	Parking	Assert they don't take subsidy because parking is provided/incentivized.	Comment about parking near hotel or elsewhere on their commute.
RACTIVE **CACTIVE**	Active	Assert that they walk, cycle or similar (e.g., scooter).	Comment that they walk, cycle or similar.
RTRANSIT **CTRANSIT**	Transit	Assert they don't take subsidy because transit is not convenient (live too far or too close, takes too long, late, unreliable, don't like transit).	Comment that transit is inconvenient in some way (note: may not necessarily be about not taking up subsidy).
RSCHEDULE **CSCHEDULE**	Transit schedule	Assert that they don't take the subsidy because of an issue related to the transit schedule (examples: hours of service limitations, transit does not start early/go late enough/ frequently enough on the weekends for their work schedule).	Comment that the transit issue is in relation to the transit schedule (examples: hours of service limitations, transit does not start early/go late enough/ frequently enough on the weekends for their work schedule).
RUNAVAIL **CUNAVAIL**	Subsidy unavailable	Assert that the subsidy is not offered to them, or they are not eligible for the subsidy (new employee, not in union, part-timer, manager).	Comment that the subsidy is not offered to them, or they are not eligible for the subsidy (new employee, not in union, part-timer, manager).
RINCON **CINCON**	Subsidy inconvenient	Assert that there is some barrier with the way the subsidy is set up (sign-up period, paperwork, zone requirements, do not work enough, deadlines, contract is too long, contract is not conducive with vacation or time off, felt it was a hassle, that they did not know about or haven't looked into the subsidy).	Comment that some barrier with the way the subsidy is set up (sign-up period, paperwork, zone requirements, do not work enough, deadlines, contract is too long, contract is not conducive with vacation or time off, felt it was a hassle, that they did not know about or haven't looked into the subsidy).

Variable name	Category+	Reason for not accepting (or accepting, Wave 3 only) subsidy	Final comments
RUSAGE CUSAGE	Transit usage	Assert that they do not use transit enough or make enough trips on transit to make the subsidy or monthly pass worth it (examples: they are multi-modal—sometimes use transit, drive, carpool or use active modes of travel).	Comment that they do not use transit enough.
RPASS	Pass	Assert that they have another pass (e.g., U-Pass).	n/a
RSECONDJOB	Other job/activities	Assert that there is a second job, other activities, responsibilities, before or after work that affects their use of a subsidy.	n/a
RWILLTAKEUP	Will take up	Assert that they intend to take up the subsidy.	n/a
RUNCODED	Non-coded	Statement does not fall within one of the coded categories.	n/a
RPSAVINGS (Wave 3 only)	Subsidy saves money	State that they took the subsidy because of the perceived financial savings.	n/a
RPALREADY (Wave 3 only)	Already commuting	State that they took the subsidy because they were already commuting by transit.	n/a
RPPROCESS (Wave 3 only)	Subsidy convenient	State that they took the subsidy because of the pass convenience and/or the administrative ease (i.e., easy to sign up, deduction payment, no need to worry about getting a new pass).	n/a
RPOTHER (Wave 3 only)	Subsidy other	Any other positive reason for why they took the subsidy (e.g., such as time savings, traffic congestion, environmental concern, etc.).	n/a
TPOS	Comment: positive transit experience	n/a	Comment about a positive experience with transit or that they like the way transit is currently formatted, being constructed or being developed.
TNEG	Comment: negative about transit	n/a	Comment about a negative experience with transit or that they do not like the way transit is currently formatted, being constructed or being developed.
COTHER	Comment: other	n/a	Comment is neither positive or negative about transit or

Variable name	Category+	Reason for not accepting (or accepting, Wave 3 only) subsidy	Final comments
			is unrelated to transit.
CFARE	Comment: transit fare	n/a	Comment that the fare is too expensive.
CCONSTRUCTION	Comment: construction maintenance	n/a	Comment that there was an issue with construction (including roads) or with a station improvement.
CTRAFFIC	Comment: traffic	n/a	Comment that there was an issue with traffic.
CCAPACITY	Comment: transit capacity	n/a	Comment regarding transit capacity (full buses or SkyTrains, pass-ups, need more buses, or need more bus routes).
CLATE	Comment: transit late	n/a	Comment that lateness of the bus or SkyTrain was problematic
CSAFETY	Comment: transit safety	n/a	Comment that they felt unsafe or there was an issue with noise, heating or toilets on the transit system.
CREQUEST	Comment: new or updated infrastructure requested	n/a	Comment suggesting or showing excitement for some form of new transit or transportation infrastructure.

Coding responses to ethnicity and language questions

In all three waves of the survey, we asked respondents an open-ended question about which ethnic background they most identified with. After entering and cleaning the Wave 1 responses to this question, we found that resulting data was still too unwieldy to be analyzed. It was also not practical to convert the question to a close-ended format from Wave 2, and so, in consultation with study partners, we decided to add a question about language first learned at home (following the wording in the 2016 Census) to help clarify and analyze the ethnicity responses.

First language

We added the question, "What is the language that you first learned at home in childhood and still understand?" to the questionnaire for the first and second waves. We coded responses as one of the following: English as first language, French as first language, both (English and French) as first languages, neither (English nor French) as first languages, or missing.

If a respondent answered with English or French, as well as another language, we assumed that both were first languages, since languages can be learned simultaneously, and we coded this respondent as having English or French as a first language.

In cases where a respondent had moved to Canada after age 18 and had indicated an ethnicity that we had already been able to code as "visible minority," but did not give a first language, we coded them as having neither English or French as a first language. However, since many people from India and Africa speak English as a first language, if a respondent gave their ethnicity as East Indian, African, or Asian (including Singaporean, Fijian, Chinese or Hong Kongese), we did not assume that English was not a first language. In cases where the respondent gave Vietnamese as an ethnicity and did not provide a language, we coded the data as missing, since the person may have learned French as a first language.

Ethnicity

After the final wave of the survey was complete and we had reviewed responses to the ethnicity question collected during the previous two waves, we decided that the best path forward was to code respondents into three main categories so that we could easily compare our data with census data, following Statistics Canada definitions of these terms. These three categories are: visible minority, non-visible minority and Aboriginal.[196]

Where the respondent did not answer this question, we did sometimes assign ethnicity based on the answer given to our language question, but with caution. For example, if a respondent had said their first language was English, Portuguese, Spanish or French but did not give an ethnicity, we left this as missing data.

For respondents who gave "Canadian" as a response to this question, and also gave (in waves 2 and 3) a non-European first language, such as Chinese, we coded them as a visible minority. However, if they did not give another language, we considered this missing data because we could not determine whether someone was a visible minority solely on the ethnicity of "Canadian."

For respondents who gave Canadian as their ethnicity and also (in waves 2 and 3) gave a language that is not widespread outside of Europe, such as Polish, Romanian or Macedonian, we coded them as non-visible minority.

Response rates and survey weights at each hotel

In Wave 1 (see Table 52), we collected a total of 807 consent forms and 774 completed surveys, for an overall response rate of 40% of hotel employees. There were only 33 cases in which a person filled out a consent form and collected the gift card but did not return a completed survey to us, for a non-return rate of 4%. Given that people were free to take the

[196] According to Statistics Canada, "Visible minority refers to whether a person belongs to a visible minority group as defined by the *Employment Equity Act* and, if so, the visible minority group to which the person belongs. The *Employment Equity Act* defines visible minorities as 'persons, other than Aboriginal peoples, who are non-Caucasian in race or non-white in colour'. The visible minority population consists mainly of the following groups: South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, West Asian, Korean and Japanese. The 'Not a visible minority' category includes persons who gave a mark-in response of 'White' only; persons who gave mark-in responses of 'White and Latin American', 'White and Arab' or 'White and West Asian' only; persons who gave a mark-in response of Latin American, Arab, or West Asian only, along with a European write-in response; and persons with no mark-in response who gave a write-in response that is not classified as a visible minority. As indicated previously, this category also includes Aboriginal persons." Statistics Canada, "Visible Minority of Person," Statistics Canada, December 2, 2015, http://www23.statcan.gc.ca/imdb/p3Var.pl?Function=DEC&Id=45152.

gift card after completing the consent form and that the voluntary nature of the survey was explained both verbally and in writing on the consent form, this indicates a high level of willingness to participate in the study.

The survey response rate at each hotel ranged from 28% to 63%. In general, the response rates were higher at the smaller hotels, reflecting the goal of the project team to recruit a representative sample at each hotel (defined as a minimum of 40 respondents per hotel). Also, as noted above, we got more responses from some hotels because the place and time of surveying were more convenient for employees. This means that the probability of selection varied from hotel to hotel.

It was thus appropriate to apply a population weight to respondents in each hotel to make sure the results are representative of all hotel employees. The weights, shown in the right-most column, have been applied to all results presented in this report unless otherwise noted, so that numbers and percentages in tables represent hotel employees as a whole, not just survey respondents.

Table 52: Response rates and survey weights at each hotel, Wave 1

Hotel	Total employees Mar. 2018[197]	Consents received	Consent response rate %	Surveys received	Survey response rate %	Weight
A	425	205	48	195	46	2.18
B	475	138	29	135	28	3.52
C	309	107	35	97	31	3.19
D	458	193	42	187	41	2.45
E	90	55	61	52	58	1.73
F	93	60	65	59	63	1.58
G	78	49	63	49	63	1.59
Totals	**1,928**	**807**	**42**	**774**	**40**	

The Wave 2 survey was even more successful than the first wave. The survey response rate increased to 43%, with a minimum of 57 valid responses per hotel and slightly less variation in the response rate per hotel (32% to 69%). Hence, the weights for Wave 2 are less variable.

[197] Employment levels in the hotel industry do vary by season and business conditions. Estimated total employees at the time of the survey are taken from the human resource indicators spreadsheets provided to the research team by the hotels, and in one case from an interview with hotel management.

Table 53: Response rates and survey weights at each hotel, Wave 2

Hotel	Total employees Sept. 2018[198]	Consents received	Consent response rate %	Surveys received	Survey response rate %	Weight
A	472	184	39	170	36	2.78
B	501	247	49	240	48	2.09
C	309	149	48	139	45	2.22
D	539	183	34	174	32	3.10
E	91	60	66	57	63	1.60
F	104	65	63	63	61	1.65
G	86	60	70	59	69	1.46
Totals	**2,102**	**948**	**45**	**902**	**43**	

The response rate for Wave 3 was similar to Wave 2 in that it increased where we increased the gift card incentive and elsewhere decreased from Wave 1. Hotel E, where we did not change the incentive at any point, but did change the subsidy level between waves 1 and 2, was the exception to this pattern. The survey response rate for all hotels for Wave 3 was 44% (up from Wave 1 and steady with Wave 2), this time with a minimum of 49 valid responses per hotel and the survey response rates varying from 33% to 67%.

Table 54: Response rates and survey weights at each hotel, Wave 3

Hotel	Total employees Mar. 2019[199]	Consents received	Consent response rate %	Surveys received	Survey response rate %	Survey weight
A	463	184	40	171	37	2.71
B	506	256	51	253	50	2.00
C	311	159	51	147	47	2.12
D	511	173	34	170	33	3.01
E	87	51	59	49	56	1.78
F	109	56	51	56	51	1.95
G	88	59	67	59	67	1.49
Totals	**2,075**	**938**	**45**	**905**	**44**	

The consent and survey response rates for all waves are summarized in Table 55.

[198] Employment levels in the hotel industry do vary by season and business conditions. Estimated total employees at the time of the survey are taken from the human resource indicators spreadsheets provided to the research team by the hotels, and in one case from an interview with hotel management.
[199] Employment levels in the hotel industry do vary by season and business conditions. Estimated total employees at the time of the survey are taken from the human resource indicators spreadsheets provided to the research team by the hotels, and in one case from an interview with hotel management.

Table 55: Consent and response rates for all survey waves

	Consent response rates			Survey response rates		
Hotel	Wave 1 %	Wave 2 %	Wave 3 %	Wave 1 %	Wave 2 %	Wave 3 %
A	48	40	40	46	37	37
B	29	50	51	28	48	50
C	35	49	51	31	45	47
D	42	37	34	41	34	33
E	61	63	59	58	59	56
F	65	63	51	63	61	51
G	63	71	67	63	70	67
All	**42**	**46**	**45**	**40**	**44**	**44**

Human resources indicators and organizational interviews

While the purpose of the study was to better understand what, if any, effects transit subsidies of different levels would make to the commuting patterns of workers at the selected hotels, we knew that many other factors could also affect workers' commuting and travel choices. These could include changes to factors both beyond management control, such as weather, gas prices and transit service, as well as to those squarely within it, such as the introduction of policies that discouraged or incentivized certain commute modes. Such changes could also include alterations to schedules, duties or commute-related infrastructure, such as an expansion or reduction of parking spaces, showers or changing rooms, or even of management personnel.

To understand and account for as many of these external factors as was feasible, we asked the participating hotels to provide us with a set of standard monthly human resource indicators. These indicators included total employees, as well as number of union and management employees and number of employees receiving the subsidy, as well as data on applications received, absenteeism and lateness, and grievances and disciplinary measures. We were able to obtain complete sets of these from all hotels except Hotel G, which could only provide the data for a few months.[200]

A limitation of these human resource indicators is that not all hotels were in the practice of measuring or tracking these indicators in one standard or centralized way for their hotel. In some cases, it was not their practice to track the indicators at all before our request and in others, third parties were involved in the process of collecting or tracking the data. For these reasons, as well as to avoid exposing detailed hotel-specific operational data, we have not used this indicator data to make direct hotel-to-hotel comparisons. Instead, we used it to alert us to any trends or unusual changes in the indicators, and as a basis for discussion and review with hotel management and/or union representatives during the final organizational interviews.

To complement and supplement this quantitative data, we also asked each of the hotels to allow a manager to participate in three qualitative interviews about matters such as workplace organization and performance, commuting infrastructure and human resources

[200] Hotel G did not provide a transit subsidy to its workers before or during the study period.

policies. We also held these interviews with union members at each hotel, repeating the interviews at six-month intervals for the duration of the study. These interviews were held after the completion of each wave of the survey. We used a standard questionnaire to guide these interviews and asked respondents to answer the questions based on the previous six months at their hotel, with the aim of capturing any changes to policies, practices or infrastructure made just before or between the survey waves. For the Wave 3 of the survey, we also asked the managers and union members to reflect on the whole study period.[201]

A limitation on these interviews was that not everybody that we interviewed had equally complete knowledge. In the case of management, our contacts were senior managers who could answer questions about matters such as application and hiring trends, job performance, or system changes for the hotel as a whole. However, for the union interviews, our contacts were workers who, by nature of their position, could answer some questions based on their experience only in their own department. Nevertheless, we thought it was useful and important to collect perspectives from both managers and union members at each hotel through these interviews.

Predicted commute mode

This section provides the full explanation and steps for the discussion and conclusions about the subgroups of our study population that were unlikely to commute by transit regardless of subsidy level.

To address this question, we needed to differentiate and identify two groups of non-transit commuters—those who were likely to always choose active modes (walking, cycling or some combination), and those who were likely to always choose the auto mode. The policy goals of the city do not include shifting active commuters to transit.

At the same time, given that nine-tenths of hotel workers had used transit at least once in the past month, our classification had to recognize the mixing of modes, both within individual commutes (e.g., auto and transit), and also over time (e.g., transit to work, active back home).

Hence, we opted to create separate indices that show the likelihood that a person would opt for each of the three main modes (active, transit and auto). We then combined the three indices to create a single "predicted commute mode." In some cases, the index score for one mode would be clearly greater than the others, and so a single commute mode would be predicted; but in other cases, two (or in theory, even three) modes would have the same scores, and so the predicted commute mode would be multi-modal and/or more susceptible to change.

Once the predicted commute had been constructed, we compared it with the actual (reported) commute mode to identify the minimum and potential maximum population for each mode.

[201] For the third wave of the survey, there were two hotels for which we were unable to conduct interviews with unionized workers.

Step 1: Commute scores for each of three modes

The components of these commute scores were extracted from the findings of the study (especially the multivariate analysis), but we kept the number of index items small (four elements for each) to make it easier to understand and communicate our findings.

Table 56: Components of commute score for each mode

	Active mode	Transit mode	Auto mode
Four factors in the mode score; if present, the score is increased by 1, for a final score for each mode that is between 0 and 4	Male	Zone 2 residence	Have access to auto
	Downtown residence	No stops on commutes	Live in FSA with low FTN score
	No kids at home	Regular shifts	Stop to make drop-offs on way to/from work
	Non-regular shifts	Leave home and return between 6 a.m. and 9 p.m.	Two or more transit segments

The factors in the indices combined both barriers and incentives for each mode choice (for example, two or more transit segments, implying a transit change, was a deterrent to transit mode choices, while regular shifts during high transit service hours was an incentive to take transit). Note also that numerous other factors were considered for inclusion in the indices, but were rejected because they either did not sufficiently differentiate likely mode choice, or because of data availability. Important examples of these rejected variables include:

- Distance: short-distance commutes were associated with active modes but were captured by downtown residence. Long-distance commutes included both transit (e.g., a three-zone SkyTrain or B-line/express bus commute) and auto commutes, hence were also not included in any index.
- Income: although higher household income was associated with auto commuting, the non-response rate for this variable was relatively high, hence it was not included in the auto-commute index.
- Second jobs and/or attending school: while workers who had second jobs or attended school in the downtown core and/or on transit routes were more likely to commute by transit, only a relatively small proportion of hotel workers fell into either of these groups, hence this was not included in the transit commute index.
- Tenure: while renters were more likely to be active commuters, most renters chose other modes (especially transit), hence this variable was not appropriate for the active commute index.

Step 2: Identifying likely mode choice

Once a commute score had been calculated for each mode for each individual, we then combined them to generate a predicted commute mode choice. To get there, we had to determine what score threshold per mode would predict that the commuter would choose this mode over other modes. The following tables show that a commute mode score of at least 2 captured half or more of the commuters in terms of actual mode choice, with the exception of the "auto and other" mode choice.

Table 57: Active commute mode score by actual mode choice

Active score	Final revised commuter class							Total %
	Transit-only %	Walk-only %	Bike-only %	Combined transit, walk, cycle %	Auto-only %	Auto and transit %	Auto and other %	
0.00	19.7	0.5	4.6	0.0	12.1	18.8	4.3	15.8
1.00	44.5	6.8	10.8	9.0	42.9	40.4	25.5	39.7
2.00	27.7	33.4	36.9	51.3	35.6	31.4	42.6	30.9
3.00	7.9	42.4	32.3	34.6	8.9	9.5	23.4	11.7
4.00	0.2	16.9	15.4	5.1	0.5	0.0	4.3	1.8
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

A transit score of 2 or higher captures more than half of transit-only and auto-and-transit commuters, although this does also capture many auto-only and active commuters. This highlights that there is some fluidity in the choice set of potential transit commuters.

Table 58: Transit commute-mode score by actual mode choice

Transit score	Final revised commuter class							Total %
	Transit-only %	Walk-only %	Bike-only %	Combined transit, walk, cycle %	Auto-only %	Auto and transit %	Auto and other %	
0.00	2.3	5.8	3.8	2.4	3.7	4.7	8.5	3.2
1.00	15.9	27.8	30.2	39.0	25.1	25.8	21.3	20.6
2.00	37.3	43.9	41.5	48.8	43.6	38.2	48.9	39.7
3.00	34.0	22.1	24.5	9.8	22.1	26.1	21.3	28.9
4.00	10.4	0.5	0.0	0.0	5.5	5.2	0.0	7.6
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

An auto-commute score of 2 or higher captures at least half of auto-only and auto-and-transit commuters, and also differentiates these commuters from transit-only and active-only commuters. It does not identify auto-and-other commuters well, but this is a small group.

Table 59: Auto commute-mode score by actual mode choice

Auto score	Final revised commuter class							Total %
	Transit-only %	Walk-only %	Bike-only %	Combined transit, walk, cycle %	Auto-only %	Auto and transit %	Auto and other %	
0.00	24.9	70.3	41.5	69.1	2.5	8.0	51.1	22.3
1.00	42.3	26.6	39.6	26.5	23.3	26.3	33.3	34.4
2.00	25.1	2.5	15.1	4.4	40.6	39.8	4.4	28.1
3.00	7.3	0.5	0.0	0.0	28.5	22.5	11.1	13.4
4.00	0.3	0.0	3.8	0.0	5.1	3.5	0.0	1.8
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

In summary, a score of 2 or more on each commute mode index suggests that a commuter is more likely that not (that is, over 50% likely) to choose this mode. We use this simple rule to indicate whether a commuter was likely to choose this mode, and then in the third and final step we identify a predicted commute mode.

Step 3: Predicted mode choice

For each individual, we used their scores for the three separate commute modes to categorize them into seven mutually exclusive predicted mode choices, namely "transit," "active," "auto," "auto or transit," "active or transit," "auto or active," or "auto or active or transit." For example, if an individual had an active score of 1, a transit score of 2 and an auto score of 2, then they would be classified as "auto or transit." We could not classify 10.3% of respondents due to missing data.

Table 60 shows that while 31% of respondents are clearly predicted to be transit commuters, almost a fifth of respondents are potentially transit or active commuters, and another fifth are potentially auto or transit commuters. This points to the city's policy challenge (not unsurmountable) of encouraging switching from auto to transit commuting, without also causing active to transit switching. Only a relatively small group (6.3%) are clearly predicted as auto commuters, which is a positive finding for regional transport planning efforts since it suggests scope for reducing the share of auto-only commuting.

Table 60: Predicted commute class

Predicted commute class	Frequency	%	Valid %	Cumulative %
Unknown	632	10.3	0.0	0.0
Active	659	10.8	12.0	12.0
Transit	1,669	27.3	30.5	42.5
Active or transit	991	16.2	18.1	60.6
Auto	347	5.7	6.3	66.9
Auto or active	318	5.2	5.8	72.7
Auto or transit	938	15.4	17.1	89.8
Auto or active or transit	557	9.1	10.2	100
Total	**6,111**	**100**	**100**	

We then combine these predicted commute modes with the actual reported mode to identify the minimum and maximum likely proportions of the study population for each mode. Table 61 presents the percentage of respondents in each of the following predicted and actual commute mode choices (for example, 22.8% of respondents are both predicted and actual transit-only commuters). In this table, the unknown predicted and actual commutes are excluded.

Table 61: Predicted commute class by actual mode choice

	Final revised commuter class							
Predicted commute class	Transit-only %	Walk-only %	Bike-only %	Combined transit, walk, cycle %	Auto-only %	Auto and transit %	Auto and other %	Total %
Active	5.2	2.7	0.5	0.5	1.7	0.9	0.3	11.7
Transit	22.8	0.6	0.1	0.1	4.2	2.6	0.3	30.6
Active or transit	9.5	4.4	0.4	0.8	1.8	0.9	0.2	18.1
Auto	2.6	—	0.0	—	2.5	1.1	—	6.3
Auto or active	1.3	0.1	—	—	2.8	1.5	0.0	5.7
Auto or transit	8.1	0.0	0.1	0.1	6.0	3.0	0.0	17.3
Auto or active or transit	4.1	0.0	0.1	—	4.3	1.6	0.1	10.2
All	**53.5**	**7.9**	**1.2**	**1.4**	**23.4**	**11.6**	**0.9**	**100**

Note: dashes indicate unknown values.

We can then derive the minimum predicted share for each mode (i.e., those for whom a single mode is predicted) and the maximum predicted share for each mode (i.e., those who are predicted to use the mode alone or in combination with others) and compare that with the actual reported commute mode choice. The results in Table 62 indicate the following:

- The proportion of hotel workers in our study who used transit as a single mode was almost double the minimum we predicted (31% versus 54%), but the proportion who made auto-only commutes was also higher than our predicted minimum rate.

- Our maximum predicted transit share of 76% meant that it was unlikely that transit commuting could grow beyond three-quarters of downtown Vancouver hotel workers, regardless of subsidy level. With 67% of commutes involving transit, this suggested that the existing and experimental subsidies were effective in shifting transit commuting from an already high level close to the likely upper limit.
- There appears to be some room for growth in active commuting (with an approximately 35% difference between actual single and mixed mode active commuting at 12% and the maximum predicted levels for those modes at 46%). Conversely, essentially all workers predicted as commuting by active-only (12%) were already doing so, and hence we would not expect a higher subsidy to reduce active-only commuting. Note also that we did not count short walks to reach transit stops as active commutes in this analysis.
- The main scope for reduction in auto-only commuting lies in closing the gap between the actual (23%) and minimum predicted percentages of auto-only commuters (6%). Here levels of transit service, parking policies and promotion of ride-sharing may be more important than transit pricing in shifting behaviour.

Table 62: Range of actual and predicted mode share

Actual and predicted modes	Active %	Transit %	Auto %
Minimum predicted (single mode only)	11.7	30.6	6.3
Actual single mode	9.1	53.5	23.4
Actual single and mixed mode	11.5	66.5	35.9
Maximum predicted (single and mixed mode)	45.8	76.2	39.5

Parking survey

For each hotel, we surveyed the following nine blocks: the hotel block itself, as well as the eight blocks to the immediate north, northwest, east, northeast, south, southeast, west and southwest. This covered every block that touched the hotel block itself even if only by a corner.[202]

For each of these blocks, we collected the following data on parking availability and prices for both street and parkade parking.

Street parking:

- car share spaces,
- metered street spaces anytime,
- metered street spaces non-peak,
- free parking (no cost, no permit required),
- free parking evening and night (no cost, no permit required),
- price per hour for metered street spaces (daytime), and
- price per hour metered street spaces (evening).

Parking lots:

[202] In one instance, geographical constraints reduced the number of blocks with parking surrounding the hotel.

- number of lots,
- number of spaces in each lot,
- number of lots open overnight,
- number of car share spaces,
- price per hour daytime,
- price per evening (after 6 p.m.),
- price per day,
- early bird daily price,
- price per month anytime entry,
- price per month evening and night only, and
- price per month daily only.

We collected this data through site visits and by reviewing online parking data (all data collected in November 2018) available on the following websites:

- Parkopedia,[203]
- PayByPhone,[204]
- EasyPark,[205]
- Impark,[206]
- Diamond Parking,[207]
- Advanced Parking,[208]
- Go Park,[209] and
- WestPark.[210]

We then aggregated the data for all the lots and blocks for each hotel. For the availability indicators, we calculated the sum of the spaces. For the price indicators, we calculated the weighted average based on the number of spaces.

Please note that the start and end times for daily, early bird and evening rates often varied slightly between parking lots. A common start time for an early bird rate was 8:00 a.m. or 9:00 a.m. (users must park before those times to obtain the early bird rates). For daily rates, 8:00 a.m. to 6:00 p.m. was a common time range. For evening flat rates, a common start time was 6:00 p.m.

Also, a limitation of our approach is that choosing the weighted average of monthly parking price as the single indicator does not account for the flexibility that hotel workers have to choose from a variety of lots that may have lower day rates or early bird rates, or the fact that workers may not drive to work every day that they work, even if they work full-time.

[203] "Parkopedia," Parkopedia, n.d., https://en.parkopedia.ca.
[204] "Pay by Phone," Pay by Phone, n.d., https://www.paybyphone.com.
[205], "EasyPark," EasyPark, https://www.easypark.ca.
[206] "Vancouver Parking," Impark, https://www.impark.com/vancouver-parking.
[207] "Home," Diamond Parking Service, September 21, 2011, https://www.diamondparking.com.
[208] "Vancouver," Advanced Parking, n.d., https://www.advancedparking.com/vancouver.
[209] "GOPARK," GOPARK, n.d., https://www.go-parking.com.
[210] "Home," WestPark Parking Services Inc., 2015, https://westpark.com.

Aggregated Compass Card data from TransLink

Compass for Organizations (CFO) is a TransLink program that makes it possible for employees to pay for their monthly Compass Card products (passes) automatically through payroll deduction, as well as for willing employers or other organizations to subsidize the cost of those passes.

All seven participating hotels enrolled in TransLink's CFO program at the outset of the study, before Simon Fraser University decided which hotels would add experimental subsidies. Employees at every hotel had the opportunity to receive a standard briefing on the CFO program, including transit tools and smart travel planning, from TransLink staff before the launch of the first survey and again when the experimental subsidies were announced and introduced at selected hotels. Although all hotels agreed to participate in the CFO program by setting up the capacity for payroll deductions for Compass Cards, it was still up to each individual worker whether to sign up for the payroll deduction.

As part of the design and approval phase of the study, TransLink and Simon Fraser University entered into a data-licensing agreement that included a set of protocols to protect the privacy and identity of individual Compass Card holders.

Once the study was underway and a minimum number of workers at each hotel had signed up for the CFO program, TransLink staff were able to provide the Simon Fraser University research team with monthly aggregated data and descriptive statistical indicators for the study hotels and for a non-CFO comparison group. To maintain a data protection separation between the operational and analytical functions within TransLink, staff responsible for aggregating and analyzing the data did not know which hotel the data corresponded to. Instead, TransLink's privacy officer provided us with information to associate descriptive statistics with the appropriate hotel. Further, TransLink only provided this data when the number of Compass Cards at a hotel reached 35 or more in the relevant month.

For each hotel, for each month starting from January 2018, we received descriptive and aggregated statistics from TransLink for all fare journeys per card per day (including mean, standard deviation, standard error of the mean, median, minimum and maximum). These descriptive statistics differentiated journeys that ended, started, started and ended, and neither started nor ended within downtown. They also differentiated those journeys that took place at regular and off-peak times ("off-peak" is defined as after 6:30 p.m. on Mondays to Fridays and all day on weekends). Cards with zero daily journeys were included in the calculation of the daily average.

Additional data provided (per hotel per month) comprise the following:

- total aggregated fare journeys,
- average number of fare journeys per card per month (including mean, standard deviation, standard error of the mean, median, minimum, maximum),
- average distance per journey,
- total distance,
- distribution of distance,

- distribution of journey start time, and
- percentage of Compass Cards breaking even relative to stored value.

A fare journey consists of a set of linked trips on transit that occur within a 90-minute time period. In other words, a journey may consist of one or more transit trips on different routes and modes, with transfers between them. A journey starts when a customer first taps onto the transit system.

Distance calculations were filtered to exclude journeys of less than 0.5 km and more than 70 km that may have been inaccurately estimated.

A non-CFO comparison group allowed us to observe the transit usage of a group of typical commuters who were unaffected by the experimental subsidies at the centre of this study. The comparison group consisted of 10,000 randomly selected adult monthly pass Compass Cards that had at least 20 or more fare journeys in a month originating in downtown Vancouver. The TransLink definition of downtown Vancouver comprises Transport Analysis Zone Groups 6 and 7. Group 6 is the downtown area bounded by False Creek, Burrard Street, the Burrard Inlet waterfront and Main Street north of Terminal Avenue. Group 7 is the rest of the downtown peninsula west of Burrard Street.

With TransLink's permission, we have compiled the descriptive aggregated statistical indicators in Appendix G. To avoid inadvertent release of identifiable information, we have included only selected statistics in this report.

Appendix D: Questionnaires, waves 1, 2 and 3

SFU SIMON FRASER UNIVERSITY
URBAN STUDIES

Employer Transit Subsidy Study - Survey of Hotel Employees

Hotel Name: _____ Survey ID Number: _____ [to be completed by SFU]

Thank you for agreeing to complete a questionnaire so that we can understand the factors, including transit subsidies, that may influence the travel patterns of downtown Vancouver hotel workers such as you. Because our travel patterns influence other aspects of our lives, we are going to ask you about three main topics: (1) your travel patterns, (2) your work at this hotel and in other jobs, and (3) your life, household and living conditions.

We hope that you will answer every question. However, as stated in the Consent Form, if you don't want to answer any question, you may skip over the question. Please be assured that only the SFU research team will be able to identify you from the information you provide - not your employer, not the union, not anyone else. At the end of the study some of the information you provide, which cannot be used to identify you, will become part of a dataset that can be shared.

If you have any questions as you complete the questionnaire, the SFU team is available to help you. Our contact email is: **hotelsfu@sfu.ca**

Date survey completed: _____

YOUR TRAVEL PATTERNS

1. Do you have a valid driver's license (including an 'N' license) to drive in Canada?

	Circle one
Yes	1
No	0

2. Do you own, lease or have regular access to use the following to travel to or from work?

	Tick all that apply
Motor vehicle (insured; not including carshare)	
Carshare (Evo, Modo, Car2Go, Zipcar, etc.)	
Motorcycle/Scooter/Moped	
Bicycle or bikeshare	

3. Do you regularly carpool to or from work? With who?

	Tick all that apply
I carpool with **co-workers at this hotel**	
I carpool with **other people**	
I **do not** regularly carpool	

4. Do you currently receive a subsidy from your employer for transit?

	Circle one
Yes, my employer offers a transit subsidy and I have taken it up	1
My employer offers a transit subsidy but **I have not taken it up**	2
No, my employer **does not offer** a transit subsidy	3

5. Have you travelled by public transit in Metro Vancouver in the past month?

	Circle one
Yes – **go to 5a**	1
No – **go to 6**	0

a. If yes, how do you currently **pay** for your transit trips?

Payment method		Tick all that apply
Cash or Compass Ticket (no Compass Card)		
Compass Card	Stored value	
	1-zone adult monthly pass	
	2-zone adult monthly pass	
	3-zone adult monthly pass	
	Concession monthly pass	
	West Coast Express monthly pass	
	U-Pass BC	

The most important thing we need to know for this study is <u>how you travel to and from work</u>.

6. <u>Today</u> is…

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did you leave home <u>today</u> to travel to work?
Enter hr/min and circle. ……: …….. am / pm

b. What was your method(s) of travel to work today?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

c. What other purpose or purposes did you have on your journey to work today?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip to work today	

d. What time today did you arrive and were ready to start work at this hotel?
Enter hr/min and circle. ……..: ..... am / pm

e. Is this your regular shift **start time**?

	Circle one
Yes: I arrived at my regular shift start time	1
No: my regular shift start time **is earlier**	2
No: my regular shift start time **is later**	3
No: I **don't have a** regular shift **start time**	4

7. The <u>last day you worked at this hotel</u> before today was a….

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did you leave work the last day that you worked here?
Enter hr/min and circle. ……..: ..... am / pm

b. Is this your regular shift **end time**?

	Circle one
Yes: I left at my regular shift end time	1
No: my regular shift end time **is earlier**	2
No: my regular shift end time **is later**	3
No: I **don't have** a regular shift **end time**	4

c. What was your method(s) of travel to home that day?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

d. What other purpose or purposes did you have on your journey back home that day?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip back home	

e. What time did you arrive at home the last day that you worked here?
Enter hr/min and circle. ……: ……. am/pm

8. Thinking back over last seven (7) days, please tick the days you worked at this hotel:

	Tick if you worked at this hotel on this day in the **last 7 days**
Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

YOUR WORK – please tell us about your work at this hotel and in any other jobs:

9. In what year did you first start working at this hotel? _____

10. What is your current position / job title <u>at this hotel</u>? Please <u>tick all jobs</u> which currently apply to you in the list below. If you don't see yours listed, please choose other and write in the job title.

Example	✓	In-room dining	
Banquet server		Janitorial	
Bartender		Laundry	
Bar server		Management	
Bellperson/porter		Night cleaner	
Cook		Office/administration/sales	
Concierge		Parking/valet	
Dishwasher		Restaurant server	
Engineering/maintenance		Room attendant	
Front desk		Security	
Host		Steward	
Housekeeping		Telephone/PBX	
Other, please write in:		…….	

11. What is your current hourly wage at this hotel (tips not included)? $_____ per hour
    OR
    What is your current monthly salary at this hotel (before taxes)? $_____ per month

12. Do you regularly work in another job or jobs?

	Circle one
Yes – **go to 12a**	1
No – **go to 13**	0

a. Please provide information about the other job/jobs:

	Other job 1	Other job 2
Job title / Position		
Number of shifts worked last week		
Current hourly wage	$	$
Please write in the location of the other job. E.g. **Downtown Vancouver**, or the name of the **suburb, neighbourhood** or **city**		
Is the job easy to reach on transit? Please circle.	Yes - 1	Yes - 1
	No - 0	No - 0

13. Do you currently attend school, college, university or some other training institution?

	Circle one
Yes – **go to 13a**	1
No – **go to 14**	0

a. If yes, do you attend school, college, university or training in downtown Vancouver?

	Circle one
Yes	1
No	0

b. Is the school, college, university or training you attend easy to reach on transit?

	Circle one
Yes	1
No	0

YOUR LIFE – please tell us about yourself, and your household.

14. Please rate the following aspects of the quality of your life on a scale from positive to negative. Tick the box for each item which best describes your feeling:

	Very positive	Positive	Neutral	Negative	Very negative
Example…			✓		
Your general happiness with life					
The time that you spend with your family/friends					
Your physical health					
Your level of stress					
The predictability of your commute from home to work					
The predictability of your commute back home					
Your shift schedule(s)					
Your general happiness at work					

15. How old are you?

	Circle one
Under 25 years old	1
25-34 years	2
35-44 years	3
45-54 years	4
55-64 years	5
65 years or older	6

16. With which gender do you most identify? _____

17. Were you born in Canada?

	Circle one
Yes	1
No, I moved to Canada as a child (under 18)	2
No, I moved to Canada as an adult (18 or older)	3

18. With which ethnic background do you most identify? _____

19. Where do you live? Please name the suburb, neighbourhood or city: _____

    a. What is your postal code (e.g. V6B 5K3)? _____

20. How many people, in addition to yourself, live as part of your household? You are the person in the first line.

	Write in number
You	*1*
Children or teenagers aged 0-18 years	
Other working adults, aged 19+ (including those doing part-time work)	
Not working adults, aged 19+ (retired, full-time student, unemployed, etc.)	
Total number of people in the household	

21. Which of the following best describe your **total household income per year** (before taxes)? Please choose the category that best fits:

Per year	Circle one
Less than $25,000	1
$25,000 to less than $50,000	2
$50,000 to less than $75,000	3
$75,000 to less than $100,000	4
$100,000 to less than $150,000	5
$150,000 or more	6
Don't know	7

22. Does your household rent or own your home?

	Circle one
Rent	1
Own (includes having a mortgage)	2

23. How much does your household spend **per month on housing** where you live? This includes rent, regular mortgage payments (principal and interest), property taxes, condominium fees, as well as electricity, fuel, water, and other municipal services. Please choose the category that best fits:

Per month	Circle one
Less than $700	1
$700 to less than $1,400	2
$1,400 to less than $2,100	3
$2,100 to less than $2,800	4
$2,800 to less than $4,200	5
$4,200 or more	6
Don't know	7

Thank you for taking the time to complete this important survey.
If you have any questions please contact us by email at: **hotelsfu@sfu.ca**

SFU SIMON FRASER UNIVERSITY
URBAN STUDIES

Employer Transit Subsidy Study - Survey of Hotel Employees

Hotel: _____ Survey ID Number: _____ Date distributed: _____ [completed by SFU]

Thank you for agreeing to complete a questionnaire so that we can understand the factors, including transit subsidies, that may influence the travel patterns of downtown Vancouver hotel workers such as you. Because our travel patterns influence other aspects of our lives, we are going to ask you about three main topics: (1) your travel patterns, (2) your work at this hotel and in other jobs, and (3) your life, household and living conditions.

We hope that you will answer every question. However, as stated in the Consent Form, if you don't want to answer any question, you may skip over the question. Please be assured that only the SFU research team will be able to identify you from the information you provide - not your employer, not the union, not anyone else. At the end of the study some of the information you provide, which cannot be used to identify you, will become part of a dataset that can be shared.

If you have any questions as you complete the questionnaire, the SFU team is available to help you. Our contact email is: **hotelsfu@sfu.ca**

YOUR TRAVEL PATTERNS

1. Do you have a valid driver's license (including an 'N' license) to drive in Canada?

	Circle one
Yes	1
No	0

2. Do you own, lease or have regular access to use the following to travel to or from work?

	Tick all that apply
Motor vehicle (insured; not including carshare)	
Carshare (Evo, Modo, Car2Go, Zipcar, etc.)	
Motorcycle/Scooter/Moped	
Bicycle or bikeshare	
None of the above	

3. Do you regularly carpool to or from work? With who?

	Tick all that apply
I carpool with **co-workers at this hotel**	
I carpool with **other people**	
I **do not** regularly carpool	

4. Do you currently receive a subsidy from your employer for transit?

	Circle one
Yes, my employer offers a transit subsidy and I have taken it up	1
My employer offers a transit subsidy but **I have not taken it up**	2
No, my employer **does not offer** a transit subsidy	3

   a. If your employer offers a transit subsidy but you **have not taken it up**, why don't you? Please write in:

   _____

5. Have you travelled by public transit in Metro Vancouver in the past month?

	Circle one
Yes – **go to 5a**	1
No – **go to 6**	0

a. If yes, how do you currently **pay** for your transit trips?

Payment method		Tick all that apply
Cash or Compass Ticket (no Compass Card)		
Compass Card	Stored value	
	1-zone adult monthly pass	
	2-zone adult monthly pass	
	3-zone adult monthly pass	
	Concession monthly pass	
	West Coast Express monthly pass	
	U-Pass BC	

The following section of the survey asks you questions about how <u>you travel to and from work</u>. To help us understand your answers, we first we need to know what day of the week it is today.

6. <u>Today</u> is…

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did you leave home <u>today</u> to travel to work?
Enter the hour and minute. Circle am or pm. ……: …….. am / pm

b. What time <u>today</u> did you arrive and were ready to start work at this hotel?
Enter the hour and minute. Circle am. or pm. ……: ……. am / pm

c. Is this your regular shift **start time**?

	Circle one
Yes: I arrived at my regular shift start time	1
No: my regular shift start time **is earlier**	2
No: my regular shift start time **is later**	3
No: I **don't have a** regular shift **start time**	4

d. What was your method(s) of travel to work today?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

e. What other purpose or purposes did you have on your journey to work today?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip to work today	

7. Now we're going to switch to asking you about the **last day before today** that you worked at this hotel. What day of the week was that?

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did you **leave work** on the last day before today that you worked here?
Enter the hour and minute. Circle am or pm. ……..: ..... am / pm

b. Was the time that you left work that day your regular shift **end time**?

	Circle one
Yes: I left at my regular shift end time	1
No: my regular shift end time **is earlier**	2
No: my regular shift end time **is later**	3
No: I **don't have** a regular shift **end time**	4

c. What time did you **arrive home** the last day before today that you worked here?
Enter the hour and minute. Circle am or pm. ……..: ..... am / pm

d. What was your method(s) of travel to home that day (the last day before today you worked here)?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

If **by auto**, how much did you pay or contribute for **parking**? $_____ per day

OR

$_____ per month

e. What other purpose or purposes did you have on your journey back home that day (the last day before today you worked here)?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip back home	

8. Thinking back over the last seven (7) days <u>before</u> today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

	Tick if you worked at this hotel on this day in the **last 7 days**
Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

YOUR WORK – please tell us about your work at this hotel and in any other jobs:

9. In what year did you first start working <u>at this hotel</u>? _____

10. Is your job at this hotel easy to reach on transit?

	Circle one
Yes	1
No	0

11. What is your current position / job title at this hotel? Please tick all jobs which currently apply to you in the list below. If you don't see yours listed, please choose other and write in the job title.

Example	✓	In-room dining	
Banquet server		Janitorial	
Bartender		Laundry	
Bar server		Management	
Bellperson/porter		Night cleaner	
Cook		Office/administration/sales	
Concierge		Parking/valet	
Dishwasher		Restaurant server	
Engineering/maintenance		Room attendant	
Front desk		Security	
Host		Steward	
Housekeeping		Telephone/PBX	
Other, please write in:		…….	

12. What is your current hourly wage at this hotel (tips not included)? $_____ per hour

    OR

    What is your current monthly salary at this hotel (before taxes)? $_____ per month

13. Do you regularly work in another job or jobs?

	Circle one
Yes – **go to 13a**	1
No – **go to 14**	0

a. Please provide information about the other job/jobs:

	Other job 1	Other job 2
Job title / Position		
Number of shifts worked last week		
Current hourly wage	$	$
Please write in the location of the other job. E.g. **Downtown Vancouver**, or the name of the **suburb, neighbourhood** or **city**		
Is the job easy to reach on transit? Please circle.	Yes – 1	Yes – 1
	No – 0	No – 0

14. Do you currently attend school, college, university or some other training institution?

	Circle one
Yes – **go to 14a**	1
No – **go to 15**	0

a. If yes, do you attend school, college, university or training in downtown Vancouver?

	Circle one
Yes	1
No	0

b. Is the school, college, university or training you attend easy to reach on transit?

	Circle one
Yes	1
No	0

YOUR LIFE – please tell us about yourself, and your household.

15. Please rate the following aspects of the quality of your life on a scale from positive to negative. Tick the box for each item which best describes your feeling:

	Very positive	**Positive**	**Neutral**	**Negative**	**Very negative**
Example…			✓		
Your general happiness with life					
The time that you spend with your family/friends					
Your physical health					
Your level of stress					
The predictability of your commute from home to work					
The predictability of your commute back home					
Your shift schedule(s)					
Your general happiness at work					

16. How old are you?

	Circle one
Under 25 years old	1
25-34 years	2
35-44 years	3
45-54 years	4
55-64 years	5
65 years or older	6

17. What is the language that you first learned at home in childhood and still understand? _____

18. Do you identify as…?

	Circle one
Female	1
Male	2
Other	3
Prefer not to say	4

19. Were you born in Canada?

	Circle one
Yes	1
No, I moved to Canada as a child (under 18)	2
No, I moved to Canada as an adult (18 or older)	3

20. With which ethnic background do you most identify? _____

21. Where do you live? Please name the suburb, neighbourhood or city: _____

    a. What is your postal code (e.g. V6B 5K3)? _____

22. How many people, including yourself, live as part of your household?

	Write in number
Children or teenagers aged 0-18 years	
Working adults, **including you**, aged 19+ (including those doing part-time work)	
Not working adults, aged 19+ (retired, full-time student, unemployed, etc.)	
Total number of people in the household	

23. Which of the following best describe your **total household income per year** (before taxes)?
    Please choose the category that best fits:

Per year	Circle one
Less than $25,000	1
$25,000 to less than $50,000	2
$50,000 to less than $75,000	3
$75,000 to less than $100,000	4
$100,000 to less than $150,000	5
$150,000 or more	6
Don't know	7

24. Does your household rent or own your home?

	Circle one
Rent	1
Own (includes having a mortgage)	2

25. How much does your household spend **per month on housing** where you live? This includes rent, regular mortgage payments (principal and interest), property taxes, condominium fees, as well as electricity, fuel, water, and other municipal services. Please choose the category that best fits:

Per month	Circle one
Less than $700	1
$700 to less than $1,400	2
$1,400 to less than $2,100	3
$2,100 to less than $2,800	4
$2,800 to less than $4,200	5
$4,200 or more	6
Don't know	7

Date survey completed: _____

If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:

_____

_____

_____

_____

_____

_____

Thank you for taking the time to complete this important survey.
If you have any questions, please contact us by email at: **hotelsfu@sfu.ca**

SFU SIMON FRASER UNIVERSITY
URBAN STUDIES

Employer Transit Subsidy Study - Survey of Hotel Employees – March 2019

Hotel: _____ Survey ID Number: _____ Date distributed: _____ [completed by SFU]

Thank you for agreeing to complete a questionnaire so that we can understand the factors, including transit subsidies, that may influence the travel patterns of downtown Vancouver hotel workers such as you. Because our travel patterns influence other aspects of our lives, we are going to ask you about three main topics: (1) your travel patterns, (2) your work at this hotel and in other jobs, and (3) your life, household and living conditions.

We hope that you will answer every question. However, as stated in the Consent Form, if you don't want to answer any question, you may skip over the question. Please be assured that only the SFU research team will be able to identify you from the information you provide - not your employer, not the union, not anyone else. At the end of the study some of the information you provide, which cannot be used to identify you, will become part of a dataset that can be shared.

If you have any questions, the SFU team is available to help you. Our contact email is: **hotelsfu@sfu.ca**

YOUR TRAVEL PATTERNS

1. Do you have a valid driver's license (including an 'N' license) to drive in Canada?

	Circle one
Yes	1
No	0

2. Do you own, lease or have regular access to use the following to travel to or from work?

	Tick all that apply
Motor vehicle (insured; not including carshare)	
Carshare (Evo, Modo, Car2Go, Zipcar, etc.)	
Motorcycle/Scooter/Moped	
Bicycle or bikeshare	
None of the above	

3. Do you regularly carpool to or from work? With who?

	Tick all that apply
I carpool with **co-workers at this hotel**	
I carpool with **other people**	
I **do not** regularly carpool	

4. Do you currently receive a subsidy from your employer for transit?

	Circle one
Yes, my employer offers a transit subsidy and I have taken it up	1
My employer offers a transit subsidy but **I have not taken it up**	2
No, my employer **does not offer** a transit subsidy	3

   a. Why did you **take up OR not take up** the transit subsidy offered by your employer? Please write in:

_____

_____

5. Have you travelled by public transit in Metro Vancouver in the past month?

	Circle one
Yes – **go to 5a**	1
No – **go to 6**	0

a. If yes, how do you currently **pay** for your transit trips?

Payment method		Tick all that apply
Cash or Compass Ticket (no Compass Card)		
Compass Card	Stored value	
	AutoLoad	
	1-zone adult monthly pass	
	2-zone adult monthly pass	
	3-zone adult monthly pass	
	Concession monthly pass	
	West Coast Express monthly pass	
	U-Pass BC	

The following section of the survey asks you questions about how <u>you travel to and from work</u>. To help us understand your answers, we first we need to know what day of the week it is today.

6. <u>Today</u> is…

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did you leave home <u>today</u> to travel to work?
Enter the hour and minute. Circle am or pm. ……: …….. am / pm

b. What time <u>today</u> did you arrive and were ready to start work at this hotel?
Enter the hour and minute. Circle am. or pm. ……: ……. am / pm

c. What time did your **shift start** today?
Enter the hour and minute. Circle am. or pm. ……:……. am / pm

d. Is this your regular shift **start time**?

	Circle one
Yes: this is my regular shift start time	1
No: my regular shift start time **is earlier**	2
No: my regular shift start time **is later**	3
No: I **don't have a** regular shift **start time**	4

e. What was your method(s) of travel to work today?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

f. What other purpose or purposes did you have on your journey to work today?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip to work today	

7. Now we're going to switch to asking you about the **last day before today** that you worked at this hotel. What day of the week was that?

	Circle one
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

a. What time did your **shift end** on the last day before today that you worked here?
Enter the hour and the minute. Circle am or pm. ……: …….. am / pm

b. Is this your regular shift **end time**?

	Circle one
Yes: this is my regular shift end time	1
No: my regular shift end time **is earlier**	2
No: my regular shift end time **is later**	3
No: I **don't have** a regular shift **end time**	4

c. What time did you **leave work** on the last day before today that you worked here?
Enter the hour and minute. Circle am or pm. ……: …….. am / pm

d. What time did you **arrive home** the last day before today that you worked here?
Enter the hour and minute. Circle am or pm. ……: …….. am / pm

e. What was your method(s) of travel to home that day (the last day before today you worked here)?

	Tick all that apply
Auto (driver)	
Auto (passenger)	
Transit bus	
SkyTrain	
West Coast Express	
SeaBus	
Walked **whole** way	
Walked **part** way	
Bicycle	
Taxi	
Motorcycle	

If **by auto**, including as a driver, passenger or in a car-pool how much did you pay or contribute for **parking**?

$_____ per day

OR

$_____ per month

f. What other purpose or purposes did you have on your journey back home that day (the last day before today you worked here)?

	Tick all that apply
Drop off or pick up kids, partner, or someone else	
For you to go **shopping or run errands**	
For you to **eat, drink**, or **get take-out**	
For you to go **to work** (2nd job)	
For you to go **to school or study**	
Some **other reason** for stopping	
Did **not stop** for any reason on the trip back home	

8. Thinking back over the last seven (7) days <u>before</u> today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

	Tick if you worked at this hotel on this day in the **last 7 days**
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

YOUR WORK – please tell us about your work at this hotel and in any other jobs:

9. In what year did you first start working <u>at this hotel</u>? _____

10. Is your job at this hotel easy to reach on transit?

	Circle one
Yes	1
No	0

11. What is your current position / job title <u>at this hotel</u>? Please <u>tick all jobs</u> which currently apply to you in the list below. If you don't see yours listed, please choose other and write in the job title.

Example	✓	In-room dining	
Banquet server		Janitorial	
Bartender		Laundry	
Bar server		Management	
Bellperson/porter		Night cleaner	
Cook		Office/administration/sales	
Concierge		Parking/valet	
Dishwasher		Restaurant server	
Engineering/maintenance		Room attendant	
Front desk		Security	
Host		Steward	
Housekeeping		Telephone/PBX	
Other, please write in:		…….	

12. What is your current hourly wage at this hotel (tips not included)? $_____ per hour

    OR

    What is your current monthly salary at this hotel (before taxes)? $_____ per month

13. Do you regularly work in **another job or jobs**?

	Circle one
Yes – **go to 13a**	1
No – **go to 14**	0

    a. Please provide information about the **other job/jobs**:

	Other/Second job	Other/Third job
Job title / Position		
Number of shifts worked last week		
Current hourly wage	$	$
Please write in the location of the other job. E.g. **Downtown Vancouver**, or the name of the **suburb, neighbourhood** or **city**		
Is the job easy to reach on transit? Please circle.	Yes – 1	Yes – 1
	No – 0	No – 0

14. Do you currently attend school, college, university or some other training institution?

	Circle one
Yes – **go to 14a**	1
No – **go to 15**	0

a. If yes, do you attend school, college, university or training in downtown Vancouver?

	Circle one
Yes	1
No	0

b. Is the school, college, university or training you attend easy to reach on transit?

	Circle one
Yes	1
No	0

YOUR LIFE – please tell us about yourself, and your household.

15. Please rate the following aspects of the quality of your life on a scale from positive to negative. Tick the box for each item which best describes your feeling:

	Very positive	**Positive**	**Neutral**	**Negative**	**Very negative**
Example…			✓		
Your general happiness with life					
The time that you spend with your family/friends					
Your physical health					
Your level of stress					
The predictability of your commute from home to work					
The predictability of your commute back home					
Your shift schedule(s)					
Your general happiness at work					

16. How old are you?

	Circle one
Under 25 years old	1
25-34 years	2
35-44 years	3
45-54 years	4
55-64 years	5
65 years or older	6

17. What is the language that you first learned at home in childhood and still understand? _____

18. Do you identify as…?

	Circle one
Female	1
Male	2
Other	3
Prefer not to say	4

19. Were you born in Canada?

	Circle one
Yes	1
No, I moved to Canada as a child (under 18)	2
No, I moved to Canada as an adult (18 or older)	3

20. With which ethnic background do you most identify? _____

21. Where do you live? Please name the suburb, neighbourhood or city: _____

    a. What is your postal code (e.g. V6B 5K3)? _____

22. How many people, including yourself, live as part of your household?

	Write in number
Children or teenagers aged 0-18 years	
Working adults, **including you**, aged 19+ (including those doing part-time work)	enter at least 1
Not working adults, aged 19+ (retired, full-time student, unemployed, etc.)	
Total number of people in the household, including you	enter at least 1

23. Which of the following best describe your **total household income per year** (before taxes)?
    Please choose the category that best fits:

Per year	Circle one
Less than $25,000	1
$25,000 to less than $50,000	2
$50,000 to less than $75,000	3
$75,000 to less than $100,000	4
$100,000 to less than $150,000	5
$150,000 or more	6
Don’t know	7

24. Does your household rent or own your home?

	Circle one
Rent	1
Own (includes having a mortgage)	2

25. How much does your household spend **per month on housing** where you live? This includes rent, regular mortgage payments (principal and interest), property taxes, condominium fees, as well as electricity, fuel, water, and other municipal services. Please choose the category that best fits:

Per month	Circle one
Less than $700	1
$700 to less than $1,400	2
$1,400 to less than $2,100	3
$2,100 to less than $2,800	4
$2,800 to less than $4,200	5
$4,200 or more	6
Don't know	7

Date survey completed: _____

If you have any comments about your travel to work or this survey that you'd like to make, please use the space below:

_____

_____

_____

_____

_____

_____

Thank you for taking the time to complete this important survey.
If you have any questions, please contact us by email at: **hotelsfu@sfu.ca**

Appendix E: Quasi-panel analysis

We were able to match some respondents across the three survey waves, creating a quasi-panel that we could then analyze to see how the same individual workers changed their transit-related behaviour in response to changes in the transit subsidy. Using the quasi-panel as a study subgroup allowed us to isolate respondents' transit behaviour while keeping other factors, especially unobservable personal preferences and circumstances, constant. However, since this study was not specifically designed as a panel study, we do not regard the quasi-panel as strictly representative of the study population and we do not use weights in this part of the analysis (this is also why we chose to call this a quasi-panel, since it is neither a true panel nor is it a pseudo-panel, as described in the relevant scholarly literature[211]). The quasi-panel over-represents long-term employees, and it is reasonable to assume that these people are more likely to have more established workplace and commuting routines.

This appendix has six sections. First, we describe and quantify our quasi-panel. We then discuss commute-mode shifts between waves 1 and 3 in the quasi-panel data, and thirdly, in the quasi-panel aggregated data for the paired hotels. Fourthly, we then explain what characteristics we were able to identify in workers who were mostly likely to accept the subsidy and, fifth, change commute modes, again for the quasi-panel. Finally, we provide quality-of-life indicators and consider how these changed over the study period for our quasi-panel.

About the quasi-panel

Table 63 enumerates the number of successfully matched, completed surveys for each hotel. Within the 2,581 valid responses received across all waves, we identified 1,469 unique individuals. Just over half (52%, or 769 individuals) of these responded in two or more waves of the survey, and just under a quarter (23%, or 343 individuals) responded to all three surveys.

In our analysis, we focused on the 444 individuals who responded in both Wave 1 and Wave 3, since this provided a before-after subsidy treatment, same-month, quasi-panel comparison. At Hotel G, we matched 28 respondents between Wave 1 and Wave 3. This was enough for statistical analysis. We matched more than 30 respondents at all other hotels and 102 at Hotel D. The findings we present here were used to confirm and enrich the findings presented in the main body of the report.

[211] B. Baltagi, "Panel Data Analysis," in *The SAGE Encyclopedia of Social Science Research Methods*, ed. M. S. Lewis-Beck, A. Bryman and T. F. Liao, Vol. 1, pp. 783–785 (Thousand Oaks, CA: SAGE Publications, 2004) doi: 10.4135/9781412950589.n684.

Table 63: Completed and matched surveys by hotel

Completed and matched surveys	A	B	C	D	E	F	G	Total
Wave 1	195	135	97	187	52	59	49	774
Wave 2	170	240	139	174	57	63	59	902
Wave 3	171	253	147	170	49	56	59	905
Total collected	536	628	383	531	158	178	167	2,581
Matched waves 1 and 2 (not 3)	29	14	13	28	8	10	10	112
Matched waves 1 and 3 (not 2)	25	20	13	30	4	6	4	102
Matched waves 2 and 3 (not 1)	23	84	43	32	6	11	13	212
Matched waves 1, 2 and 3	70	71	50	72	28	28	24	343
Total with some match	147	189	119	162	46	55	51	769
Total unique individuals	319	368	214	297	84	95	92	1,469
% with some match	46	51	56	55	55	58	55	52
% with all waves matched	22	19	23	24	33	29	26	23

Table 64 compares the responses from all respondents in waves 1 and 3, respectively, with the responses provided by the quasi-panel in Wave 3. For example, the quasi-panel was similar to wave 1 and 3 respondents with regard to driver's licences and living in the City of Vancouver, but quite different regarding years on the job, time of day they commute, housing tenure and shift regularity. In general, the matched respondents tended to be over-representative of long-term, more established employees.

Table 64: Comparing group characteristics—those matched from waves 1 to 3 versus total waves 1 to 3 respondents

Characteristics	Wave 1	Wave 3	Waves 1 and 3 matched
Has a valid driver's licence	77.8%	77.8%	78.1%
Has access to an auto	53.5%	52.3%	54.3%
Has travelled by public transit in Metro Vancouver in the past month	89.3%	85.5%	83.9%
Leaves home and returns between 6 a.m. and 9 p.m.	57.65	64.0%	69.5%
Leaves work/home between 6:30 p.m. and 1 a.m.	26.4%	29.4%	24.1%
Has regular shift start and end time	75.4%	71.7%	78.8%
Job class: housekeeping	27.9%	26.0%	30.6%
Job class: food & beverage	21.8%	24.8%	17.1%
Visible minority, recoded	70.1%	77.2%	77.3%
Renter	44.5%	45.0%	40.2%
Female	52.4%	47.8%	53.4%
Lives in downtown Vancouver (V6B, C, E, G or Z)	11.4%	11.8%	8.2%
Lives in City of Vancouver	48.5%	48.2%	48.2%
Household: spends more than one-third of income on housing	31.4%	30.8%	28.3%
Years in current job (average)	12.96 years	12.91 years	15.23 years
Driving distance from FSA to Burrard Station (average)	14.60 km	14.05 km	14.83 km

In the rest of this appendix, the data in the tables is from the quasi-panel respondents we matched from waves 1 to 3 of the survey.

Commute mode shifts for the quasi-panel of matched respondents, waves 1 to 3

Table 65 compares the commuter class for the quasi-panel of matched wave 1 and 3 respondents. This match shows several things. First, fully 79% (= 49.9 + 3.9 + 0.7 + 20.8 + 3.4 + 0.2, which is the sum on the diagonal in Table 65) of respondents had no change in commuting behaviour between waves 1 and 3. This shows that commuting is patterned behaviour, resistant to change.

Second, there was an increase in transit-only commuting from 56% to 57%. Further, this change did not come at the expense of active transport commuting modes: walk-only and bike-only commuting increased slightly, as did the combined active mode. The total transit and active mode share increased from 64% to 66%. This 2-percentage-point shift came from auto-only (down from 25% to 24%) and combined commutes involving auto and transit (down from 11% to 9%).

Table 65: Quasi-panel commute class for waves 1 and 3

Final revised commute class, Wave 3	Final revised commute class, Wave 1							
	Transit-only %	Walk-only %	Bike-only %	Combined transit, walk, cycle %	Auto-only %	Auto and transit %	Auto and other %	Total %
Transit-only %	49.9	0.5	—	0.5	1.4	5.3	—	57.4
Walk-only %	0.7	3.9	—	0.7	0.2	—	0.5	5.9
Bike-only %	—	—	0.7	—	0.2	0.2	—	1.1
Combined transit, walk, cycle %	0.9	0.7	—	—	—	—	—	1.6
Auto-only %	0.7	—	0.2	—	20.8	1.8	—	23.6
Auto and transit %	4.1	—	—	—	1.8	3.4	—	9.4
Auto and other %	—	0.7	—	—	—	—	0.2	0.9
Total %	**56.3**	**5.7**	**0.9**	**1.1**	**24.5**	**10.8**	**0.7**	**100**

Commute-mode shift for quasi-panel, aggregated by paired hotels, waves 1 to 3

The link between transit-involving commuting and the subsidy change is confirmed when we examine the mode-specific changes in the quasi-panel for our hotel pairs. In Table 66, we show that transit-only commuting increased by more, and transit use decreased by less, at the hotels with an experimental subsidy increase (A, D and F) than at their no-change paired comparison hotels (B, C and G).

Note, however, that the decrease in transit-only commuting at Hotel E still represents an anomaly, and that the overall proportion of transit use in the past month declined for the matched group, as it did for the overall study population. There are also small differences in total percentages reported in tables 65 and 66 due to missing data in the classification of the mutually exclusive commute classes shown in Table 66.

Table 66 shows that the larger the experimental subsidy, the larger the relative shift toward transit-only commuting. Compare, for example, the 4% (Hotel A) versus 2% (Hotel B) for a relative change from 15% to 25% subsidy, with 3% (Hotel D) versus −2% (Hotel C) for a relative change from 15% to 50% subsidy, and 3% (Hotel F) versus −7% (Hotel G) for a relative change from 0% to 50% subsidy.

Table 66: Quasi-panel: transit- and auto-only commuting and transit use in the past month, by hotel

		Transit use in past month			Transit-only commuting			Auto-only commuting		
Hotel	**Subsidy treatment**	**Wave 1 %**	**Wave 3 %**	**% change in share**	**Wave 1 %**	**Wave 3 %**	**% change in share**	**Wave 1 %**	**Wave 3 %**	**% change in share**
A	**15% to 25%, then constant**	96.7	94.5	−2.2	65.3	69.5	4.2	8.4	7.4	−1.1
B	**15%, no change**	95.5	94.4	−1.1	62.6	64.8	2.2	12.1	11.0	−1.1
C	**15%, no change**	93.5	80.6	−12.9	66.7	65.1	−1.6	14.3	15.9	1.6
D	**15% to 25%, then 50%**	79.8	73.7	−6.1	36.6	39.6	3.0	50.5	46.5	−4.0
E	**New 15%**	80.6	67.7	−12.9	59.4	56.3	−3.1	25.0	31.3	6.3
F	**New 25%, then to 50%**	73.5	79.4	5.9	35.3	38.2	2.9	35.3	32.4	−2.9
G	**0%, no change**	92.9	78.6	−14.3	64.3	57.1	−7.1	32.1	28.6	−3.6
All		88.9	83.6	−5.3	55.6	57.0	1.4	24.3	23.2	−1.1

There are also differences in the source of these mode shifts toward transit-only commuting. We've presented in Table 66 only the changes in auto-only commuting, since the results for other mode changes by hotel may be misleading because the absolute number of changers per hotel is small when it comes to active-only or auto-and-transit combined commuting. In the case of hotels A and B, which are both close to transit and in relatively expensive parking areas, only a portion of the increase in transit-only commuting came from a reduction in auto-only commuting. Furthermore, because there was no difference between these hotels in the decline in auto-only commute share, we cannot relate the decline in auto-only commuting to the experimental subsidy. Instead, Hotel A had a larger decline (−4%) than Hotel B (−1%) in the share of auto-and-transit-combined commuting (not shown in Table 66). In summary, the smaller experimental subsidy increase here changed commuting behaviour, but cannot be directly related to the reduction in the already relatively small share of auto-only commuting.

In contrast, the 5% increase in transit-only commuting at Hotel D relative to Hotel C (3% versus −2%) is more than accounted for by the 6% decrease in auto-only commuting (−4% versus 2%). The larger experimental subsidy increase here, in a context of poorer access to transit and cheaper parking, achieved a larger reduction in the auto-only commuting. The relative change of 3% of matched respondents from auto-only to transit-only commuting at Hotel F lends further support to this finding.

Together these findings suggest that larger transit-favouring effects can be achieved in contexts where auto-only commuting is a higher share of commuting.

Characteristics of those most likely to accept the subsidy

The quasi-panel of matched wave 1 and 3 respondents also allows us to examine the characteristics of workers who were most likely to accept the subsidy or change commuting behaviours in response to the transit subsidies. We'll deal with the subsidy accepters first.

One of the characteristics of subsidy accepters was a higher likelihood of working weekends. This may reflect the current pricing advantage of weekends, which is when SeaBus and SkyTrain trips across the entire Metro Vancouver region (three zones) are priced at the one-zone fare. It's possible that the weekend discount combined with the discount from the experimental subsidy were sufficient to trigger subsidy acceptance.

Table 67: Quasi-panel: weekend work and subsidy acceptance

		Change in subsidy acceptance status			
		Subsidy dropped %	**Subsidy no change %**	**Subsidy accepted %**	**Total %**
Works weekends	No	6.4	81.2	12.4	100
	Yes	5.1	73.6	21.3	100
All		**5.8**	**77.4**	**16.8**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	6.260[a]	2	0.044		
Likelihood ratio	6.319	2	0.042		
Linear-by-linear association	5.315	1	0.021		
N of valid cases	434				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 12.44.

A second group of subsidy accepters among our matched quasi-panel respondents was households with children at home. Given what we know about the complex commuting behaviour of those with childcare duties, this finding points to an equity-based case for transit subsidies as supporting those with family obligations.

Table 68: Quasi-panel: children in household and subsidy acceptance

		Change in subsidy acceptance status			Total %
		Subsidy dropped %	Subsidy no change %	Subsidy accepted %	
Children in household	No	6.8	80.3	12.9	100
	Yes	4.2	69.7	26.1	100
All		**6.1**	**77.5**	**16.4**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	11.328[a]	2	0.003		
Likelihood ratio	10.610	2	0.005		
Linear-by-linear association	9.981	1	0.002		
N of valid cases	444				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.24.					

Similarly, renters were more likely to accept the subsidy, though as we'll see in the next section, they were not more likely to switch to transit-only commuting.

Table 69: Quasi-panel: renters and subsidy acceptance

		Change in subsidy acceptance status			Total %
		Subsidy dropped %	Subsidy no change %	Subsidy accepted %	
Renter	No	6.3	81.0	12.6	100
	Yes	5.7	72.0	22.3	100
All		**6.1**	**77.5**	**16.4**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	7.183[a]	2	0.028		
Likelihood ratio	7.033	2	0.030		
Linear-by-linear association	5.183	1	0.023		
N of valid cases	444				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.64.					

New employees were more likely to accept the subsidy. This reinforces our argument for extending the subsidy as a benefit as soon as possible after hiring. Recall that we are dealing with the matched wave 1 to 3 respondents, hence they would have been on the job at least a year by the third wave, and the quasi-panel does not include employees hired after the first survey wave.

Table 70: Quasi-panel: new employees and subsidy acceptance

		Change in subsidy acceptance status			
		Subsidy dropped %	**Subsidy no change %**	**Subsidy accepted %**	**Total %**
Started after 2016	No	6.4	78.9	14.7	100
	Yes	3.6	67.3	29.1	100
All		**6.1**	**77.5**	**16.4**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	7.570[a]	2	0.023		
Likelihood ratio	6.717	2	0.035		
Linear-by-linear association	6.653	1	0.010		
N of valid cases	444				
a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.34.					

Characteristics of those who made changes to their commute modes

Given that a relatively small number of people within our quasi-panel of respondents matched from waves 1 to 3 changed their commuting behaviour, it is important from a policy perspective to understand the characteristics of this group. Here we report only those results where we found a statistically significant difference in transit behaviour in a demographic group. We also note that while accepting the subsidy could be a step in the process of switching from a non-transit commute mode to a form of commuting that involves transit, this is not necessarily the case. Renters, for example (see Table 69), were likely to accept the subsidy, but not likely to switch to transit-only commuting (see Table 74).

Table 71 shows that those who commuted during off-peak hours (as indicated by reporting that they left home or work between 6:30 p.m. and 1:00 a.m.) became more likely to have some transit in their commute from waves 1 to 3 of the survey. This probably reflects the attractiveness of the current transit pricing structure.

Table 71: Quasi-panel: change in transit commuting and off-peak travel (leaving home or work between 6:30 p.m. and 1:00 a.m.)

		Change in transit use in commute			Total %
		Stopped using transit in commute %	No change in use of transit in commute %	Addition of transit to commute %	
Left work/home between 6:30 p.m. and 1 a.m.	No	5.4	91.3	3.3	100
	Yes	1.9	88.7	9.4	100
All		**4.5**	**90.7**	**4.8**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	8.590[a]	2	0.014		
Likelihood ratio	8.141	2	0.017		
Linear-by-linear association	8.012	1	0.005		
N of valid cases	440				
a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.82.					

Those with a Compass Card product in Wave 3 were more likely to have no change in their use of transit as part of the commute (see Table 72). Conversely, those without a Compass Card product in Wave 3 of the survey were more likely to either stop using transit, or add it to their commute. The relative stability in commute choices of Compass Card product holders suggests some stable relationship—those who have monthly passes are less likely to change commute behaviour, and/or those who are do not change commute behaviour are more likely to have monthly passes.

Table 72: Quasi-panel: change in transit commuting and Compass Card products

		Change in transit use in commute			Total %
		Stopped using transit in commute %	No change in use of transit in commute %	Addition of transit to commute %	
Has a monthly Compass Card product	No	6.3	85.0	8.7	100
	Yes	3.4	94.7	1.9	100
All		**4.4**	**91.5**	**4.1**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	11.954[a]	2	0.003		
Likelihood ratio	11.096	2	0.004		
Linear-by-linear association	1.521	1	0.217		
N of valid cases	389				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.22.					

Those with non-working adults in their household were more likely to change their auto-and-transit commuting, either to add to it or stop doing it (see Table 73). Further analysis, not reported on here, indicates that those who had non-working adults in their household

were more likely to change from auto-and-transit commuting to transit-only commuting than those who did not have non-working adults in their household. This is consistent with the notion that even though non-working adults can increase the range of a household's commuting options by providing rides or doing pick-ups, the addition or enhancement of a transit subsidy might actually liberate household members from pick-up or drop-off duties, regardless of whether the driver is the subsidy recipient or the non-working household member.

Table 73: Quasi-panel: change in transit-and-auto combined commuting, and presence of non-working adults in household

		Change in auto and transit combined commuting			Total %
		Stopped using auto and transit combined in commute %	No change in use of auto and transit combined in commute %	Addition of auto and transit combined to commute %	
Non-working adults in household	No	5.2	89.6	5.2	100
	Yes	15.3	75.5	9.2	100
All		**7.4**	**86.5**	**6.1**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	14.232[a]	2	0.001		
Likelihood ratio	12.440	2	0.002		
Linear-by-linear association	2.116	1	0.146		
N of valid cases	444				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.96.					

Renters, however, were not more likely to shift to transit-only commuting, despite their likelihood to accept the subsidy (see Table 74). This is perhaps because renters already had high rates of transit-only commuting. High acceptance of the subsidy among renters combined with less transit-only commuting suggests that while a subsidy will not achieve further mode shift among a group that already has high transit commuting rates, renters appreciated the subsidy and may have used it to offset their high housing costs or other fixed household costs.

Table 74: Quasi-panel: change in transit-only commuting and housing tenure

		Change in transit-only commuting			Total %
		Change away from transit-only commute %	No change in use of transit in commute %	Change to transit-only commute %	
Renter	No	7.1	82.5	10.4	100
	Yes	5.7	90.3	4.0	100
All		**6.5**	**85.6**	**7.9**	**100**
Chi-square Tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	6.565[a]	2	0.038		
Likelihood ratio	7.110	2	0.029		
Linear-by-linear association	1.881	1	0.170		
N of valid cases	444				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.43.					

We also looked at the characteristics of those who stopped using transit from waves 1 to 3, finding few noteworthy relationships.

We found that those who had access to autos were more likely to stop using transit, and less likely to accept the subsidy (see Table 75). This makes sense in that having an auto makes it easier to switch between auto and non-auto modes.

Table 75: Quasi-panel: change in transit use in the past month and access to automobile

		Change in transit use in the past month			Total %
		Stopped using transit in past month %	No change in use of transit in past month %	Addition of transit use in past month %	
Do you have access to an auto?	No	5.1	92.8	2.1	100
	Yes	13.3	80.7	6.0	100
All		**9.6**	**86.2**	**4.2**	**100**
Chi-square tests					
	Value	**Df**	**Asymptotic significance (2-sided)**		
Pearson chi-square	13.174[a]	2	0.001		
Likelihood ratio	13.922	2	0.001		
Linear-by-linear association	1.397	1	0.237		
N of valid cases	428				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.20.					

Quality of life

We asked respondents in each wave of the survey to rate various aspects of their quality of life.

Those who accepted or dropped the subsidy (i.e., made a subsidy change) were less likely to report more time spent with family and friends (see Table 76). This suggests that changes in commute behaviour do seem to decrease the perceived amount of time spent with family and friends. This is probably a temporary adjustment but one that planners might be aware of in messaging.

Table 76: Quasi-panel: change in assessment of time spent with family and friends among subsidy switchers

		Change in time spent with family and friends		
		Improved %	**Static or declined %**	**Total %**
Change: subsidy acceptance	Subsidy dropped	10.0	90.0	100
	Subsidy no change	21.9	78.1	100
	Subsidy accepted	9.7	90.3	100
All		**19.4**	**80.6**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	6.156[a]	2	0.046	
Likelihood ratio	6.965	2	0.031	
Linear-by-linear association	1.413	1	0.234	
N of valid cases	392			
a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.88.				

Overall, 25% of the quasi-panel of respondents matched from waves 1 to 3 reported a decline in happiness at work, but among those who switched away from commutes that included transit, this rate was much higher: 50% (see Table 77). Meanwhile, only 19% of those who added transit to their commutes reported a decline in their happiness at work. These differential rates of decline in reported happiness at work indicated that those whose commutes included transit were more likely to have stable or improved feelings of happiness at work than those who commuted by other modes.

Table 77: Quasi-panel: change in happiness at work and change in transit use in commute

		Change in reported workplace happiness		Total %
		Improved or static %	Declined %	
Change: transit use in commute	Stopped using transit in commute	50.0	50.0	100
	No change in use of transit in commute	75.7	24.3	100
	Addition of transit to commute	81.3	18.8	100
All		**74.8**	**25.2**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	6.404[a]	2	0.041	
Likelihood ratio	5.636	2	0.060	
Linear-by-linear association	4.705	1	0.030	
N of valid cases	401			
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.03.				

Almost half of quasi-panel respondents who added transit to their commutes reported decreases in their stress levels from waves 1 to 3 of the survey (see Table 78).

Table 78: Quasi-panel: change in reported stress level and change in transit use in commutes

		Change in reported level of stress		Total %
		Decreased stress level %	Static or increased stress level %	
Change: transit use in commute	Stopped using transit in commute	6.3	93.8	100
	No change in use of transit in commute	29.6	70.4	100
	Addition of transit to commute	46.7	53.3	100
All		**29.3**	**70.7**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	6.305[a]	2	0.043	
Likelihood ratio	7.393	2	0.025	
Linear-by-linear association	6.156	1	0.013	
N of valid cases	376			
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 4.39.				

Everyone in the quasi-panel of matched respondents (waves 1 to 3) who added transit to their commutes reported either constant or decreased stress levels (see Table 79). Meanwhile, only 69% of those in the quasi-panel who shifted away from transit in their

commutes reported decreased stress levels. Almost one-third (31%) of those who shifted away from transit in their commutes reported increased stress levels.

Table 79: Quasi-panel: change in reported stress level and change in use of transit in commute

		Change in reported level of stress		Total %
		Decreased or static stress level %	Increased stress level %	
Change: transit use in commute	Stopped using transit in commute	68.8	31.3	100
	No change in use of transit in commute	79.1	20.9	100
	Addition of transit to commute	100	0.0	100
All		**79.5**	**20.5**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	5.035[a]	2	0.081	
Likelihood ratio	7.931	2	0.019	
Linear-by-linear association	4.543	1	0.033	
N of valid cases	376			
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 3.07.				

Further supporting the association between reported level of stress and the use of transit in commuting, those who switched to transit-only commuting were more likely to express decreased or constant stress—over 90%, compared to only 68% of those who stopped being transit-only commuters (see Table 80).

Table 80: Quasi-panel: change in reported stress level and change in transit-only commuting

		Change in reported level of stress		
		Decreased or static stress level %	**Increased stress level %**	**Total %**
Change: transit- only commute	Change away from transit-only commute	68.0	32.0	100
	No change in use of transit in commute	79.3	20.7	100
	Change to transit-only commute	92.9	7.1	100
All		**79.5**	**20.5**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	5.109[a]	2	0.078	
Likelihood ratio	5.683	2	0.058	
Linear-by-linear association	5.058	1	0.025	
N of valid cases	376			
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.12.				

Of those who gave up auto-only commuting from waves 1 to 3, 54% reported improved stress levels (see Table 81). This contrasted with the 100% of those who switched to auto-only commuting who reported static or increased stress levels. Note, however, that this apparently overwhelming finding may not be statistically significant due to the small sample size.

Table 81: Quasi-panel: change in reported stress level and change in auto-only commuting

		Change in reported level of stress		
		Decreased stress level %	**Static or increased stress level %**	**Total %**
Change: auto-only commute	Change away from auto-only commute	53.8	46.2	100
	No change in use of auto in commute	29.0	71.0	100
	Change to auto- only commute	0	100	100
All		**29.3**	**70.7**	**100**
Chi-square tests				
	Value	**Df**	**Asymptotic significance (2-sided)**	
Pearson chi-square	7.117[a]	2	0.028	
Likelihood ratio	8.963	2	0.011	
Linear-by-linear association	7.058	1	0.008	
N of valid cases	376			
a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.34.				

Appendix F: Multivariate analysis

Multivariate analysis allows us to examine how a single explanatory or independent variable (such as gender or subsidy level) might change an outcome or a dependent variable (such as taking transit), while controlling for, or holding equal, all the other variables (such as age or income) we were able to identify and observe.

We identified the following eight different types of transit behaviours, each expressed in binary (yes-no) form:

1. Transit user (used transit in the past month)
2. Has a monthly Compass Pass product
3. Subsidy acceptance
4. Any commuting by transit
5. Commute by transit only
6. Commute by active transport only
7. Commute by auto only
8. Commute by auto and transit

In the transit models that follow below in table form, we modelled each of these transit behaviours as the dependent variable in tables that we numbered starting with 1a or 1b. The letters (a and b) signify which of two datasets we used for each table.

We have also modelled the following eight quality-of-life indicators, each rated on a scale consisting of very positive, positive, neutral, negative, and very negative:

1. Your general happiness with life
2. The time that you spend with your family and friends
3. Your physical health
4. Your level of stress
5. The predictability of your commute from home to work
6. The predictability of your commute from work to home
7. Your satisfaction with your shift schedules
8. Your general happiness at work

In the quality-of-life models that follow below in table form, positive or very positive responses are modelled as the dependent variables in tables captioned with binary logistics regression codes starting with 2a or 2b. The letters (a and b) indicate which of two datasets we used for each table.

Thus, tables with captions that include (in parentheses) codes starting with 1 refer to regressions with transit outcomes, and those numbered starting with 2 refer to regressions with quality-of-life outcomes. Tables captioned with an “a” refer to regressions using the first dataset, which is the total pooled responses for waves 1, 2 and 3. Tables captioned with a “b” refer to regressions using the second, smaller dataset, which consists of only those responses that we matched from waves 1 to 3 of the survey. The final number in each table’s binary logistics regression code refers to the specific outcome, as listed above in the two sets of independent variables (transit behaviour or quality-of-life indicators).

Thus, for example, a table that is labelled with a binary logistics regression code of 1a7 is the regression that models auto-only commuting (a transit behaviour) for the pooled data, while a table with the code 2b2 is the regression that models the change in time spent with family and friends (a quality-of-life indicator) using only the wave 1 to 3 matched responses.

Explanation of the two datasets for multivariate analysis

The first and largest dataset is the pooled 2,581 separate survey responses we received over the three waves. In these models, the base case is March 2018 wave of survey responses, and we use "dummy" variables to indicate survey responses that come from September 2018 and March 2019.

For the second dataset, we used only responses matched from survey waves 1 and 3 (i.e., the 444 responses that could be matched between the two March surveys), with the subsidy level expressed in the form of change. We used the Wave 3 demographic, geographic and work variables in these regressions. We did not include dummy variables for the hotels in these regressions because of their close correlation with the change in subsidy level. The dependent variables were expressed as changes, either a change to a given transit behaviour (i.e., changed to auto-only commuting) or as a change in reported quality of life (i.e., changed from Very Negative to Neutral physical health).

In most of the transit-behaviour models, we included independent variables describing (A) the percentage level of subsidy, (B) whether a subsidy had been offered, (C) whether it was offered to those in the particular occupation at the particular hotel, and (D) whether it was perceived as offered. We report the regression coefficients obtained from only some of these. In the regressions where the dependent variable was subsidy acceptance, we modelled subsidy level but not subsidy offer (actual, per occupation or perceived) since only workers who were offered a subsidy could accept one. We also excluded the hotel dummy variable in these models. In most of the quality-of-life models, we included independent variables describing (A) subsidy level, (B) transit user (has travelled by transit in the past month), (C) has a monthly Compass Card product, (D) subsidy acceptance, (E) commute by transit only and (F) any commuting by transit. In most of the models of change (in transit behaviour or quality of life) we include independent variables describing both (A) the Wave 1 subsidy level and (B) change in subsidy discount percentage.

To avoid some multicollinearity effects, we excluded the following independent variables from the matched data logistic regressions (which are presented in those tables captioned with a "b"): "leaves home and returns 6 a.m. to 9 p.m." interacted with "has regular shift start and end time," "has driver's licence," "has a second (other) job in core or on transit," and "attended school in core or on transit."

To reduce the number of excluded cases due to missing data, we excluded the following variables from all regressions: "household income," "housing stress," "hourly wage" and "visible minority."

Model framework

We used logistic regression to model the probability or the likelihood of (1) engaging in eight behaviours or outcomes with respect to the transit subsidy and commuting, and (2) eight quality-of-life indicators, as a function of a series of independent variables including demographic characteristics, geographic characteristics (accessibility, sub region), work circumstances, and transit subsidy offer. We modelled each of these outcomes for the two datasets.

The logistic regression model is specified as follows:

$$\text{Log } [P(E)/P(\text{not } E)] = \alpha + \beta_1 X_1 + \ldots . + \beta_i X_i + \varepsilon,$$

where P(E) is the probability of taking transit (or reporting very positive or positive quality of life), P(not E) is the probability of not taking transit, α is the intercept, and β_i is the change in the log odds ratio of taking transit (E) for every unit of change in the independent variable X_i, with all other independent variables taken into account. In the tables that follow, we report the significance and odds ratio (i.e., $\text{Exp}(\beta_i)$).

As a measure of the goodness-of-fit, or the extent to which the models account for variation in the outcome, we report two pseudo–R-square values, the Cox and Snell and Nagelkerke measures. We follow convention by mentioning all coefficients with $p < 0.05$, but also draw attention to some results that range up to $p = 0.1$ if they potentially indicate a salient correlation.

Summary of regression results

1a. Transit behaviour, pooled data for all three waves

1a1: Transit user (used transit in the past month)

Transit use in the past month was positively related to reporting or perceiving that a subsidy was offered. Transit use was also positively related to living in Zone 2 and was related to having a second job in the core. It was negatively related to living downtown and to having access to an automobile. Working at the two hotels located adjacent to SkyTrain stations was also correlated with high likelihood of transit use in the past month.

1a2: Has a monthly Compass Pass product

Having a Compass Card product was positively related ($p = 0.067$) to perceived subsidy offered. Compass Pass product purchase was also more likely for those who had regular shift start and end times, those who left and returned home between 6 a.m. and 9 p.m., and those with more years in the job (at a declining rate). The same was true for immigrant status and living a greater distance from downtown. It was less likely for those who were living downtown, living in Zone 3, working on weekends, or who had an automobile.

1a3: Subsidy acceptance

Subsidy acceptance was significantly and positively related to subsidy level: specifically, for every percentage point increase in the subsidy level, the likelihood of accepting it increased by 3%. Subsidy acceptance was also more likely for those who had more years on the job, lived further from downtown, or were immigrants. It was less likely for those who had an automobile available, had longer transit commute times, or lived downtown.

1a4: Any commuting by transit

These models provided a high degree of explanation of variation in outcomes (over 50% or 0.5 according to the Nagelkerke R-square). Those working in occupations that were offered a subsidy were less likely to use transit in their commutes (alone or in combination with other modes). This is a somewhat surprising finding. However, the fact that the binary logistics regression 1a5 (Table 86), which presents models of "commute by transit only," did not reveal the same relationship suggests that those in unionized positions with subsidies offered were less likely than non-union workers to commute by transit in combination with other modes. We are not sure why this is the case, given the other occupational and work schedule variables included in the model. The other explanatory variables were as we expected: the likelihood of commuting with transit increased for transit-adjacent hotels, living in Zone 2, having no stops on the commute, or being an immigrant. The likelihood decreased for those who lived downtown, had an automobile available or had a valid driver's licence.

1a5: Commute by transit only

These models had a good degree of explanation of variation, and did not identify any of the transit subsidy variables as statistically significantly influences on the likelihood of commuting by transit only. The other explanatory variables were as expected: the likelihood of commuting by transit only increased for transit-adjacent hotels, and for those who lived in Zone 2, worked as a housekeeper, had no stops on their commutes, or who were immigrants. The likelihood decreased for those who lived downtown, had an automobile available or a driver's licence, had a longer commute by transit or had more transit segments in their commutes.

1a6: Commute by active transport only

These models had a good degree of explanation of variation, and they did not identify any of the transit subsidy variables as statistically significantly influences on the likelihood of commuting by active modes only—*as was expected*. The other explanatory variables were as expected: the likelihood of commuting with active modes only increased for those who lived downtown and those who were renters. It decreased for those who had second jobs, who were female or who were immigrants.

1a7: Commute by auto only

These models had a good degree of explanation of variation, and they did not identify any of the transit subsidy variables as statistically significantly influences on the likelihood of

commuting by auto only—*as was expected*. The other explanatory variables were as expected: the likelihood of commuting by auto-only increased for those who had an automobile available, had a driver's licence, who were female, were in low FTN service zones, and had more transit segments. It decreased for those who lived downtown, who had no stops on their commute, who were immigrants, or who were renters.

1a8: Commute by auto and transit

The subsidies did not statistically significantly affect the likelihood of commuting by a combination of transit and auto. Those who had an automobile available or who had kids at home were more likely to commute by this mode. Those living downtown, who made no stops, were housekeepers or who commuted between 6 a.m. and 9 p.m. were less likely to use this mode.

In summary, the subsidy offer increased the chances of Compass product purchase and any transit use, and a higher subsidy level increased the likelihood of subsidy acceptance. However, factors other than the subsidy regime were related to the likelihood of particular commute behaviour. In general, transit users were more likely to be immigrants, living in Zone 2, to have commutes between 6 a.m. and 9 p.m. and to work at transit-adjacent hotels.

1b. Transit behaviour change, waves 1 and 3 matched data

1b1: Transit user (used transit in the past month)

A percentage point increase in the subsidy level increased the likelihood of changing to become a transit user by 4%.

1b3: Subsidy acceptance

An increase of a percentage point in the subsidy level increased the likelihood of changing to accept the subsidy by 3.5%. However, there were diminishing returns, since the higher the initial level of subsidy, the lower the likelihood of accepting the subsidy (i.e., some subsidy holders in Wave 1 dropped the subsidy by Wave 3). Renters were more likely to accept the subsidy.

In summary, these findings support those for the pooled data: higher subsidies were more likely to be accepted, and a higher subsidy level increased the likelihood of using transit at all, though not necessarily for commuting.

2a. Quality of life, waves 1, 2 and 3 pooled data

2a1: Your general happiness with life

Transit users were more likely to be positive or very positive about their general happiness with life.

2a3: Your physical health

Those who accepted the subsidy were more likely to report good or very good health.

2a4: Your level of stress

Those who had a monthly Compass product or had accepted the subsidy were significantly more likely to report feeling "positive" or "very positive" about their levels of stress.

2a5: The predictability of your commute from home to work

There was some support ($p = 0.058$) for the notion that subsidy accepters were more likely to be positive or very positive about the predictability of their commutes to work. Active-only commuters were most likely to report this.

2a6: The predictability of your commute from work to home

Subsidy accepters were more likely to be positive or very positive about the predictability of their commute from work to home. Active-only commuters were most likely to report this.

In summary, subsidy acceptance was related to some positive quality-of-life outcomes, namely health, stress and commute predictability. In other words, subsidy acceptance appears to give workers a general sense of assuredness about their lives, including commute predictability, which may affect workplace outcomes. However, only general happiness with life can be directly related to transit use.

2b. Quality of life, wave 1 and 3 matched data

2b1: Your general happiness with life

A higher initial subsidy level was associated with a greater likelihood of an improved or unchanged general happiness with life.

2b2: The time that you spend with your family and friends

A higher initial level of subsidy was associated with a greater likelihood of an improved or unchanged assessment of time spent with family and friends. However, subsidy acceptance may be associated ($p = 0.083$) with a lower likelihood of an improvement in this assessment.

2b4: Your level of stress

Those accepting a subsidy were more likely to report feeling more positive about their levels of stress.

2b5: The predictability of your commute from home to work

A higher initial level of subsidy was associated with a greater likelihood of an improved or unchanged assessment of the predictability of the commute to work.

2b6: The predictability of your commute from work to home

A higher initial level of subsidy was associated with a greater likelihood of an improved or unchanged assessment of the predictability of the commute back home.

In summary, it is important to note that a higher subsidy level in the first survey was associated with improved or unchanged quality-of-life indicators between Wave 1 and Wave 3—including general happiness with life, level of stress, time with family and friends, and commute predictability. This supports other findings that it takes time for the implications of transit subsidies to become apparent to commuters, since commuting is a learned, routine-based behaviour. Subsidy acceptance was also associated with reported of improved stress levels.

The tables containing the binary logistics regressions follow.

Table 82: Transit use in the past month (binary logistics regression 1a1)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.427	1.008						
Subsidy offered at hotel			0.868	1.078				
Subsidy offered to occupation at hotel					0.785	0.916		
Subsidy reported as offered							0.013	1.689
September	0.344	0.805	0.498	0.860	0.576	0.888	0.363	0.826
Year 2019	0.073	0.599	0.093	0.695	0.113	0.718	0.045	0.664
Hotel E	0.370	0.696	0.512	0.721	0.641	0.810	0.345	0.688
Hotel A	0.001	4.112	0.009	4.573	0.000	5.268	0.000	3.843
Hotel F	0.492	0.729	0.760	0.862	0.946	0.971	0.508	0.776
Hotel B	0.000	4.518	0.006	4.685	0.000	5.394	0.001	3.690
Hotel C	0.419	1.344	0.557	1.387	0.278	1.609	0.853	1.074
Hotel D	0.808	0.897	0.892	1.077	0.590	1.264	0.737	0.889
Live in downtown Vancouver (V6B, C, E, G or Z)	0.013	0.365	0.013	0.364	0.012	0.362	0.007	0.331
Lives in Zone 2	0.054	1.935	0.054	1.936	0.053	1.943	0.019	2.270
Lives in Zone 3	0.387	1.628	0.385	1.633	0.380	1.642	0.309	1.795
Works weekends	0.485	0.886	0.465	0.881	0.459	0.879	0.617	0.916
Leaves home and returns 6 a.m. to 9 p.m.	0.693	1.131	0.686	1.135	0.712	1.123	0.489	1.246
Has regular shift start and end time	0.994	1.002	0.973	1.009	0.993	1.002	0.764	1.085
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.735	1.130	0.752	1.121	0.733	1.131	0.998	0.999
Other job or jobs?	0.172	0.632	0.163	0.626	0.162	0.626	0.094	0.572
Currently attend school?	0.384	0.540	0.412	0.560	0.415	0.563	0.430	0.570
Second job in core or on transit	0.028	2.558	0.028	2.568	0.028	2.568	0.023	2.700
Has access to automobile	0.000	0.172	0.000	0.171	0.000	0.171	0.000	0.154
Housekeeping	0.152	1.722	0.157	1.713	0.152	1.725	0.253	1.550
Food and beverage	0.853	0.933	0.843	0.929	0.850	0.932	0.646	0.840
Guest front-serving	0.427	1.360	0.437	1.352	0.432	1.356	0.603	1.226
Back of house serving, operations	0.270	1.516	0.272	1.515	0.273	1.512	0.281	1.515
Management and admin.	0.712	1.157	0.711	1.159	0.756	1.134	0.750	1.137
School in core or on transit	0.178	3.281	0.196	3.114	0.199	3.093	0.221	2.956
No stops on commute to and from work	0.269	0.833	0.270	0.833	0.265	0.832	0.284	0.835
Do you have a valid driver's licence?	0.186	0.622	0.187	0.622	0.186	0.622	0.152	0.586

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.133	0.766	0.132	0.766	0.127	0.763	0.145	0.769
Years in current job	0.217	0.971	0.217	0.971	0.209	0.971	0.127	0.964
Years in current job, squared	0.815	1.000	0.811	1.000	0.794	1.000	0.597	1.000
Immigrated as a child	0.219	0.741	0.219	0.741	0.220	0.742	0.367	0.799
Immigrated as an adult	0.845	0.961	0.855	0.963	0.860	0.964	0.921	1.021
Children present in household	0.491	0.880	0.501	0.883	0.509	0.885	0.511	0.884
Non-working adult in household	0.461	0.865	0.456	0.864	0.464	0.866	0.698	0.925
Renter	0.149	1.318	0.141	1.326	0.141	1.326	0.140	1.332
FSA-FTN score, quartiles	0.644	1.053	0.648	1.052	0.657	1.051	0.635	1.056
Driving distance from FSA to Burrard Station	0.566	1.031	0.561	1.032	0.567	1.031	0.804	1.014
Average transit time from FSA to Burrard Station	0.392	0.990	0.377	0.989	0.374	0.989	0.245	0.986
Number of transit segments from FSA to Burrard Station	0.131	0.769	0.140	0.774	0.143	0.775	0.148	0.775
Driving distance from FSA to Burrard Station, squared	0.542	0.999	0.542	0.999	0.549	0.999	0.938	1.000
Constant	0.000	48.613	0.000	44.999	0.000	44.942	0.000	56.367
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.142	0.270	0.142	0.269	0.142	0.269	0.149	0.284

Table 83: Compass product purchased (binary logistics regression 1a2)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.401	1.007						
Subsidy offered at hotel			0.888	1.060				
Subsidy offered to occupation at hotel					0.383	0.800		
Subsidy reported as offered							0.067	1.339
September	0.970	1.006	0.717	1.058	0.549	1.095	0.733	1.053
Year 2019	0.693	0.927	0.900	1.020	0.724	1.055	0.989	1.002
Hotel E	0.152	1.712	0.207	1.775	0.060	2.165	0.117	1.784
Hotel A	0.960	0.984	0.868	1.085	0.341	1.388	0.871	1.048
Hotel F	0.689	1.173	0.493	1.346	0.200	1.640	0.476	1.283
Hotel B	0.463	1.238	0.597	1.290	0.146	1.635	0.662	1.139
Hotel C	0.819	0.932	0.952	0.971	0.542	1.248	0.650	0.866
Hotel D	0.071	0.507	0.291	0.595	0.516	0.786	0.041	0.539
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	0.130	0.000	0.130	0.000	0.130	0.000	0.133
Lives in Zone 2	0.830	1.052	0.826	1.053	0.829	1.052	0.936	1.019
Lives in Zone 3	0.040	0.432	0.041	0.433	0.037	0.425	0.029	0.407
Works weekends	0.005	0.689	0.005	0.688	0.005	0.685	0.002	0.659
Leaves home and returns 6 a.m. to 9 p.m.	0.082	1.521	0.085	1.514	0.091	1.503	0.044	1.632
Has regular shift start and end time	0.011	1.710	0.011	1.706	0.012	1.703	0.012	1.703
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.059	0.592	0.061	0.595	0.061	0.595	0.040	0.564
Other job or jobs?	0.664	1.141	0.675	1.135	0.651	1.147	0.663	1.142
Currently attend school?	0.923	1.062	0.905	1.077	0.906	1.075	0.888	1.092
Second job in core or on transit	0.979	1.009	0.976	1.011	0.995	0.998	0.858	0.940
Has access to automobile	0.000	0.346	0.000	0.344	0.000	0.343	0.000	0.325
Housekeeping	0.410	1.227	0.425	1.220	0.385	1.244	0.488	1.191
Food and beverage	0.054	0.615	0.052	0.613	0.063	0.624	0.048	0.603
Guest front-serving	0.222	1.385	0.228	1.380	0.202	1.409	0.268	1.349
Back of house serving, operations	0.558	1.155	0.562	1.153	0.536	1.165	0.590	1.144
Management and admin.	0.096	0.639	0.096	0.639	0.063	0.581	0.091	0.630
School in core or on transit	0.238	2.242	0.247	2.212	0.246	2.209	0.267	2.156
No stops on commute to and from work	0.891	0.983	0.889	0.983	0.881	0.982	0.715	0.956
Do you have a valid driver's licence?	0.218	0.804	0.219	0.804	0.219	0.804	0.312	0.834

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.619	1.068	0.606	1.070	0.626	1.066	0.618	1.069
Years in current job	0.009	1.047	0.009	1.046	0.010	1.046	0.022	1.042
Years in current job, squared	0.004	0.999	0.005	0.999	0.006	0.999	0.009	0.999
Immigrated as a child	0.409	1.173	0.422	1.168	0.418	1.169	0.412	1.173
Immigrated as an adult	0.000	1.815	0.000	1.815	0.000	1.821	0.000	1.789
Children present in household	0.738	0.955	0.775	0.962	0.802	0.966	0.832	0.971
Non-working adult in household	0.222	1.206	0.218	1.208	0.204	1.216	0.286	1.180
Renter	0.325	1.148	0.315	1.151	0.306	1.154	0.331	1.147
FSA-FTN score, quartiles	0.118	0.875	0.119	0.876	0.116	0.875	0.092	0.865
Driving distance from FSA to Burrard Station	0.015	1.097	0.015	1.097	0.015	1.098	0.014	1.099
Average transit time from FSA to Burrard Station	0.272	0.990	0.258	0.990	0.252	0.990	0.411	0.993
Number of transit segments from FSA to Burrard Station	0.901	0.985	0.910	0.986	0.914	0.987	0.904	0.985
Driving distance from FSA to Burrard Station, squared	0.160	0.999	0.163	0.999	0.170	0.999	0.133	0.999
Constant	0.660	1.283	0.710	1.234	0.720	1.225	0.758	1.194
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.236	0.318	0.235	0.318	0.236	0.318	0.239	0.323

Table 84: Subsidy acceptance (binary logistics regression 1a3)

	Model A	
	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.000	1.031
September	0.040	1.363
Year 2019	0.056	1.362
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	0.294
Lives in Zone 2	0.883	1.034
Lives in Zone 3	0.408	1.383
Works weekends	0.448	0.911
Leaves home and returns 6 a.m. to 9 p.m.	0.561	1.155
Has regular shift start and end time	0.083	1.453
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.742	0.912
Other job or jobs?	0.846	0.945
Currently attend school?	0.560	0.680
Second job in core or on transit	0.776	0.911
Has access to automobile	0.000	0.499
Housekeeping	0.396	1.228
Food and beverage	0.921	0.975
Guest front-serving	0.336	1.288
Back of house serving, operations	0.926	1.023
Management and admin.	0.953	0.984
School in core or on transit	0.842	1.152
No stops on commute to and from work	0.654	0.950
Do you have a valid driver's licence?	0.857	0.973
Female	0.227	1.166
Years in current job	0.000	1.094
Years in current job, squared	0.000	0.998
Immigrated as a child	0.163	1.316
Immigrated as an adult	0.010	1.494
Children present in household	0.434	0.905
Non-working adult in household	0.343	1.144
Renter	0.864	1.023
FSA-FTN score, quartiles	0.940	0.994
Driving distance from FSA to Burrard Station	0.028	1.088
Average transit time from FSA to Burrard Station	0.007	0.977
Number of transit segments from FSA to Burrard Station	0.354	0.893
Driving distance from FSA to Burrard Station, squared	0.080	0.999
Constant	0.000	0.115

	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.131	0.188

Table 85: Any transit commuting (binary logistics regression 1a4)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.818	1.002						
Subsidy offered at hotel			0.102	0.504				
Subsidy offered to occupation at hotel					0.043	0.578		
Subsidy reported as offered							0.162	1.274
September	0.329	0.840	0.723	0.940	0.636	0.924	0.323	0.849
Year 2019	0.760	1.068	0.266	1.210	0.276	1.200	0.510	1.114
Hotel E	0.109	1.824	0.019	3.004	0.015	2.788	0.132	1.745
Hotel A	0.000	5.200	0.000	10.852	0.000	8.467	0.000	4.737
Hotel F	0.411	1.392	0.054	2.348	0.044	2.200	0.432	1.311
Hotel B	0.000	3.865	0.000	7.821	0.000	6.143	0.000	3.393
Hotel C	0.434	1.281	0.062	2.580	0.048	2.119	0.769	1.102
Hotel D	0.191	0.606	0.620	1.282	0.801	1.100	0.046	0.543
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	0.024	0.000	0.024	0.000	0.024	0.000	0.023
Lives in Zone 2	0.003	2.188	0.003	2.201	0.003	2.207	0.003	2.215
Lives in Zone 3	0.251	1.665	0.234	1.697	0.260	1.652	0.295	1.600
Works weekends	0.874	1.023	0.915	1.015	0.890	1.020	0.977	1.004
Leaves home and returns 6 a.m. to 9 p.m.	0.798	0.935	0.733	0.915	0.700	0.904	0.846	0.950
Has regular shift start and end time	0.801	0.945	0.776	0.938	0.741	0.928	0.914	0.976
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.275	1.386	0.242	1.419	0.239	1.423	0.307	1.360
Other job or jobs?	0.758	0.912	0.727	0.901	0.771	0.916	0.828	0.936
Currently attend school?	0.023	0.247	0.029	0.261	0.024	0.251	0.027	0.254
Second job in core or on transit	0.265	1.483	0.254	1.499	0.284	1.462	0.309	1.442
Has access to automobile	0.000	0.113	0.000	0.112	0.000	0.112	0.000	0.109
Housekeeping	0.063	1.681	0.055	1.712	0.042	1.768	0.057	1.706
Food and beverage	0.734	1.098	0.727	1.101	0.583	1.165	0.742	1.096
Guest front-serving	0.348	1.312	0.341	1.318	0.247	1.402	0.398	1.280
Back of house serving, operations	0.167	1.456	0.175	1.446	0.133	1.506	0.209	1.414
Management and admin.	0.773	0.920	0.797	0.928	0.366	0.758	0.802	0.929
School in core or on transit	0.004	7.671	0.005	7.239	0.004	7.412	0.005	7.209
No stops on commute to and from work	0.003	1.485	0.003	1.489	0.003	1.478	0.005	1.459
Do you have a valid driver's licence?	0.002	0.470	0.002	0.471	0.002	0.469	0.002	0.468

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.859	1.026	0.885	1.021	0.927	1.013	0.977	1.004
Years in current job	0.520	0.988	0.504	0.987	0.466	0.986	0.327	0.981
Years in current job, squared	0.607	1.000	0.587	1.000	0.549	1.000	0.433	1.000
Immigrated as a child	0.012	1.669	0.010	1.691	0.012	1.674	0.009	1.706
Immigrated as an adult	0.002	1.635	0.002	1.636	0.002	1.645	0.002	1.680
Children present in household	0.966	0.994	0.996	1.001	0.990	1.002	0.968	0.994
Non-working adult in household	0.603	1.089	0.560	1.101	0.542	1.106	0.634	1.082
Renter	0.280	1.180	0.278	1.181	0.245	1.195	0.364	1.151
FSA-FTN score, quartiles	0.080	0.854	0.078	0.853	0.067	0.846	0.106	0.862
Driving distance from FSA to Burrard Station	0.258	1.050	0.264	1.049	0.259	1.050	0.332	1.043
Average transit time from FSA to Burrard Station	0.151	0.986	0.144	0.985	0.149	0.985	0.143	0.985
Number of transit segments from FSA to Burrard Station	0.149	0.818	0.147	0.817	0.163	0.824	0.169	0.825
Driving distance from FSA to Burrard Station, squared	0.731	1.000	0.744	1.000	0.751	1.000	0.904	1.000
Constant	0.002	7.155	0.003	6.734	0.002	6.894	0.002	7.675
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.365	0.506	0.366	0.507	0.366	0.508	0.367	0.509

Table 86: Transit-only commuting (binary logistics regression 1a5)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.332	1.008						
Subsidy offered at hotel			0.358	0.699				
Subsidy offered to occupation at hotel					0.463	0.829		
Subsidy reported as offered							0.143	1.265
September	0.353	0.856	0.807	0.961	0.692	0.940	0.416	0.881
Year 2019	0.937	0.985	0.341	1.165	0.393	1.143	0.614	1.080
Hotel E	0.180	1.597	0.064	2.218	0.074	1.990	0.150	1.638
Hotel A	0.024	2.092	0.007	3.593	0.002	2.929	0.006	2.202
Hotel F	0.955	1.023	0.256	1.611	0.327	1.444	0.699	1.138
Hotel B	0.019	1.966	0.014	3.134	0.005	2.564	0.036	1.854
Hotel C	0.868	0.951	0.382	1.515	0.528	1.254	0.771	0.914
Hotel D	0.038	0.459	0.728	0.849	0.351	0.712	0.022	0.508
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	0.028	0.000	0.028	0.000	0.028	0.000	0.029
Lives in Zone 2	0.002	2.088	0.002	2.089	0.002	2.085	0.003	2.078
Lives in Zone 3	0.099	1.986	0.094	2.005	0.101	1.975	0.112	1.935
Works weekends	0.487	1.097	0.532	1.087	0.521	1.089	0.645	1.064
Leaves home and returns 6 a.m. to 9 p.m.	0.254	1.327	0.272	1.313	0.275	1.312	0.279	1.309
Has regular shift start and end time	0.683	1.092	0.701	1.086	0.702	1.086	0.734	1.076
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.905	0.967	0.937	0.978	0.927	0.974	0.956	0.984
Other job or jobs?	0.987	1.005	0.979	0.992	0.997	0.999	0.930	1.026
Currently attend school?	0.252	0.510	0.292	0.537	0.274	0.525	0.278	0.527
Second job in core or on transit	0.934	1.028	0.919	1.034	0.942	1.024	0.998	0.999
Has access to automobile	0.000	0.174	0.000	0.173	0.000	0.173	0.000	0.169
Housekeeping	0.025	1.803	0.024	1.816	0.022	1.831	0.020	1.845
Food and beverage	0.872	0.958	0.872	0.958	0.924	0.975	0.981	0.994
Guest front-serving	0.954	0.984	0.957	0.985	0.996	1.002	0.996	0.999
Back of house serving, operations	0.165	1.431	0.173	1.424	0.158	1.444	0.147	1.460
Management and admin.	0.455	0.810	0.469	0.815	0.343	0.751	0.565	0.849
School in core or on transit	0.113	2.786	0.135	2.637	0.128	2.681	0.144	2.588
No stops on commute to and from work	0.000	1.995	0.000	2.000	0.000	1.990	0.000	1.960
Do you have a valid driver's licence?	0.002	0.557	0.002	0.557	0.002	0.558	0.004	0.570
Female	0.618	0.935	0.614	0.934	0.608	0.933	0.623	0.935
Years in current job	0.437	0.986	0.425	0.986	0.421	0.986	0.333	0.983
Years in current job, squared	0.475	1.000	0.461	1.000	0.455	1.000	0.409	1.000
Immigrated as a child	0.224	1.268	0.222	1.270	0.233	1.263	0.193	1.291
Immigrated as an adult	0.000	1.758	0.000	1.759	0.000	1.760	0.000	1.782

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Children present in household	0.368	0.883	0.388	0.888	0.388	0.888	0.352	0.879
Non-working adult in household	0.462	0.895	0.475	0.898	0.475	0.898	0.430	0.887
Renter	0.221	1.190	0.221	1.190	0.208	1.197	0.304	1.159
FSA-FTN score, quartiles	0.203	0.899	0.191	0.897	0.186	0.896	0.223	0.903
Driving distance from FSA to Burrard Station	0.249	1.046	0.250	1.046	0.244	1.047	0.260	1.046
Average transit time from FSA to Burrard Station	0.052	0.982	0.049	0.982	0.048	0.982	0.061	0.983
Number of transit segments from FSA to Burrard Station	0.018	0.741	0.019	0.743	0.021	0.745	0.019	0.742
Driving distance from FSA to Burrard Station, squared	0.477	0.999	0.482	0.999	0.482	0.999	0.491	0.999
Constant	0.051	3.134	0.068	2.904	0.064	2.948	0.063	2.997
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.358	0.478	0.358	0.478	0.358	0.478	0.357	0.477

Table 87: Active-only commuting (binary logistics regression 1a6)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.347	1.018						
Subsidy offered at hotel			0.447	1.827				
Subsidy offered to occupation at hotel					0.668	1.237		
Subsidy reported as offered							0.525	0.808
September	0.306	0.680	0.354	0.711	0.437	0.761	0.405	0.748
Year 2019	0.327	0.660	0.452	0.763	0.545	0.810	0.580	0.828
Hotel E	0.897	0.905	0.736	0.734	0.946	0.946	0.876	1.125
Hotel A	0.882	0.901	0.734	0.711	0.854	1.134	0.572	1.408
Hotel F	0.804	0.813	0.860	0.859	0.851	1.146	0.616	1.408
Hotel B	0.297	1.933	0.758	1.353	0.265	2.123	0.115	2.673
Hotel C	0.155	2.520	0.561	1.773	0.152	2.739	0.063	3.396
Hotel D	0.740	1.334	0.823	1.257	0.424	1.888	0.139	2.758
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	27.828	0.000	27.867	0.000	26.887	0.000	22.808
Lives in Zone 2	0.992	0.000	0.992	0.000	0.992	0.000	0.992	0.000
Lives in Zone 3	0.388	0.188	0.408	0.205	0.414	0.209	0.446	0.209
Works weekends	0.672	0.880	0.628	0.864	0.640	0.869	0.852	0.945
Leaves home and returns 6 a.m. to 9 p.m.	0.711	1.206	0.749	1.175	0.736	1.186	0.817	1.124
Has regular shift start and end time	0.231	0.556	0.209	0.541	0.228	0.554	0.192	0.525
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.129	2.521	0.120	2.576	0.125	2.549	0.121	2.591
Other job or jobs?	0.035	0.155	0.031	0.149	0.031	0.150	0.035	0.155
Currently attend school?	0.324	0.193	0.338	0.206	0.361	0.224	0.370	0.231
Second job in core or on transit	0.108	4.347	0.100	4.476	0.099	4.515	0.109	4.370
Has access to automobile	0.186	0.656	0.180	0.652	0.186	0.657	0.247	0.690
Housekeeping	0.155	0.467	0.149	0.462	0.158	0.470	0.122	0.434
Food and beverage	0.936	0.960	0.945	0.966	0.938	0.962	0.956	0.972
Guest front-serving	0.691	0.817	0.699	0.823	0.692	0.818	0.750	0.850
Back of house serving, operations	0.077	0.393	0.085	0.404	0.085	0.404	0.127	0.447
Management and admin.	0.209	0.500	0.214	0.506	0.333	0.569	0.241	0.526
School in core or on transit	0.482	3.441	0.494	3.289	0.516	3.077	0.492	3.274
No stops on commute to and from work	0.292	1.346	0.279	1.357	0.290	1.347	0.280	1.362
Do you have a valid driver's licence?	0.625	1.195	0.624	1.195	0.629	1.192	0.748	1.126

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.000	0.306	0.000	0.308	0.000	0.310	0.000	0.332
Years in current job	0.397	0.958	0.415	0.959	0.435	0.961	0.571	0.970
Years in current job, squared	0.660	0.999	0.641	0.999	0.627	0.999	0.554	0.999
Immigrated as a child	0.012	0.295	0.015	0.305	0.015	0.304	0.013	0.296
Immigrated as an adult	0.334	0.739	0.363	0.752	0.359	0.751	0.334	0.737
Children present in household	0.663	0.823	0.688	0.835	0.698	0.840	0.794	0.889
Non-working adult in household	0.948	0.969	0.922	0.954	0.942	0.965	0.964	1.022
Renter	0.012	2.359	0.012	2.358	0.010	2.406	0.011	2.419
FSA-FTN score, quartiles	0.801	1.083	0.808	1.080	0.787	1.089	0.845	1.066
Driving distance from FSA to Burrard Station	0.405	0.887	0.397	0.886	0.386	0.883	0.398	0.883
Average transit time from FSA to Burrard Station	0.709	0.985	0.722	0.985	0.700	0.984	0.548	0.975
Number of transit segments from FSA to Burrard Station	0.814	0.888	0.826	0.895	0.832	0.898	0.767	0.857
Driving distance from FSA to Burrard Station, squared	0.277	1.003	0.291	1.003	0.277	1.003	0.230	1.003
Constant	0.299	0.218	0.274	0.203	0.244	0.183	0.369	0.263
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.311	0.694	0.311	0.694	0.311	0.693	0.308	0.693

Table 88: Auto-only commuting (binary logistics regression 1a7)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.740	0.997						
Subsidy offered at hotel			0.471	1.394				
Subsidy offered to occupation at hotel					0.309	1.346		
Subsidy reported as offered							0.336	0.824
September	0.159	1.329	0.286	1.231	0.256	1.237	0.139	1.315
Year 2019	0.840	1.052	0.780	0.947	0.759	0.944	0.948	0.988
Hotel E	0.097	0.507	0.065	0.389	0.040	0.394	0.096	0.512
Hotel A	0.000	0.109	0.000	0.073	0.000	0.081	0.000	0.113
Hotel F	0.436	0.708	0.176	0.520	0.130	0.522	0.349	0.701
Hotel B	0.000	0.195	0.000	0.134	0.000	0.149	0.000	0.214
Hotel C	0.044	0.491	0.054	0.340	0.015	0.366	0.106	0.550
Hotel D	0.519	1.310	0.766	0.850	0.779	0.892	0.397	1.325
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	0.216	0.000	0.217	0.000	0.216	0.001	0.228
Lives in Zone 2	0.051	0.561	0.049	0.559	0.050	0.560	0.040	0.542
Lives in Zone 3	0.501	0.719	0.488	0.711	0.507	0.722	0.509	0.722
Works weekends	0.938	1.013	0.901	1.020	0.903	1.020	0.926	1.015
Leaves home and returns 6 a.m. to 9 p.m.	0.868	1.051	0.835	1.064	0.800	1.079	0.917	1.032
Has regular shift start and end time	0.256	1.338	0.248	1.345	0.234	1.357	0.323	1.289
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.081	0.552	0.076	0.546	0.073	0.543	0.103	0.572
Other job or jobs?	0.386	1.341	0.370	1.353	0.386	1.340	0.421	1.314
Currently attend school?	0.001	7.982	0.001	7.723	0.001	7.969	0.001	7.739
Second job in core or on transit	0.124	0.532	0.119	0.527	0.129	0.536	0.162	0.559
Has access to automobile	0.000	14.961	0.000	15.045	0.000	15.066	0.000	15.572
Housekeeping	0.116	0.578	0.114	0.576	0.102	0.565	0.129	0.587
Food and beverage	0.594	0.830	0.609	0.836	0.556	0.814	0.643	0.849
Guest front-serving	0.326	0.697	0.333	0.701	0.295	0.680	0.372	0.718
Back of house serving, operations	0.503	0.796	0.528	0.806	0.486	0.789	0.521	0.801
Management and office	0.323	1.426	0.320	1.428	0.216	1.585	0.309	1.446
School in core or on transit	0.000	0.064	0.000	0.067	0.000	0.066	0.000	0.068
No stops on commute to and from work	0.000	0.559	0.000	0.560	0.000	0.562	0.000	0.573
Do you have a valid driver's licence?	0.001	4.121	0.001	4.084	0.001	4.087	0.001	3.995

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.021	1.455	0.019	1.461	0.019	1.465	0.028	1.431
Years in current job	0.066	1.041	0.064	1.041	0.057	1.042	0.044	1.045
Years in current job, squared	0.131	0.999	0.128	0.999	0.117	0.999	0.094	0.999
Immigrated as a child	0.086	0.687	0.082	0.683	0.087	0.687	0.077	0.678
Immigrated as an adult	0.006	0.603	0.006	0.603	0.006	0.602	0.005	0.594
Children present in household	0.921	0.984	0.897	0.979	0.890	0.978	0.854	0.970
Non-working adult in household	0.981	0.996	0.947	0.988	0.952	0.989	0.930	0.984
Renter	0.001	0.550	0.001	0.549	0.001	0.545	0.001	0.560
FSA-FTN score, quartiles	0.014	1.272	0.013	1.274	0.012	1.280	0.016	1.269
Driving distance from FSA to Burrard Station	0.302	0.952	0.304	0.952	0.301	0.952	0.392	0.960
Average transit time from FSA to Burrard Station	0.761	1.003	0.746	1.004	0.743	1.004	0.676	1.005
Number of transit segments from FSA to Burrard Station	0.012	1.467	0.012	1.465	0.013	1.457	0.013	1.459
Driving distance from FSA to Burrard Station, squared	0.711	1.000	0.717	1.000	0.725	1.000	0.917	1.000
Constant	0.000	0.033	0.000	0.034	0.000	0.033	0.000	0.031
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.343	0.519	0.343	0.519	0.343	0.520	0.342	0.518

Table 89: Auto and transit commuting (binary logistics regression 1a8)

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.578	0.994						
Subsidy offered at hotel			0.902	0.937				
Subsidy offered to occupation at hotel					0.242	0.682		
Subsidy reported as offered							0.272	0.802
September	0.449	0.848	0.307	0.811	0.393	0.843	0.380	0.840
Year 2019	0.941	1.018	0.760	0.941	0.928	0.983	0.923	0.981
Hotel E	0.586	1.322	0.678	1.291	0.382	1.609	0.585	1.316
Hotel A	0.029	2.786	0.155	2.578	0.012	3.312	0.017	2.688
Hotel F	0.775	1.175	0.943	1.043	0.616	1.308	0.862	1.090
Hotel B	0.053	2.267	0.225	2.207	0.028	2.805	0.031	2.487
Hotel C	0.138	1.961	0.339	1.909	0.073	2.482	0.116	2.038
Hotel D	0.550	1.379	0.777	1.210	0.333	1.648	0.470	1.370
Live in downtown Vancouver (V6B, C, E, G or Z)	0.004	0.050	0.004	0.050	0.004	0.049	0.004	0.048
Lives in Zone 2	0.256	0.717	0.260	0.718	0.271	0.723	0.270	0.721
Lives in Zone 3	0.230	0.555	0.229	0.554	0.225	0.551	0.224	0.549
Works weekends	0.785	0.955	0.797	0.957	0.760	0.950	0.907	0.980
Leaves home and returns 6 a.m. to 9 p.m.	0.039	0.525	0.039	0.524	0.034	0.514	0.042	0.525
Has regular shift start and end time	0.268	0.762	0.262	0.759	0.242	0.751	0.389	0.808
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.075	1.890	0.074	1.897	0.072	1.906	0.094	1.837
Other job or jobs?	0.290	0.634	0.292	0.635	0.292	0.635	0.258	0.608
Currently attend school?	0.260	0.299	0.258	0.297	0.263	0.302	0.249	0.291
Second job in core or on transit	0.139	2.008	0.139	2.008	0.144	1.988	0.124	2.098
Has access to automobile	0.022	1.594	0.021	1.598	0.023	1.587	0.018	1.621
Housekeeping	0.036	0.429	0.037	0.430	0.049	0.449	0.026	0.395
Food and beverage	0.476	0.755	0.480	0.757	0.538	0.784	0.308	0.659
Guest front-serving	0.699	0.855	0.703	0.857	0.774	0.890	0.537	0.772
Back of house serving, operations	0.167	0.581	0.168	0.581	0.193	0.598	0.110	0.520
Management and admin.	0.454	0.734	0.453	0.734	0.273	0.614	0.301	0.643
School in core or on transit	0.210	4.061	0.206	4.116	0.216	3.990	0.192	4.307
No stops on commute to and from work	0.022	0.697	0.022	0.697	0.019	0.692	0.018	0.686
Do you have a valid driver's licence?	0.754	1.081	0.749	1.083	0.732	1.089	0.774	1.074

	Model A		Model B		Model C		Model D	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Female	0.179	1.257	0.182	1.255	0.193	1.249	0.204	1.243
Years in current job	0.221	0.973	0.223	0.973	0.212	0.972	0.230	0.973
Years in current job, squared	0.371	1.001	0.374	1.001	0.361	1.001	0.347	1.001
Immigrated as a child	0.343	1.244	0.332	1.250	0.339	1.246	0.386	1.223
Immigrated as an adult	0.351	0.835	0.357	0.836	0.365	0.839	0.384	0.843
Children present in household	0.060	1.365	0.062	1.362	0.061	1.364	0.051	1.384
Non-working adult in household	0.074	1.377	0.072	1.379	0.068	1.387	0.060	1.404
Renter	0.915	1.020	0.924	1.018	0.897	1.024	0.786	1.051
FSA-FTN score, quartiles	0.299	1.111	0.294	1.112	0.305	1.109	0.242	1.127
Driving distance from FSA to Burrard Station	0.591	1.026	0.598	1.025	0.602	1.025	0.671	1.020
Average transit time from FSA to Burrard Station	0.285	1.012	0.277	1.012	0.295	1.012	0.374	1.010
Number of transit segments from FSA to Burrard Station	0.413	1.136	0.418	1.134	0.402	1.140	0.389	1.144
Driving distance from FSA to Burrard Station, squared	0.706	1.000	0.710	1.000	0.736	1.000	0.855	1.000
Constant	0.000	0.062	0.000	0.064	0.000	0.065	0.001	0.071
	Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.077	0.150	0.077	0.149	0.078	0.151	0.077	0.149

Table 90: Change to become a transit user (binary logistics regression 1b1)

	Model A	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.361	0.953
Change in subsidy discount percentage	0.030	1.044
Live in downtown Vancouver (V6B, C, E, G or Z)	0.260	10.452
Lives in Zone 2	0.188	0.084
Lives in Zone 3	0.566	5.398
Works weekends	0.613	0.688
Leaves home and returns 6 a.m. to 9 p.m.	0.721	1.331
Has regular shift start and end time	0.640	0.683
Other job or jobs?	0.639	0.551
Currently attend school?	0.999	0.000
Housekeeping	0.998	0.000
Food and beverage	0.998	0.000
Guest front-serving	0.998	0.000
Back of house serving, operations	0.998	0.000
Management and admin.	0.998	0.000
No stops on commute to and from work	0.796	1.219
Female	0.692	0.749
Years in current job	0.089	0.832
Years in current job, squared	0.096	1.004
Immigrated as a child	0.337	0.369
Immigrated as an adult	0.093	0.196
Children present in household	0.496	1.772
Non-working adult in household	1.000	1.000
Renter	0.149	0.314
FSA-FTN score, quartiles	0.478	0.706
Driving distance from FSA to Burrard Station	0.208	1.612
Average transit time from FSA to Burrard Station	0.810	0.985
Number of transit segments from FSA to Burrard Station	0.625	1.486
Driving distance from FSA to Burrard Station, squared	0.093	0.984
Constant	0.999	3,026,474.079
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.087	0.292

Table 91: Change to accept subsidy (binary logistics regression 1b3)

	Model A	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.034	0.943
Change in subsidy discount percentage	0.001	1.035
Live in downtown Vancouver (V6B, C, E, G or Z)	0.998	0.000
Lives in Zone2	0.337	0.469
Lives in Zone3	0.253	0.220
Works weekends	0.140	1.769
Leaves home and returns 6 a.m. to 9 p.m.	0.661	1.189
Has regular shift start and end time	0.385	1.489
Other job or jobs?	0.545	0.715
Currently attend school?	0.588	1.590
Housekeeping	0.351	0.469
Food and beverage	0.817	0.827
Guest front-serving	0.449	1.869
Back of house serving, operations	0.193	0.333
Management and admin.	0.847	1.198
No stops on commute to and from work	0.727	1.137
Female	0.228	0.630
Years in current job	0.983	0.999
Years in current job, squared	0.796	1.000
Immigrated as a child	0.895	1.083
Immigrated as an adult	0.301	1.700
Children present in household	0.117	1.762
Non-working adult in household	0.338	0.666
Renter	0.028	2.305
FSA-FTN score, quartiles	0.481	1.182
Driving distance from FSA to Burrard Station	0.031	1.335
Average transit time from FSA to Burrard Station	0.419	0.977
Number of transit segments from FSA to Burrard Station	0.216	0.619
Driving distance from FSA to Burrard Station, squared	0.099	0.996
Constant	0.046	0.040
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.201	0.324

Table 92: Positive or very positive general happiness with life (binary logistics regression 2a1)

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.832	1.002										
Transit user (has travelled in past month)			0.042	1.546								
Has a monthly Compass Card product					0.312	0.838						
Subsidy acceptance							0.356	1.162				
Commute on transit only									0.516	1.118		
Any commuting by transit											0.850	1.036
September	0.575	0.896	0.730	0.940	0.728	0.936	0.557	0.901	0.609	0.913	0.604	0.912
Year 2019	0.112	0.693	0.075	0.736	0.119	0.748	0.041	0.702	0.050	0.714	0.051	0.716
Hotel E	0.076	0.512	0.081	0.531	0.048	0.443	0.067	0.514	0.071	0.520	0.073	0.523
Hotel A	0.887	0.946	0.971	0.988	0.590	0.822	0.857	0.943	0.949	0.980	0.964	0.986
Hotel F	0.811	1.122	0.582	1.244	0.800	0.894	0.774	1.122	0.672	1.183	0.665	1.187
Hotel B	0.617	1.193	0.649	1.160	0.999	1.001	0.644	1.165	0.551	1.215	0.542	1.221
Hotel C	0.187	0.627	0.159	0.632	0.085	0.532	0.140	0.615	0.179	0.646	0.178	0.646
Hotel D	0.201	0.566	0.113	0.605	0.029	0.455	0.089	0.581	0.123	0.614	0.116	0.608
Live in downtown Vancouver (V6B, C, E, G or Z)	0.987	0.994	0.991	1.004	0.823	0.914	0.943	1.027	0.879	1.060	0.970	1.014
Lives in Zone 2	0.544	1.182	0.611	1.151	0.745	1.099	0.542	1.183	0.570	1.170	0.553	1.178
Lives in Zone 3	0.814	1.121	0.866	1.086	0.477	0.695	0.818	1.118	0.824	1.114	0.817	1.119
Works weekends	0.111	0.784	0.108	0.782	0.504	0.896	0.108	0.782	0.109	0.783	0.108	0.783
Leaves home and returns 6 a.m. to 9 p.m.	0.082	1.630	0.108	1.575	0.085	1.698	0.084	1.625	0.085	1.622	0.082	1.630
Has regular shift start and end time	0.357	1.240	0.405	1.217	0.322	1.289	0.373	1.231	0.354	1.241	0.355	1.241
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.140	0.621	0.133	0.613	0.081	0.540	0.138	0.619	0.138	0.619	0.139	0.620
Other job or jobs?	0.002	0.412	0.003	0.420	0.000	0.310	0.002	0.410	0.002	0.411	0.002	0.411
Currently attend	0.806	1.181	0.761	1.231	0.269	3.332	0.801	1.186	0.779	1.210	0.791	1.197

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
school?												
Second job in core or on transit	0.067	1.856	0.089	1.779	0.011	2.520	0.065	1.865	0.066	1.860	0.067	1.855
Has access to automobile	0.001	1.773	0.000	1.938	0.002	1.753	0.000	1.809	0.001	1.841	0.001	1.791
Housekeeping	0.012	0.528	0.010	0.518	0.071	0.615	0.011	0.523	0.011	0.523	0.012	0.527
Food and beverage	0.066	0.617	0.057	0.606	0.061	0.595	0.065	0.616	0.065	0.617	0.065	0.616
Guest front-serving	0.011	0.494	0.008	0.475	0.019	0.496	0.010	0.488	0.011	0.494	0.011	0.493
Back of house serving, operations	0.046	0.603	0.043	0.597	0.051	0.591	0.044	0.599	0.043	0.599	0.045	0.601
Management and admin.	0.278	0.721	0.261	0.712	0.945	0.978	0.268	0.716	0.284	0.724	0.279	0.722
School in core or on transit	0.729	0.775	0.659	0.722	0.293	0.305	0.727	0.774	0.701	0.754	0.712	0.762
No stops on commute to and from work	0.594	1.077	0.507	1.098	0.440	1.124	0.578	1.081	0.645	1.067	0.603	1.076
Do you have a valid driver's licence?	0.041	0.682	0.049	0.691	0.047	0.679	0.041	0.681	0.044	0.686	0.042	0.683
Female	0.133	0.792	0.168	0.806	0.144	0.783	0.126	0.789	0.135	0.793	0.132	0.792
Years in current job	0.519	0.986	0.472	0.984	0.211	0.970	0.442	0.984	0.524	0.986	0.520	0.986
Years in current job, squared	0.335	1.001	0.248	1.001	0.057	1.001	0.281	1.001	0.336	1.001	0.334	1.001
Immigrated as a child	0.971	0.991	0.981	0.994	0.902	1.034	0.941	0.982	0.961	0.988	0.963	0.989
Immigrated as an adult	0.217	0.796	0.256	0.810	0.214	0.780	0.197	0.787	0.203	0.790	0.215	0.795
Children present in household	0.377	1.149	0.417	1.136	0.414	1.147	0.370	1.151	0.373	1.150	0.377	1.149
Non-working adult in household	0.341	0.849	0.362	0.854	0.310	0.826	0.333	0.846	0.341	0.849	0.337	0.848
Renter	0.238	1.211	0.281	1.192	0.186	1.258	0.239	1.211	0.244	1.209	0.238	1.212
FSA-FTN score, quartiles	0.328	1.101	0.298	1.108	0.216	1.142	0.336	1.099	0.315	1.104	0.325	1.101
Driving distance from FSA to Burrard Station	0.776	0.987	0.735	0.984	0.776	1.015	0.746	0.985	0.761	0.986	0.775	0.987
Average transit time from FSA to Burrard Station	0.270	0.989	0.217	0.987	0.040	0.977	0.292	0.989	0.281	0.989	0.270	0.989
Number of transit segments from FSA to	0.183	0.821	0.270	0.849	0.256	0.838	0.188	0.824	0.195	0.826	0.185	0.823

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Burrard Station												
Driving distance from FSA to Burrard Station, squared	0.404	1.001	0.352	1.001	0.350	1.001	0.388	1.001	0.398	1.001	0.405	1.001
Constant	0.000	25.874	0.000	17.163	0.000	30.769	0.000	26.310	0.000	23.461	0.000	24.713
	Model summary		Model summary		Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.049	0.084	0.052	0.090	0.060	0.104	0.049	0.085	0.049	0.085	0.049	0.084

Table 93: Good or very good health (binary logistics regression 2a3)

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.431	1.006										
Transit user (has travelled in past month)			0.973	1.006								
Has a monthly Compass Card product					0.686	1.056						
Subsidy acceptance							0.037	1.316				
Commute on transit only									0.768	1.041		
Any commuting by transit											0.790	1.039
September	0.019	0.696	0.028	0.736	0.052	0.752	0.018	0.718	0.027	0.735	0.027	0.735
Year 2019	0.006	0.602	0.003	0.661	0.013	0.695	0.001	0.637	0.003	0.661	0.003	0.661
Hotel E	0.089	0.583	0.121	0.623	0.215	0.662	0.098	0.603	0.119	0.621	0.119	0.621
Hotel A	0.142	0.638	0.206	0.725	0.283	0.750	0.122	0.673	0.208	0.726	0.206	0.724
Hotel F	0.064	0.514	0.087	0.606	0.053	0.544	0.044	0.549	0.086	0.605	0.086	0.604
Hotel B	0.615	0.871	0.831	0.947	0.990	1.003	0.580	0.868	0.814	0.942	0.808	0.940
Hotel C	0.195	0.690	0.279	0.751	0.490	0.823	0.172	0.694	0.279	0.751	0.277	0.750
Hotel D	0.040	0.488	0.041	0.596	0.057	0.594	0.020	0.551	0.039	0.591	0.039	0.591
Live in downtown Vancouver (V6B, C, E, G or Z)	0.531	0.839	0.553	0.847	0.620	0.861	0.656	0.882	0.596	0.858	0.595	0.857
Lives in Zone 2	0.038	1.583	0.040	1.576	0.092	1.482	0.037	1.589	0.039	1.578	0.039	1.579
Lives in Zone 3	0.833	1.085	0.842	1.080	0.552	0.782	0.825	1.090	0.833	1.085	0.831	1.086
Works weekends	0.034	0.775	0.032	0.773	0.151	0.831	0.034	0.776	0.031	0.772	0.031	0.772
Leaves home and returns 6 a.m. to 9 p.m.	0.789	1.059	0.759	1.068	0.799	0.943	0.817	1.051	0.806	1.054	0.797	1.057
Has regular shift start and end time	0.394	1.176	0.355	1.193	0.460	1.166	0.430	1.162	0.393	1.176	0.391	1.177
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.999	1.000	0.968	0.990	0.739	1.094	0.984	0.995	0.995	1.002	1.000	1.000
Other job or jobs?	0.502	0.836	0.488	0.831	0.409	0.783	0.517	0.842	0.490	0.832	0.492	0.833
Currently attend school?	0.889	1.081	0.867	1.097	0.253	2.438	0.857	1.105	0.861	1.102	0.858	1.105
Second job in core or on transit	0.408	1.285	0.398	1.292	0.353	1.363	0.401	1.289	0.403	1.288	0.406	1.286

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Has access to automobile	0.015	1.388	0.018	1.381	0.017	1.411	0.008	1.430	0.017	1.400	0.017	1.398
Housekeeping	0.007	0.553	0.006	0.548	0.005	0.529	0.006	0.544	0.007	0.550	0.007	0.551
Food and beverage	0.285	0.786	0.277	0.784	0.167	0.724	0.277	0.783	0.279	0.785	0.277	0.784
Guest front-serving	0.450	0.835	0.475	0.843	0.309	0.776	0.400	0.818	0.446	0.834	0.443	0.833
Back of house serving, operations	0.012	0.577	0.011	0.575	0.007	0.541	0.011	0.571	0.012	0.576	0.012	0.576
Management and office	0.742	0.922	0.737	0.920	0.968	0.990	0.740	0.921	0.755	0.926	0.752	0.925
School in core or on transit	0.617	0.740	0.593	0.725	0.162	0.320	0.600	0.730	0.589	0.722	0.585	0.720
No stops on commute to and from work	0.851	0.979	0.879	0.983	0.990	1.002	0.881	0.983	0.828	0.976	0.841	0.978
Do you have a valid driver's licence?	0.021	0.703	0.023	0.706	0.038	0.721	0.021	0.704	0.023	0.706	0.022	0.705
Female	0.001	0.664	0.001	0.669	0.003	0.682	0.001	0.658	0.001	0.666	0.001	0.665
Years in current job	0.308	0.983	0.317	0.983	0.233	0.979	0.199	0.979	0.313	0.983	0.313	0.983
Years in current job, squared	0.170	1.001	0.184	1.001	0.129	1.001	0.105	1.001	0.173	1.001	0.172	1.001
Immigrated as a child	0.416	1.157	0.435	1.151	0.504	1.139	0.454	1.144	0.423	1.155	0.427	1.153
Immigrated as an adult	0.026	1.366	0.029	1.358	0.054	1.333	0.037	1.341	0.027	1.364	0.027	1.365
Children present in household	0.873	0.980	0.881	0.982	0.902	1.017	0.929	0.989	0.897	0.984	0.891	0.983
Non-working adult in household	0.887	1.020	0.906	1.017	0.856	1.028	0.930	1.012	0.892	1.019	0.897	1.018
Renter	0.803	1.032	0.763	1.039	0.776	1.040	0.806	1.032	0.804	1.032	0.800	1.033
FSA-FTN score, quartiles	0.411	0.939	0.399	0.937	0.302	0.917	0.404	0.938	0.420	0.940	0.416	0.939
Driving distance from FSA to Burrard Station	0.696	0.986	0.723	0.987	0.948	1.003	0.605	0.981	0.693	0.986	0.698	0.986
Average transit time from FSA to Burrard Station	0.499	0.994	0.523	0.995	0.225	0.989	0.579	0.995	0.498	0.994	0.493	0.994
Number of transit segments from FSA to Burrard Station	0.748	0.963	0.742	0.962	0.806	0.970	0.810	0.972	0.770	0.966	0.765	0.966
Driving distance from FSA to Burrard Station, squared	0.495	1.000	0.524	1.000	0.483	1.001	0.438	1.001	0.494	1.000	0.498	1.000
Constant	0.000	10.092	0.000	9.249	0.000	9.300	0.000	10.042	0.000	9.309	0.000	9.303
	Model summary		Model summary		Model summary		Model summary		Model summary		Model summary	

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.051	0.072	0.050	0.071	0.057	0.080	0.053	0.075	0.051	0.072	0.051	0.072

Table 94: Low or very low stress level (binary logistics regression 2a4)

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.665	0.997										
Transit user (has travelled in past month)			0.944	0.988								
Has a monthly Compass Card product					0.066	1.268						
Subsidy acceptance							0.011	1.366				
Commute on transit only									0.133	1.213		
Any commuting by transit											0.246	1.170
September	0.177	1.215	0.163	1.201	0.131	1.236	0.269	1.157	0.196	1.185	0.189	1.188
Year 2019	0.407	1.151	0.422	1.111	0.388	1.130	0.661	1.060	0.494	1.094	0.486	1.096
Hotel E	0.119	0.621	0.084	0.600	0.091	0.578	0.064	0.578	0.072	0.587	0.074	0.590
Hotel A	0.353	0.771	0.163	0.727	0.125	0.688	0.067	0.655	0.114	0.698	0.110	0.693
Hotel F	0.627	0.850	0.371	0.784	0.244	0.704	0.201	0.702	0.358	0.778	0.353	0.776
Hotel B	0.316	0.781	0.191	0.745	0.132	0.694	0.084	0.675	0.158	0.729	0.151	0.724
Hotel C	0.210	0.720	0.107	0.679	0.041	0.588	0.056	0.628	0.113	0.684	0.111	0.682
Hotel D	0.387	0.755	0.100	0.684	0.073	0.633	0.052	0.636	0.116	0.695	0.115	0.694
Live in downtown Vancouver (V6B, C, E, G or Z)	0.580	0.864	0.559	0.857	0.659	1.136	0.742	0.916	0.865	0.955	0.816	0.938
Lives in Zone 2	0.391	1.199	0.388	1.201	0.705	1.089	0.395	1.198	0.450	1.174	0.428	1.183
Lives in Zone 3	0.827	1.084	0.832	1.082	0.695	0.855	0.854	1.071	0.866	1.065	0.846	1.075
Works weekends	0.046	0.799	0.047	0.799	0.188	0.851	0.054	0.804	0.048	0.800	0.049	0.801
Leaves home and returns 6 a.m. to 9 p.m.	0.599	0.894	0.563	0.884	0.643	0.897	0.588	0.891	0.583	0.890	0.621	0.900
Has regular shift start and end time	0.511	1.128	0.542	1.119	0.418	1.177	0.599	1.102	0.524	1.124	0.509	1.129
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.305	1.284	0.307	1.283	0.455	1.220	0.307	1.284	0.309	1.282	0.329	1.269
Other job or jobs?	0.236	0.732	0.245	0.736	0.464	0.807	0.248	0.737	0.243	0.735	0.242	0.734
Currently attend	0.356	1.614	0.370	1.591	0.480	1.493	0.364	1.606	0.346	1.633	0.337	1.647

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
school?												
Second job in core or on transit	0.216	1.441	0.221	1.437	0.348	1.357	0.211	1.448	0.221	1.436	0.228	1.429
Has access to automobile	0.180	1.191	0.173	1.197	0.194	1.198	0.107	1.235	0.085	1.263	0.105	1.245
Housekeeping	0.008	0.522	0.008	0.523	0.009	0.514	0.006	0.512	0.006	0.511	0.007	0.516
Food and beverage	0.260	0.759	0.253	0.756	0.144	0.684	0.269	0.762	0.259	0.758	0.256	0.757
Guest front-serving	0.011	0.522	0.012	0.524	0.007	0.478	0.010	0.517	0.011	0.521	0.011	0.518
Back of house serving, operations	0.022	0.576	0.025	0.582	0.014	0.536	0.022	0.575	0.020	0.571	0.021	0.572
Management and admin.	0.028	0.559	0.027	0.558	0.038	0.560	0.026	0.556	0.028	0.559	0.027	0.558
School in core or on transit	0.402	0.621	0.418	0.631	0.473	0.642	0.425	0.634	0.383	0.608	0.371	0.600
No stops on commute to and from work	0.637	1.052	0.568	1.063	0.699	1.045	0.590	1.059	0.779	1.031	0.697	1.043
Do you have a valid driver's licence?	0.833	0.969	0.889	0.979	0.913	0.983	0.841	0.970	0.919	0.985	0.885	0.978
Female	0.000	0.644	0.000	0.652	0.001	0.657	0.000	0.636	0.000	0.646	0.000	0.643
Years in current job	0.922	0.998	0.923	0.999	0.799	0.996	0.672	0.993	0.950	0.999	0.951	0.999
Years in current job, squared	0.474	1.000	0.467	1.000	0.247	1.001	0.302	1.000	0.493	1.000	0.495	1.000
Immigrated as a child	0.062	0.724	0.059	0.721	0.020	0.643	0.051	0.713	0.056	0.719	0.053	0.716
Immigrated as an adult	0.968	0.995	0.961	0.994	0.735	0.953	0.840	0.974	0.869	0.978	0.906	0.984
Children present in household	0.495	0.921	0.435	0.910	0.407	0.898	0.506	0.923	0.497	0.921	0.478	0.918
Non-working adult in household	0.060	1.282	0.055	1.289	0.043	1.335	0.061	1.281	0.058	1.285	0.062	1.280
Renter	0.831	0.974	0.821	0.973	0.997	1.000	0.815	0.972	0.794	0.968	0.806	0.970
FSA-FTN score, quartiles	0.076	0.873	0.086	0.877	0.016	0.815	0.073	0.872	0.084	0.876	0.082	0.875
Driving distance from FSA to Burrard Station	0.580	0.981	0.571	0.981	0.847	0.993	0.485	0.976	0.538	0.979	0.558	0.980
Average transit time from FSA to Burrard Station	0.139	0.988	0.124	0.988	0.255	0.990	0.196	0.990	0.162	0.989	0.149	0.988
Number of transit segments from FSA to	0.462	1.086	0.415	1.096	0.381	1.110	0.428	1.093	0.410	1.097	0.440	1.091

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Burrard Station												
Driving distance from FSA to Burrard Station, squared	0.172	1.001	0.165	1.001	0.231	1.001	0.144	1.001	0.159	1.001	0.167	1.001
Constant	0.121	2.214	0.129	2.252	0.272	1.825	0.094	2.352	0.181	1.995	0.175	2.022
	Model summary		Model summary		Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.049	0.067	0.050	0.068	0.058	0.080	0.053	0.072	0.050	0.069	0.050	0.068

Table 95: Positive or very positive predictability of commute from home to work (binary logistics regression 2a5)

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.170	0.990										
Transit user (has travelled in past month)			0.263	1.211								
Has a monthly Compass Card product					0.393	1.119						
Subsidy acceptance							0.058	1.272				
Commute on transit only									0.607	0.935		
Any commuting by transit											0.008	2.491
September	0.867	1.025	0.701	0.950	0.646	0.937	0.539	0.921	0.638	0.939	0.671	0.945
Year 2019	0.274	1.213	0.678	1.057	0.311	1.158	0.971	1.005	0.789	1.037	0.743	1.045
Hotel E	0.409	0.775	0.259	0.713	0.329	0.724	0.192	0.677	0.233	0.701	0.222	0.694
Hotel A	0.424	1.271	0.972	0.991	0.894	0.965	0.812	0.942	0.926	1.024	0.979	1.007
Hotel F	0.811	0.919	0.239	0.709	0.430	0.773	0.137	0.645	0.233	0.706	0.229	0.704
Hotel B	0.934	0.978	0.431	0.823	0.303	0.759	0.332	0.785	0.537	0.859	0.478	0.840
Hotel C	0.240	0.720	0.061	0.614	0.085	0.614	0.039	0.582	0.072	0.627	0.053	0.605
Hotel D	0.689	0.874	0.073	0.640	0.057	0.594	0.041	0.598	0.066	0.634	0.062	0.629
Live in downtown Vancouver (V6B, C, E, G or Z)	0.000	3.201	0.000	3.253	0.000	3.767	0.000	3.362	0.000	3.084	0.033	2.052
Lives in Zone 2	0.268	0.791	0.222	0.772	0.284	0.787	0.258	0.787	0.282	0.796	0.304	0.804
Lives in Zone 3	0.032	0.454	0.026	0.443	0.052	0.466	0.028	0.447	0.031	0.454	0.033	0.455
Works weekends	0.052	0.797	0.061	0.803	0.547	0.926	0.062	0.804	0.060	0.803	0.062	0.804
Leaves home and returns 6 a.m. to 9.p.m	0.755	1.069	0.803	1.055	0.978	0.994	0.754	1.069	0.734	1.075	0.766	1.066
Has regular shift start and end time	0.330	1.198	0.362	1.185	0.368	1.200	0.373	1.180	0.337	1.195	0.287	1.219
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.467	1.196	0.471	1.195	0.378	1.265	0.482	1.190	0.469	1.195	0.521	1.172
Other job or jobs?	0.129	0.675	0.147	0.687	0.056	0.575	0.140	0.682	0.135	0.679	0.165	0.698
Currently attend school?	0.129	2.473	0.142	2.403	0.082	3.898	0.140	2.411	0.147	2.373	0.133	2.445
Second job in core or on transit	0.256	1.397	0.283	1.372	0.157	1.585	0.251	1.402	0.258	1.395	0.280	1.374
Has access to automobile	0.068	1.279	0.037	1.331	0.035	1.355	0.037	1.326	0.100	1.260	0.050	1.302
Housekeeping	0.021	0.599	0.024	0.604	0.011	0.554	0.020	0.594	0.025	0.607	0.027	0.610
Food and beverage	0.715	1.088	0.706	1.091	0.879	1.037	0.697	1.094	0.692	1.096	0.678	1.100
Guest front-serving	0.851	0.955	0.857	0.957	0.502	0.841	0.820	0.946	0.873	0.962	0.892	0.967
Back of house serving, operations	0.208	0.756	0.200	0.752	0.072	0.660	0.209	0.756	0.225	0.763	0.260	0.779

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Management and admin.	0.864	1.044	0.893	1.034	0.654	1.125	0.874	1.041	0.865	1.044	0.788	1.070
School in core or on transit	0.025	0.238	0.027	0.243	0.014	0.134	0.029	0.249	0.030	0.250	0.026	0.243
No stops on commute to and from work	0.909	1.013	0.817	1.026	0.146	1.186	0.885	1.016	0.857	1.020	0.939	1.008
Do you have a valid driver's licence?	0.031	0.717	0.039	0.728	0.039	0.721	0.032	0.719	0.028	0.714	0.029	0.714
Female	0.011	0.739	0.018	0.753	0.024	0.748	0.009	0.732	0.011	0.737	0.022	0.760
Years in current job	0.157	1.023	0.170	1.022	0.482	1.012	0.252	1.019	0.160	1.023	0.130	1.025
Years in current job, squared	0.257	1.000	0.293	1.000	0.543	1.000	0.382	1.000	0.258	1.000	0.231	0.999
Immigrated as a child	0.537	0.896	0.588	0.908	0.606	0.904	0.514	0.890	0.555	0.900	0.654	0.923
Immigrated as an adult	0.146	0.815	0.125	0.805	0.057	0.749	0.109	0.797	0.159	0.820	0.168	0.823
Children present in household	0.428	0.910	0.374	0.900	0.200	0.850	0.411	0.907	0.398	0.905	0.426	0.910
Non-working adult in household	0.310	0.874	0.384	0.891	0.583	0.924	0.292	0.869	0.310	0.874	0.326	0.878
Renter	0.009	1.388	0.011	1.380	0.077	1.269	0.011	1.377	0.010	1.387	0.015	1.361
FSA-FTN score, quartiles	0.469	0.948	0.453	0.946	0.336	0.925	0.460	0.947	0.455	0.946	0.445	0.945
Driving distance from FSA to Burrard Station	0.143	1.053	0.142	1.053	0.148	1.055	0.175	1.049	0.141	1.053	0.138	1.053
Average transit time from FSA to Burrard Station	0.333	0.992	0.363	0.993	0.335	0.992	0.425	0.994	0.343	0.993	0.342	0.992
Number of transit segments from FSA to Burrard Station	0.390	0.908	0.404	0.911	0.582	0.937	0.413	0.913	0.364	0.903	0.397	0.910
Driving distance from FSA to Burrard Station, squared	0.291	0.999	0.288	0.999	0.319	0.999	0.324	0.999	0.286	0.999	0.282	0.999
Constant	0.016	3.466	0.038	3.070	0.017	3.752	0.008	3.870	0.009	3.893	0.016	3.471
	Model summary		Model summary		Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.097	0.133	0.096	0.132	0.103	0.142	0.098	0.134	0.096	0.132	0.100	0.137

Table 96: Positive or very positive about predictability of commute from work to home (binary logistics regression 2a6)

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Subsidy level (0, 15, 25 or 50)	0.405	0.994										
Transit user (has travelled in past month)			0.625	1.089								
Has a monthly Compass Card product					0.128	1.223						
Subsidy acceptance							0.026	1.326				
Commute on transit only									0.448	0.905		
Any commuting by transit											0.007	2.549
September	0.706	0.945	0.415	0.896	0.399	0.886	0.333	0.877	0.410	0.895	0.440	0.901
Year 2019	0.983	1.004	0.567	0.926	0.990	1.002	0.346	0.880	0.491	0.912	0.532	0.919
Hotel E	0.578	0.844	0.477	0.811	0.410	0.764	0.367	0.767	0.445	0.799	0.421	0.789
Hotel A	0.385	1.294	0.664	1.114	0.984	0.995	0.887	1.036	0.586	1.144	0.649	1.119
Hotel F	0.895	0.955	0.475	0.814	0.509	0.807	0.289	0.734	0.479	0.816	0.475	0.814
Hotel B	0.604	1.146	0.896	1.032	0.627	0.879	0.854	0.956	0.788	1.068	0.875	1.039
Hotel C	0.475	0.821	0.240	0.739	0.199	0.697	0.152	0.689	0.275	0.755	0.214	0.726
Hotel D	0.136	0.607	0.004	0.493	0.001	0.420	0.002	0.465	0.004	0.497	0.004	0.492
Live downtown Vancouver (V6B, C, E, G or Z)	0.000	4.386	0.000	4.413	0.000	4.764	0.000	4.655	0.000	4.163	0.003	2.782
Lives in Zone 2	0.574	0.889	0.584	0.891	0.829	0.953	0.569	0.887	0.608	0.898	0.647	0.908
Lives in Zone 3	0.111	0.559	0.114	0.563	0.286	0.660	0.106	0.554	0.113	0.561	0.120	0.566
Works weekends	0.032	0.777	0.031	0.776	0.521	0.922	0.037	0.782	0.034	0.780	0.036	0.781
Leaves home and returns 6 a.m. to 9 p.m.	0.771	1.064	0.839	1.044	0.777	0.937	0.789	1.059	0.754	1.069	0.783	1.061
Has regular shift start and end time	0.138	1.319	0.177	1.288	0.317	1.226	0.160	1.301	0.141	1.316	0.115	1.344
Regular shift start/end and commutes 6 a.m. to 9 p.m.	0.572	1.150	0.530	1.168	0.258	1.353	0.585	1.145	0.566	1.152	0.639	1.124
Other job or jobs?	0.178	0.704	0.194	0.712	0.036	0.540	0.188	0.709	0.182	0.706	0.234	0.734
Currently attend school?	0.097	2.749	0.102	2.711	0.085	3.926	0.100	2.729	0.109	2.650	0.097	2.737
Second job in core or on transit	0.185	1.484	0.202	1.464	0.051	1.902	0.182	1.489	0.185	1.484	0.216	1.444
Has access to automobile	0.273	1.161	0.228	1.181	0.141	1.240	0.170	1.207	0.391	1.129	0.234	1.176
Housekeeping	0.004	0.523	0.005	0.532	0.004	0.514	0.003	0.514	0.005	0.529	0.005	0.530

	Model A		Model B		Model C		Model D		Model E		Model F	
	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)
Food and beverage	0.432	0.834	0.454	0.841	0.389	0.812	0.443	0.837	0.442	0.837	0.448	0.839
Guest front-serving	0.072	0.646	0.065	0.638	0.033	0.580	0.063	0.635	0.075	0.648	0.078	0.650
Back of house serving, operations	0.153	0.727	0.156	0.728	0.078	0.664	0.149	0.724	0.165	0.733	0.189	0.746
Management and admin.	0.160	0.704	0.161	0.704	0.392	0.799	0.155	0.700	0.156	0.701	0.181	0.715
School in core or on transit	0.018	0.213	0.019	0.217	0.016	0.135	0.020	0.219	0.021	0.223	0.018	0.215
No stops on commute to and from work	0.948	0.993	0.963	0.995	0.463	1.090	0.981	0.997	0.973	1.004	0.929	0.990
Do you have a valid driver's licence?	0.200	0.821	0.218	0.827	0.269	0.839	0.207	0.823	0.183	0.814	0.193	0.818
Female	0.004	0.710	0.005	0.714	0.009	0.715	0.003	0.703	0.004	0.709	0.010	0.732
Years in current job	0.014	1.040	0.014	1.041	0.138	1.026	0.034	1.035	0.015	1.040	0.011	1.042
Years in current job, squared	0.048	0.999	0.053	0.999	0.359	1.000	0.098	0.999	0.050	0.999	0.043	0.999
Immigrated as a child	0.806	0.957	0.900	0.978	0.877	1.031	0.757	0.947	0.825	0.962	0.924	0.983
Immigrated as an adult	0.477	0.905	0.477	0.905	0.227	0.833	0.376	0.883	0.516	0.913	0.531	0.915
Children present in household	0.371	0.899	0.344	0.893	0.217	0.854	0.377	0.900	0.350	0.894	0.379	0.900
Non-working adult in household	0.532	0.919	0.634	0.938	0.729	0.951	0.514	0.916	0.530	0.919	0.559	0.925
Renter	0.098	1.234	0.114	1.222	0.335	1.140	0.105	1.229	0.095	1.237	0.132	1.211
FSA-FTN score, quartiles	0.187	0.907	0.181	0.906	0.260	0.912	0.179	0.905	0.176	0.905	0.171	0.904
Driving distance from FSA to Burrard Station	0.229	1.043	0.250	1.041	0.371	1.034	0.286	1.038	0.221	1.044	0.228	1.043
Average transit time from FSA to Burrard Station	0.732	0.997	0.739	0.997	0.352	0.992	0.876	0.999	0.725	0.997	0.739	0.997
Number of transit segments from FSA to Burrard Station	0.282	0.887	0.284	0.887	0.569	0.935	0.303	0.891	0.260	0.882	0.297	0.890
Driving distance from FSA to Burrard Station, squared	0.209	0.999	0.228	0.999	0.418	0.999	0.242	0.999	0.203	0.999	0.205	0.999
Constant	0.014	3.524	0.020	3.475	0.010	4.162	0.008	3.857	0.008	3.950	0.016	3.454
	Model summary		Model summary		Model summary		Model summary		Model summary		Model summary	
	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square	Cox & Snell R-square	Nagelkerke R-square
	0.111	0.153	0.111	0.152	0.118	0.163	0.114	0.156	0.111	0.152	0.115	0.157

Table 97: Improved or unchanged general happiness with life (binary logistics regression 2b1)

	Model A: improved or unchanged general happiness with life	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.021	1.062
Change in subsidy discount percentage	0.570	0.995
Live in downtown Vancouver (V6B, C, E, G or Z)	0.208	0.313
Lives in Zone2	0.094	3.431
Lives in Zone3	0.220	4.941
Works weekends	0.073	0.529
Leaves home and returns between 6 a.m. and 9 p.m.	0.868	1.061
Has regular shift start and end time	0.688	1.172
Other job or jobs?	0.407	1.582
Currently attend school?	0.381	0.490
Housekeeping	0.634	0.725
Food and beverage	0.888	0.910
Guest front-serving	0.682	1.353
Back of house serving, operations	0.701	0.767
Management and admin.	0.405	2.030
No stops on commute to and from work	0.620	1.180
Female	0.937	0.973
Years in current job	0.854	0.991
Years in current job, squared	0.690	1.000
Immigrated as a child	0.733	0.820
Immigrated as an adult	0.139	0.490
Children present in household	0.287	0.685
Non-working adult in household	0.198	1.655
Renter	0.265	0.682
FSA-FTN score, quartiles	0.646	1.113
Driving distance from FSA to Burrard Station	0.404	0.906
Average transit time from FSA to Burrard Station	0.143	0.962
Number of transit segments from FSA to Burrard Station	0.105	1.841
Driving distance from FSA to Burrard Station, squared	0.418	1.002
Constant	0.110	11.472
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.108	0.166

Table 98: Improved or unchanged time with family and friends (binary logistics regression 2b2)

	Model A: improved or unchanged time spent with family or friends	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.060	1.046
Change in subsidy discount percentage	0.261	0.990
Live in downtown Vancouver (V6B, C, E, G or Z)	0.233	2.728
Lives in Zone 2	0.295	2.020
Lives in Zone 3	0.919	0.888
Works weekends	0.747	0.903
Leaves home and returns 6 a.m. to 9 p.m.	0.620	1.185
Has regular shift start and end time	0.866	0.934
Other job or jobs?	0.436	1.500
Currently attend school?	0.999	0.999
Housekeeping	0.576	0.685
Food and beverage	0.902	1.088
Guest front-serving	0.564	1.540
Back of house serving, operations	0.958	1.037
Management and admin.	0.974	0.975
No stops on commute to and from work	0.481	0.805
Female	0.636	0.856
Years in current job	0.801	1.012
Years in current job, squared	0.823	1.000
Immigrated as a child	0.702	0.821
Immigrated as an adult	0.113	0.501
Children present in household	0.180	1.579
Non-working adult in household	0.153	0.621
Renter	0.319	1.392
FSA-FTN score, quartiles	0.176	0.765
Driving distance from FSA to Burrard Station	0.973	0.996
Average transit time from FSA to Burrard Station	0.877	0.996
Number of transit segments from FSA to Burrard Station	0.737	1.120
Driving distance from FSA to Burrard Station, squared	0.643	1.001
Constant	0.453	2.749
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.110	0.159

Table 99: Decreased stress (binary logistics regression 2b4)

	Model A: decreased stress	
	Sig.	Exp(B)
Change to subsidy acceptance	0.000	4.454
Live in downtown Vancouver (V6B, C, E, G or Z)	0.011	12.449
Lives in Zone 2	0.231	0.426
Lives in Zone 3	0.514	0.437
Works weekends	0.419	0.758
Leaves home and returns 6 a.m. to 9 p.m.	0.104	1.800
Has regular shift start and end time	0.011	0.384
Other job or jobs?	0.674	1.248
Currently attend school?	0.823	1.189
Housekeeping	0.419	1.750
Food and beverage	0.045	3.982
Guest front-serving	0.199	2.685
Back of house serving, operations	0.124	2.986
Management and admin.	0.296	2.235
No stops on commute to and from work	0.110	1.692
Female	0.130	1.668
Years in current job	0.934	0.996
Years in current job, squared	0.337	1.001
Immigrated as a child	0.564	1.333
Immigrated as an adult	0.331	1.517
Children present in household	0.835	0.927
Non-working adult in household	0.195	0.610
Renter	0.164	0.617
FSA-FTN score, quartiles	0.919	0.978
Driving distance from FSA to Burrard Station	0.016	1.451
Average transit time from FSA to Burrard Station	0.382	1.022
Number of transit segments from FSA to Burrard Station	0.236	0.657
Driving distance from FSA to Burrard Station, squared	0.017	0.991
Constant	0.000	0.005
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square

	0.161	0.233

Table 100: Improved or unchanged predictability of commute from home to work (binary logistics regression 2b5)

	Model A: improved or unchanged predictability of commute from home to work	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.004	1.078
Change in subsidy discount percentage	0.368	0.991
Live in downtown Vancouver (V6B, C, E, G or Z)	0.473	0.542
Lives in Zone 2	0.377	1.962
Lives in Zone 3	0.055	14.454
Works weekends	0.620	0.836
Leaves home and returns 6 a.m. to 9 p.m.	0.681	1.173
Has regular shift start and end time	0.028	2.452
Other job or jobs?	0.290	0.594
Currently attend school?	0.498	0.587
Housekeeping	0.509	0.612
Food and beverage	0.902	1.094
Guest front-serving	0.162	3.176
Back of house serving, operations	0.357	2.036
Management and admin.	0.952	1.052
No stops on commute to and from work	0.518	1.259
Female	0.156	1.667
Years in current job	0.315	0.950
Years in current job, squared	0.837	1.000
Immigrated as a child	0.386	0.625
Immigrated as an adult	0.888	1.068
Children present in household	0.819	1.093
Non-working adult in household	0.467	1.355
Renter	0.842	0.932
FSA-FTN score, quartiles	0.766	1.077
Driving distance from FSA to Burrard Station	0.840	0.976
Average transit time from FSA to Burrard Station	0.469	1.021
Number of transit segments from FSA to Burrard Station	0.495	0.770
Driving distance from FSA to Burrard Station, squared	0.409	0.998
Constant	0.980	0.963
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.141	0.220

Table 101: Improved or unchanged predictability of commute back home from work (binary logistics regression 2b6)

	Model A: improved or unchanged predictability of commute from home to work	
	Sig.	Exp(B)
Wave 1 subsidy level (0, 15)	0.009	1.069
Change in subsidy discount percentage	0.167	0.987
Live in downtown Vancouver (V6B, C, E, G or Z)	0.925	0.927
Lives in Zone 2	0.567	1.519
Lives in Zone 3	0.212	5.076
Works weekends	0.405	0.753
Leaves home and returns 6 a.m. to 9 p.m.	0.143	1.690
Has regular shift start and end time	0.009	2.742
Other job or jobs?	0.667	0.805
Currently attend school?	0.706	0.745
Housekeeping	0.395	0.562
Food and beverage	0.719	1.268
Guest front-serving	0.778	1.222
Back of house serving, operations	0.393	1.816
Management and admin.	0.713	1.339
No stops on commute to and from work	0.279	0.695
Female	0.662	1.163
Years in current job	0.050	0.905
Years in current job, squared	0.143	1.002
Immigrated as a child	0.203	0.519
Immigrated as an adult	0.541	0.761
Children present in household	0.996	1.002
Non-working adult in household	0.788	1.111
Renter	0.571	0.827
FSA-FTN score, quartiles	0.913	1.026
Driving distance from FSA to Burrard Station	0.502	1.079
Average transit time from FSA to Burrard Station	0.628	1.013
Number of transit segments from FSA to Burrard Station	0.242	0.652
Driving distance from FSA to Burrard Station, squared	0.201	0.997
Constant	0.741	1.585
	Model summary	
	Cox & Snell R-square	Nagelkerke R-square
	0.147	0.221

Appendix G: TransLink data

This appendix contains supplementary aggregated data on Compass Card usage provided by TransLink. For full details on the source and the definitions used, please see Appendix C. As discussed there, Simon Fraser University and TransLink entered into a data-licensing agreement to provide the study with aggregated, non-identifiable secondary data on transit ridership for groups of hotel workers enrolled in the Compass for Organizations (CFO) program and receiving a transit subsidy, as well as a larger comparison group of people not involved in the study.

The analysis and release of this data was governed by protocols designed to ensure that the privacy of users was respected, both in spirit and with respect to the Compass Card terms of service. Aggregated data was only released when there were 35 or more monthly Compass passes receiving a subsidy at a given hotel. For this reason, the tables presented here contain data for the months of March 2018 and March 2019 for the hotels that had a 15% subsidy before the start of the study (hotels A through D) as well as Hotel F for March 2019. For context, we have also provided data for the comparison group.

Our analysis of the Compass Card data found that for the hotels that had a 15% transit subsidy before the study began (A, B, C and D), both the total number of subsidy-receiving Compass Cards and the total number of journeys increased. The pattern of change is generally as expected, especially in the context of TransLink's continued overall ridership growth.[212] In line with what we hypothesized, Table 102 shows that starting from May 2018 (i.e., when the experimental subsidies became available), more workers at the subsidy-enhanced hotels (A and D) accepted the subsidy than at the hotels where the subsidy did not increase, and the total number of transit journeys by all cards receiving a subsidy increased. There were very small increases in the number of Compass Cards and journeys at hotels (B and C) where there were no changes in the subsidy level.

Hotel A had an 112% increase in subsidy acceptance and an 89% increase in the number of transit journeys, and as expected for a subsidy increase from 15% to 25% from May 2018, most of the increase had occurred by September 2018. In comparison, the paired constant-subsidy Hotel B had a 25% increase in subsidy acceptance (although this may have been inflated by large numbers of workers returning to work in March and April 2018 at the end of their annual vacation for the Lunar New Year), and a 25% increase in total journeys.

Hotel D had an increase in subsidy acceptance of 118% and an 97% increase in total transit journeys, with about half of the increase occurring between March 2018 and September 2018, and half between September 2018 and March 2019. This is consistent with the two-step increase in subsidy, first from 15% to 25% taking effect from May 2018, and then from 25% to 50% announced in October 2018. In comparison, the paired constant-subsidy Hotel C had a 12% increase in subsidy acceptance and a 13% increase in total journeys.

[212] TransLink, "Major Ridership Growth Trend Continues through June," July 10, 2018, https://www.translink.ca/About-Us/Media/2018/July/Major-Ridership-Growth-Trend-Continues-through-June.aspx.

Table 102: Aggregated Compass Card data for hotels A through D and (selected) F

	Total cards in CFO (receiving a subsidy)					Total journeys (by cards receiving a subsidy)				
Hotel	**A**	**B**	**C**	**D**	**F**	**A**	**B**	**C**	**D**	**F**
Subsidy at March 2018	15%	15%	15%	15%	0%	15%	15%	15%	15%	0%
Subsidy from May/June 2018	25%	15%	15%	25%	25%	25%	15%	15%	25%	25%
Subsidy from November 2018	25%	15%	15%	50%	50%	25%	15%	15%	50%	50%
Jan. 2018	43	86	41	41	***n/a	1,951	4,000	1,967	1,943	n/a
Feb. 2018	43	85	41	37	n/a	1,892	3,562	1,629	1,615	n/a
Mar. 2018	42	84	43	40	n/a	2,236	3,664	1,982	1,933	n/a
Apr. 2018	52	103	38	41	n/a	2,721	4,558	1,681	1,860	n/a
May 2018	53	101	39	54	n/a	2,756	5,002	1,896	2,792	n/a
Jun. 2018	**79	101	41	**60	40	**4,020	4,644	1,841	**2,835	1,960
Jul. 2018	81	110	44	61	40	4,167	4,993	2,149	2,831	1,957
Aug. 2018	79	106	45	58	36	4,016	4,886	2,274	2,773	1,747
Sep. 2018	78	105	44	59	n/a	3,597	4,663	2,154	2,697	n/a
Oct. 2018	81	97	41	57	n/a	3,823	4,576	2,095	2,578	n/a
Nov. 2018	81	97	44	58	39	3,584	4,201	2,072	2,635	1,673
Dec. 2018	82	97	44	80	39	3,690	4,082	2,075	3,499	1,580
Jan. 2019	85	99	48	83	40	3,800	4,541	2,295	3,756	1,750
Feb. 2019	89	101	48	82	40	3,702	4,062	2,046	3,206	1,636
Mar. 2019	89	105	48	87	39	4,220	4,570	2,240	3,805	1,711
Apr. 2019	90	103	55	92	38	4,038	4,579	2,500	3,983	1,621
Percent increase										
Mar. 2018 to Sep. 2018	85.7	*25.0	2.3	47.5	n/a	60.9	27.3	8.7	39.5	n/a
Sep. 2018 to Mar. 2019	14.1	0.0	9.1	47.5	n/a	17.3	−2.0	4.0	41.1	n/a
Mar. 2018 to Mar. 2019	111.9	25.0	11.6	117.5	n/a	88.7	24.7	13.0	96.8	n/a

Source: the research and analysis are based on data provided by TransLink but the opinions expressed do not necessarily represent the views of TransLink.

* This is higher than expected, given the subsidy uptake rate reported in the surveys. This hotel reported an increase in subsidy uptake in March for April, likely due to immigrant hotel workers returning to work in March and April 2018 at the end of the annual vacation period for the Lunar New Year. This is unrelated to the study. Respondents at this hotel would have already signed up for the April subsidy when they completed the March survey. Hence, it may be appropriate to compare the percent increase from April to September, which in this case was a closer to expected 1.9%.

** Enhanced subsidies took effect at these hotels in this month.

*** In accordance with our data licensing agreement, TransLink did not provide aggregated data when fewer than 35 employees took up the subsidy. These are indicated as "n/a."

Having data on the number of Compass Cards at the study hotels that were receiving subsidies, and the number of journeys taken by those cards, allowed us to analyze the intensity of card usage. This was measured by the mean (or average) number of journeys per card per day, differentiated by origin/destination and regular/off-peak travel time. The same statistics could be calculated for the comparison group to help us understand whether any observed changes in the intensity of card usage were related to the experimental subsidies.

Table 103 presents the mean number of journeys per card per day by hotel.

Table 103: Mean journeys per card per day, for March 2018 and 2019, by hotel

	Hotels									Comparison group	
	A		B		C		D		F		
Month	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
Journeys ending downtown (regular)	0.458	0.372	0.396	0.383	0.377	0.377	0.405	0.290	0.270	0.520	0.505
Journeys ending downtown (off-peak)	0.198	0.188	0.136	0.122	0.150	0.148	0.119	0.105	0.131	0.136	0.131
Journeys starting downtown (regular)	0.245	0.236	0.267	0.286	0.281	0.290	0.302	0.233	0.189	0.387	0.378
Journeys starting downtown (off-peak)	0.355	0.274	0.238	0.190	0.218	0.186	0.186	0.187	0.239	0.252	0.244
Journeys starting and ending downtown (regular)	0.025	0.028	0.042	0.034	0.017	0.013	0.061	0.063	0.029	0.103	0.092
Journeys starting and ending downtown (off-peak)	0.012	0.013	0.015	0.011	0.027	0.020	0.016	0.026	0.010	0.056	0.050
Journeys not starting or ending downtown (regular)	0.269	0.241	0.212	0.256	0.242	0.322	0.289	0.317	0.342	0.141	0.177
Journeys not starting or ending downtown (off-peak)	0.156	0.178	0.101	0.122	0.175	0.151	0.181	0.188	0.207	0.199	0.222
Journeys ending downtown (all times)	0.656	0.560	0.533	0.505	0.527	0.525	0.523	0.395	0.400	0.656	0.636
Journeys starting downtown (all times)	0.600	0.510	0.505	0.476	0.499	0.476	0.489	0.420	0.428	0.639	0.622
Journeys starting and ending downtown (all times)	0.037	0.041	0.057	0.046	0.044	0.032	0.077	0.090	0.039	0.158	0.142
Journeys not starting or ending downtown (all times)	0.425	0.418	0.313	0.378	0.416	0.472	0.469	0.506	0.548	0.340	0.399
All journeys (regular)	0.996	0.876	0.916	0.958	0.917	1.001	1.057	0.904	0.829	1.150	1.153
All journeys (off-peak)	0.721	0.654	0.491	0.446	0.570	0.504	0.502	0.507	0.586	0.643	0.646
All journeys (all times)	1.717	1.530	1.407	1.404	1.487	1.505	1.559	1.411	1.415	1.793	1.799

Source: the research and analysis presented here are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.

Table 104 presents the same data as Table 103 but shows the mean change in journeys between March 2018 and March 2019. The 95% confidence interval of the mean change in

journeys for the comparison group indicates that the subsidy-enhanced hotels A and D experienced a significant decline in the mean number of journeys per card per day (−0.188 and −0.148, respectively, at the two hotels, compared to between −0.025 and 0.037 in the comparison group). The overall decline is driven by declines in journeys ending and starting downtown during peak hours at both hotels. At Hotel A, there was also a significant decline in journeys per card per day starting during off-peak hours, especially in those journeys that started in the downtown area. In other words, the new pass accepters used their passes less intensely than existing holders.

Table 104: Difference in mean journeys per card per day, March 2018 to 2019

	Hotel A	Hotel B	Hotel C	Hotel D	Comparison group	
	Mean difference				Mean difference	95% confidence interval
Journeys ending downtown (regular)	−0.086	−0.014	0.000	−0.115	−0.015	(−0.029 to 0)
Journeys ending downtown (off-peak)	−0.010	−0.014	−0.002	−0.014	−0.006	(−0.015 to 0.004)
Journeys starting downtown (regular)	−0.009	0.019	0.009	−0.070	−0.008	(−0.022 to 0.005)
Journeys starting downtown (off-peak)	−0.080	−0.048	−0.032	0.001	−0.008	(−0.02 to 0.004)
Journeys starting and ending downtown (regular)	0.003	−0.008	−0.005	0.002	−0.011	(−0.021 to 0)
Journeys starting and ending downtown (off-peak)	0.001	−0.004	−0.008	0.010	−0.006	(−0.014 to 0.001)
Journeys not starting or ending downtown (regular)	−0.028	0.044	0.080	0.029	0.036	(0.024 to 0.049)
Journeys not starting or ending downtown (off-peak)	0.022	0.021	−0.024	0.008	0.023	(0.007 to 0.039)
Journeys ending downtown (all times)	−0.096	−0.028	−0.002	−0.128	−0.020	(−0.034 to −0.006)
Journeys starting downtown (all times)	−0.090	−0.029	−0.023	−0.069	−0.016	(−0.031 to −0.002)
Journeys starting and ending downtown (all times)	0.004	−0.011	−0.012	0.012	−0.017	(−0.03 to −0.003)
Journeys not starting or ending downtown (all times)	−0.006	0.065	0.056	0.036	0.059	(0.039 to 0.079)
All journeys (regular)	−0.120	0.042	0.085	−0.153	0.003	(−0.026 to 0.031)
All journeys (off-peak)	−0.068	−0.045	−0.066	0.005	0.003	(−0.022 to 0.029)
All journeys (all times)	−0.188	−0.003	0.019	−0.148	0.006	(−0.025 to 0.037)

Source: the research and analysis presented here are based on data provided by TransLink but the opinions expressed do not necessarily represent the views of TransLink.

Table 105 presents the total number of journeys per month. Note that the large increases in total journeys at hotels A and D is due to the acceptance of the enhanced subsidy at these hotels. Following that, Table 106 shows the average number of journeys per month.

Table 105: Total number of journeys per month by hotel, March 2018 and 2019

	Hotels									Comparison group	
	A		B		C		D		F		
Month	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
Journeys ending downtown (regular)	596	1,027	1,032	1,245	503	561	502	783	326	161,134	156,577
Journeys ending downtown (off-peak)	258	519	355	398	200	220	147	283	158	42,201	40,486
Journeys starting downtown (regular)	319	650	694	930	374	431	375	628	228	119,814	117,203
Journeys starting downtown (off-peak)	462	757	620	618	291	277	231	505	289	78,119	75,624
Journeys starting and ending downtown (regular)	32	76	109	112	23	19	76	171	35	31,847	28,573
Journeys starting and ending downtown (off-peak)	16	37	39	37	36	29	20	71	12	17,257	15,360
Journeys not starting or ending downtown (regular)	350	664	551	832	322	479	358	856	413	43,714	54,965
Journeys not starting or ending downtown (off-peak)	203	490	264	398	233	224	224	508	250	61,690	68,776
Journeys ending downtown (all times)	854	1,546	1,387	1,643	703	781	649	1,066	484	203,335	197,063
Journeys starting downtown (all times)	781	1,407	1,314	1,548	665	708	606	1,133	517	197,933	192,827
Journeys starting and ending downtown (all times)	48	113	148	149	59	48	96	242	47	49,104	43,933
Journeys not starting or ending downtown (all times)	553	1,154	815	1,230	555	703	582	1,364	663	105,404	123,741
All journeys (regular)	1,297	2,417	2,386	3,119	1,222	1,490	1,311	2,438	1,002	356,509	357,318
All journeys (off-peak)	939	1,803	1,278	1,451	760	750	622	1,367	709	199,267	200,246
All journeys (all times)	2,236	4,220	3,664	4,570	1,982	2,240	1,933	3,805	1,711	555,776	557,564

Source: the research and analysis presented here are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.

Table 106: Average monthly journeys per card by hotel, March 2018 and March 2019

	Hotels									Comparison group	
	A		B		C		D		F		
Month	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
Journeys ending downtown (regular)	14.2	11.5	12.3	11.9	11.7	11.7	12.6	9.0	8.4	16.1	15.7
Journeys ending downtown (off-peak)	6.1	5.8	4.2	3.8	4.7	4.6	3.7	3.3	4.1	4.2	4.0
Journeys starting downtown (regular)	7.6	7.3	8.3	8.9	8.7	9.0	9.4	7.2	5.8	12.0	11.7
Journeys starting downtown (off-peak)	11.0	8.5	7.4	5.9	6.8	5.8	5.8	5.8	7.4	7.8	7.6
Journeys starting and ending downtown (regular)	0.8	0.9	1.3	1.1	0.5	0.4	1.9	2.0	0.9	3.2	2.9
Journeys starting and ending downtown (off-peak)	0.4	0.4	0.5	0.4	0.8	0.6	0.5	0.8	0.3	1.7	1.5
Journeys not starting or ending downtown (regular)	8.3	7.5	6.6	7.9	7.5	10.0	9.0	9.8	10.6	4.4	5.5
Journeys not starting or ending downtown (off-peak)	4.8	5.5	3.1	3.8	5.4	4.7	5.6	5.8	6.4	6.2	6.9
Journeys ending downtown (all times)	20.3	17.4	16.5	15.6	16.3	16.3	16.2	12.3	12.4	20.3	19.7
Journeys starting downtown (all times)	18.6	15.8	15.6	14.7	15.5	14.8	15.2	13.0	13.3	19.8	19.3
Journeys starting and ending downtown (all times)	1.1	1.3	1.8	1.4	1.4	1.0	2.4	2.8	1.2	4.9	4.4
Journeys not starting or ending downtown (all times)	13.2	13.0	9.7	11.7	12.9	14.6	14.6	15.7	17.0	10.5	12.4
All journeys (regular)	30.9	27.2	28.4	29.7	28.4	31.0	32.8	28.0	25.7	35.7	35.7
All journeys (off-peak)	22.4	20.3	15.2	13.8	17.7	15.6	15.6	15.7	18.2	19.9	20.0
All journeys (all times)	53.2	47.4	43.6	43.5	46.1	46.7	48.3	43.7	43.9	55.6	55.8

Source: the research and analysis presented here are based on data provided by TransLink but the opinions expressed do not necessarily represent the views of TransLink.

Table 107 presents the average journey distance and Table 108 the distribution of journey distance. Although there were shifts in the distribution of journey distances at the study hotels, especially relative to the very stable pattern in the comparison group, none of the changes appear salient or related to the experimental subsidy. Focusing just on average distance, analysis of the data contained in Table 107 indicates that the average journey distance at the two hotels that did not receive an enhanced subsidy (hotels B and C) increased significantly relative to the comparison group. At Hotel D, which received enhanced subsidies in two steps, the increase in average journey distance was no different from the comparison group. At Hotel A, which received a single subsidy enhancement from 15% to 25%, there was a significant decline in average journey distance. These observations suggest that the subsidy accepters may have travelled shorter distances on average, but we are reluctant to attach too much weight to this finding. This is because the average (mean) is sensitive to the inclusion of outlier values, and we found that the median

journey distance, which is not as sensitive to outliers, does not appear to be systematically related to the experimental subsidies.

Table 107: Average journey distance by hotel, March 2018 and 2019

	Hotels									Comparison group	
	A		B		C		D		F		
Month	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
Total journeys	2,236	4,220	3,664	4,570	1,982	2,240	1,933	3,805	1,711	535,296	533,632
Average distance per journey	12.83	12.5	14.03	14.49	13.35	14.17	13.95	14.26	13.73	10.86	10.87
Std. dev (per journey)	9.03	11.49	9.14	10.16	9.81	12.5	9.99	13.31	10.8	8.26	8.35
Std. error of mean (per journey)	0.19	0.18	0.15	0.15	0.22	0.26	0.23	0.22	0.26	0.01	0.01
Median per journey	10.2	10.6	11.4	11.7	10.0	9.0	10.5	10.3	9.6	8.9	8.8
Min. journey	0.5	0.2	0.5	0.2	0.5	0.0	0.6	0.2	0.0	0.5	0.5
Max. journey	57	351	48	221	68	96	68	167	50	74	75
Total distance	28,688	50,778	51,406	64,325	26,460	30,560	26,965	50,868	22,615	5,815,412	5,799,871

Source: the research and analysis presented here are based on data provided by TransLink but the opinions expressed do not necessarily represent the views of TransLink.

Table 108: Distance of journeys, distribution, by hotel, March 2018 and 2019

	Hotels %									Comparison group %	
	A		B		C		D		F		
Distance	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
0 to 5 km	21.0	19.9	14.9	15.6	18.9	21.3	20.6	19.4	19.4	26.3	26.2
5 to 10 km	26.8	25.2	24.2	20.9	31.2	35.8	24.1	26.3	31.7	31.5	31.1
10 to 15 km	20.3	29.2	26.8	28.5	19.0	9.4	20.4	23.8	16.9	19.7	20.4
15 to 20 km	8.6	7.4	4.8	7.1	5.5	6.1	8.7	8.3	4.2	7.7	7.8
20 to 25 km	5.5	4.2	10.1	7.5	5.7	7.2	9.1	5.4	10.3	5.7	5.6
25 to 30 km	13.7	10.3	14.5	14.6	13.5	12.5	10.0	9.2	8.6	6.0	5.8
30 to 35 km	3.1	3.3	3.3	3.4	2.2	1.6	2.9	2.9	4.0	1.8	1.8
35 to 40 km	1.0	0.2	0.8	1.1	3.6	2.0	3.3	2.1	0.7	0.7	0.5
40 to 45 km		0.1	0.6	0.3	0.1	0.1	0.5	1.9	2.6	0.4	0.4
45 to 50 km	0.1	0.3	0.1	0.9	0.1	3.0	0.2	0.3	1.7	0.2	0.3
50 to 55 km		0.1		0.2	0.1	0.4	0.2	0.4		0.0	0.1
55 to 60 km	0.1			0.0			0.1	0.1		0.0	0.0
60 to 65 km		0.0		0.0	0.1	0.7		0.1		0.0	0.0
65 to 70 km		0.0			0.1	0.1	0.1				0.0
70 to 75 km											0.0

Source: the research and analysis presented here are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.
Note: blank entries denote zero journeys. 0.0% denotes a frequency count of less than 0.05%.

Table 109 presents the time of the start of the journey. This data complements that presented in tables 156 and 158 in Appendix K, though readers should be aware that those tables differentiate journeys starting at home from those starting at work, and they do not

include non-work journeys. Hotel workers' journeys in the morning tended to start earlier than those of the comparison group, and at all hotels (and especially at the SkyTrain-adjacent Hotel A) the proportion of hotel workers starting a journey before 6 a.m. or after 9 p.m. was higher than for the comparison group. However, there were no discernible changes in the distribution of journey start time, suggesting that the new enrollees responding to the increased subsidy had similar journey start times as the existing enrollees.

Table 109: Time of journey start, distribution, by hotel, March 2018 and 2019

	Hotels %									Comparison group %	
	A		B		C		D		F		
Time	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2018	March 2019	March 2019	March 2018	March 2019
Midnight to 1 a.m.	3.8	2.6	1.1	0.7	2.6	2.4	1.5	1.1	0.4	1.0	0.9
1 a.m. to 2 a.m.	0.2	0.2	0.6	0.6	0.2	0.1		0.4	0.1	0.3	0.2
2 a.m. to 3 a.m.			0.1				0.2	0.6		0.1	0.1
3 a.m. to 4 a.m.			0.1					0.2		0.1	0.1
4 a.m. to 5 a.m.	2.1	1.0	0.5	0.9	0.1	0.9	0.3	0.8		0.1	0.1
5 a.m. to 6 a.m.	5.4	5.7	5.0	5.2	5.0	3.6	6.2	2.9	0.9	1.4	1.5
6 a.m. to 7 a.m.	7.8	9.3	7.9	9.4	11.8	11.1	10.9	11.7	9.0	4.2	4.4
7 a.m. to 8 a.m.	6.5	6.4	10.2	11.4	12.3	12.5	14.2	9.5	10.5	9.7	9.9
8 a.m. to 9 a.m.	5.8	4.8	6.5	6.4	3.4	5.7	3.8	5.0	6.7	11.5	11.1
9 a.m. to 10 a.m.	3.5	3.4	4.6	3.2	2.6	2.2	2.4	3.5	4.2	5.2	5.2
10 a.m. to 11 a.m.	2.8	3.4	2.9	2.8	2.3	2.0	2.0	2.4	4.0	3.1	3.1
11 a.m. to 12 p.m.	3.6	3.3	2.5	2.2	2.0	2.0	2.8	2.5	2.4	3.0	3.1
12 p.m. to 1 p.m.	3.0	2.9	3.2	3.0	3.1	4.1	3.9	3.7	4.6	3.7	3.6
1 p.m. to 2 p.m.	4.4	3.9	3.5	3.2	4.9	3.9	2.9	3.9	3.0	3.4	3.6
2 pm. to 3 p.m.	7.5	8.7	4.9	5.4	4.0	6.0	3.4	5.6	5.1	4.3	4.3
3 p.m. to 4 p.m.	9.3	8.3	6.0	7.1	5.5	4.6	8.0	7.6	3.8	6.1	6.1
4 p.m. to 5 p.m.	9.2	9.1	12.9	13.2	14.6	11.6	13.3	13.3	10.2	9.0	9.2
5 p.m. to 6 p.m.	5.9	6.7	9.4	10.7	11.4	13.7	11.0	9.8	10.9	10.6	10.7
6 p.m. to 7 p.m.	5.5	4.9	6.4	4.6	2.9	4.3	5.3	5.0	6.6	7.6	7.4
7 p.m. to 8 p.m.	2.2	2.6	3.1	3.2	1.7	1.9	2.0	2.1	4.1	4.6	4.6
8 p.m. to 9 p.m.	2.3	2.8	2.5	2.1	1.8	1.1	1.7	2.8	3.6	3.6	3.6
9 p.m. to 10 p.m.	3.2	3.1	1.9	1.9	1.6	1.9	1.4	1.7	1.9	3.2	3.3
10 p.m. to 11 p.m.	1.3	3.0	2.3	2.0	2.6	1.5	1.6	0.8	4.0	2.5	2.4
11 p.m. to midnight	4.7	4.1	2.0	1.2	3.7	3.0	1.3	2.9	4.0	1.8	1.6
Starts before 6 a.m. or after 9 p.m.	20.6	19.6	13.5	12.3	15.8	13.4	12.4	11.5	11.3	10.4	10.4

Source: the research and analysis presented here are based on data provided by TransLink, but the opinions expressed do not necessarily represent the views of TransLink.
Note: blank entries denote zero journeys. 0.0% denotes a frequency count of less than 0.05%.

Appendix H: Transit accessibility mapping

The transit accessibility mapping was done by Stefano Borgato, MUrb, an alumnus of the Simon Fraser University Urban Studies Program. In all survey waves, we asked respondents to provide the postal code of their place of residence. The first three digits of the postal code are known as the FSA (forward sortation area), and this is widely accepted as depicting neighbourhood-like geographic units within major metropolitan areas. To generate indicators of the relative ease of access from a worker's place of residence to downtown, we commissioned Borgato to develop two indicators of accessibility by FSA. The first indicator was a frequent transit network (FTN) score, which is an index of frequent transit service availability per FSA. The second was an estimate of the road distance, transit travel time and number of transit segments from the "centre" of the FSA to Burrard Station.

FTN score

The FTN score is based on the number of frequent transit stops in each 2016 FSA. An FSA was considered to contain a transit stop if the FSA's geographic boundary intersected, even partially, a circular buffer zone around the transit stop (see Figure 1). The buffer radius varied depending on the level of service available at the transit stop. According to TransLink, the distance that people are willing to walk varies with the quality of the service.[213] It is generally accepted that most people will walk up to 800 metres to access limited-stop rapid transit (SkyTrain, SeaBus, West Coast Express), up to 600 metres to access a limited-stop bus line (B-Line), and up to 400 metres to access FTN bus stops. For each transit stop, only one direction for each bus/train/ferry was considered in the count.

The FTN score is representative of an FSA's relative level of frequent transit service, weighted according to the intensity of service provided within walking distance of the centre of each FSA (see below for how the centres were determined). Faster, more frequent services such as SkyTrain are assigned a greater weight than, for example, the FTN bus service. The following multiplying coefficients were used to account for service intensity: SkyTrain 3x, SeaBus 2.5x, B-Line 1.5x, West Coast Express and FTN 0.5x.

The final FTN scores were then arrayed into quartiles (to address the highly skewed FTN scores in the downtown core versus remote suburbs) to provide an indicator of the relative level of transit service available in the respondent's home neighbourhood (FSA). The quartile indicator (1, 2, 3 or 4) was then included in a multivariate analysis alongside other accessibility indicators.

Road distance, average transit time and transit segments

We used online mapping and transit planning tools to calculate these indicators. For each of the 92 FSAs in Metro Vancouver, we required a reference point for which to calculate

[213] TransLink, "Transit-Oriented Communities Design Guidelines: Creating More Livable Places around Transit in Metro Vancouver" (TransLink, July 2012), 33, https://www.translink.ca/~/media/documents/plans_and_projects/transit_oriented_communities/transit_oriented_communities_design_guidelines.ashx.

distances and times to reach downtown. Using geographic information system software, we determined the geographic centre of each FSA. In 34 cases, we determined that the geographic centre did not correspond well to what might be taken as the "population centre of gravity." This was especially the case for larger and more sparsely populated FSAs, but also for irregularly shaped ones. For instance, we moved the reference point of the Delta FSA (V4K) westward to the Ladner community instead of leaving it on Highway 99, close to the sparsely settled Burns Bog. Shown in figures 2 and 3 as blue dots, we refer to the final reference points as the "FSA adjusted geographic centre."

It should be noted that the FSA adjusted geographic centre is not an indicator of the starting point of each worker, but rather attempts to measure the average or modal (most frequently occurring) accessibility level for residents of each FSA. For example, while a resident of V3L in New Westminster may live in a building above a SkyTrain station, other residents do not. The reference point for this FSA is the geographic centre. Hence, we estimated that residents of this FSA had a slightly longer average transit commute downtown than residents of V3T in Surrey because of the location of the FSA adjusted geographic centre relative to the SkyTrain stations in the Surrey FSA.

We estimated driving distance based on road kilometres between the FSA adjusted geographic centre and Burrard Station (see Figure 2).

We calculated transit time as the average time to travel between the adjusted geographic centre and Burrard Station for trips starting on a specific weekday (Wednesday) at 9:30 a.m. and for trips starting on a weekend day (Saturday) at 3:00 p.m. (see Figure 3). These admittedly limited observations reflect travel times somewhere between periods of highest and lowest service frequency.

We took the number of trip segments from descriptions of the type and number of transit segments that users should take to get from the FSA adjusted geographic centres to Burrard Station in the fastest way possible. The number of segments minus one gives the number of transit changes on a transit commute.

Figure 1: Transit service map

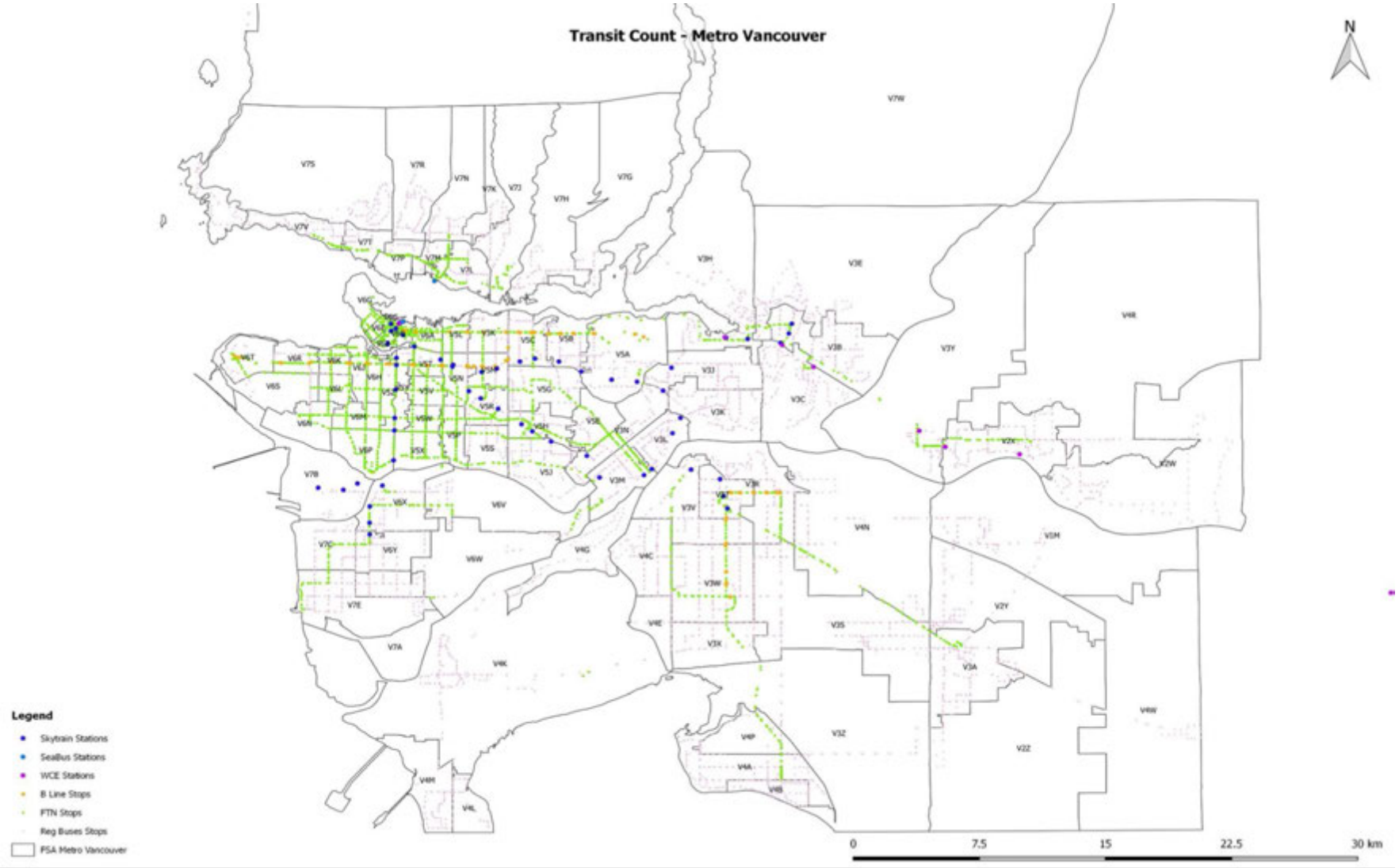


Figure 2: Driving distance to downtown Vancouver

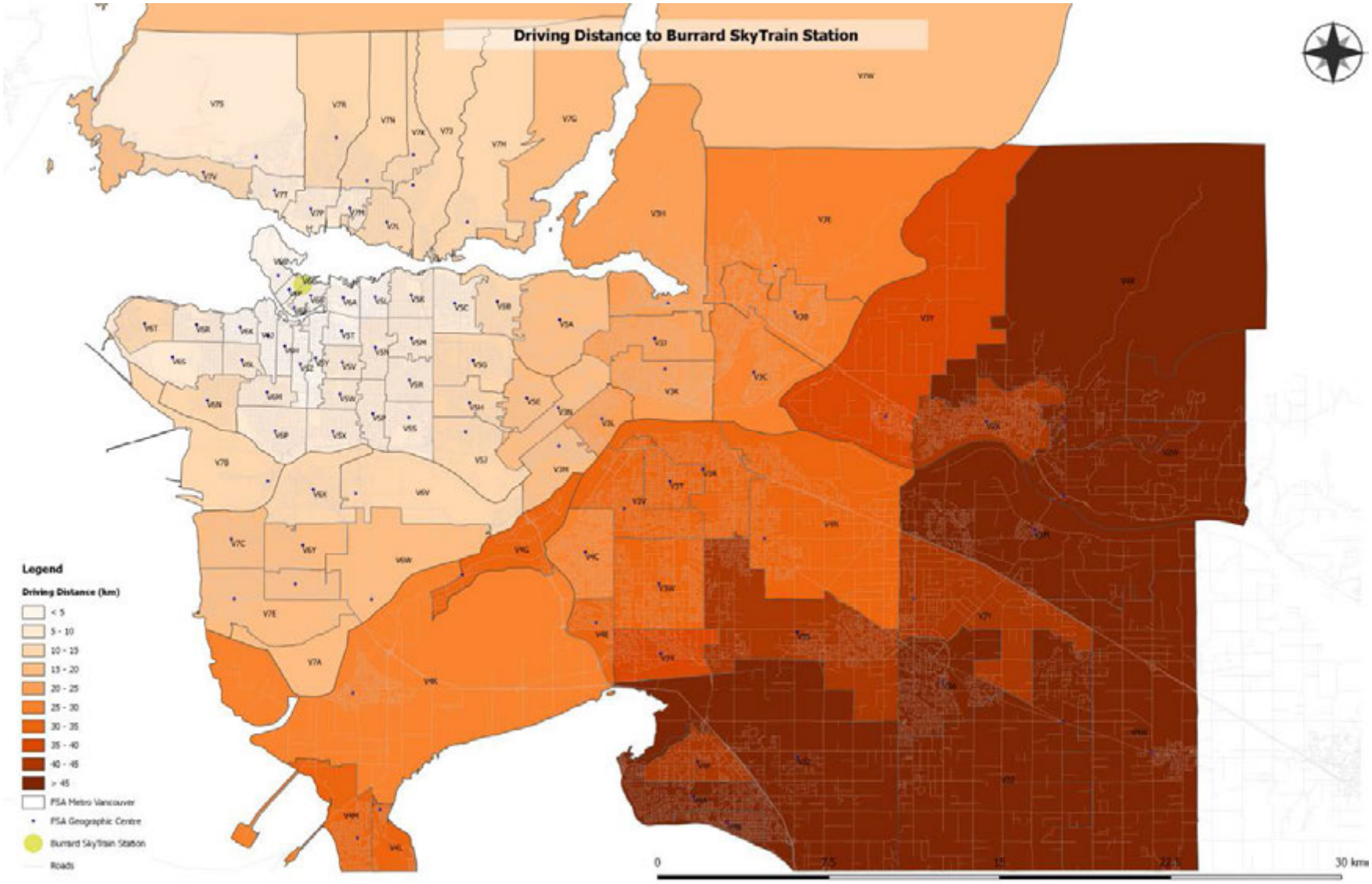
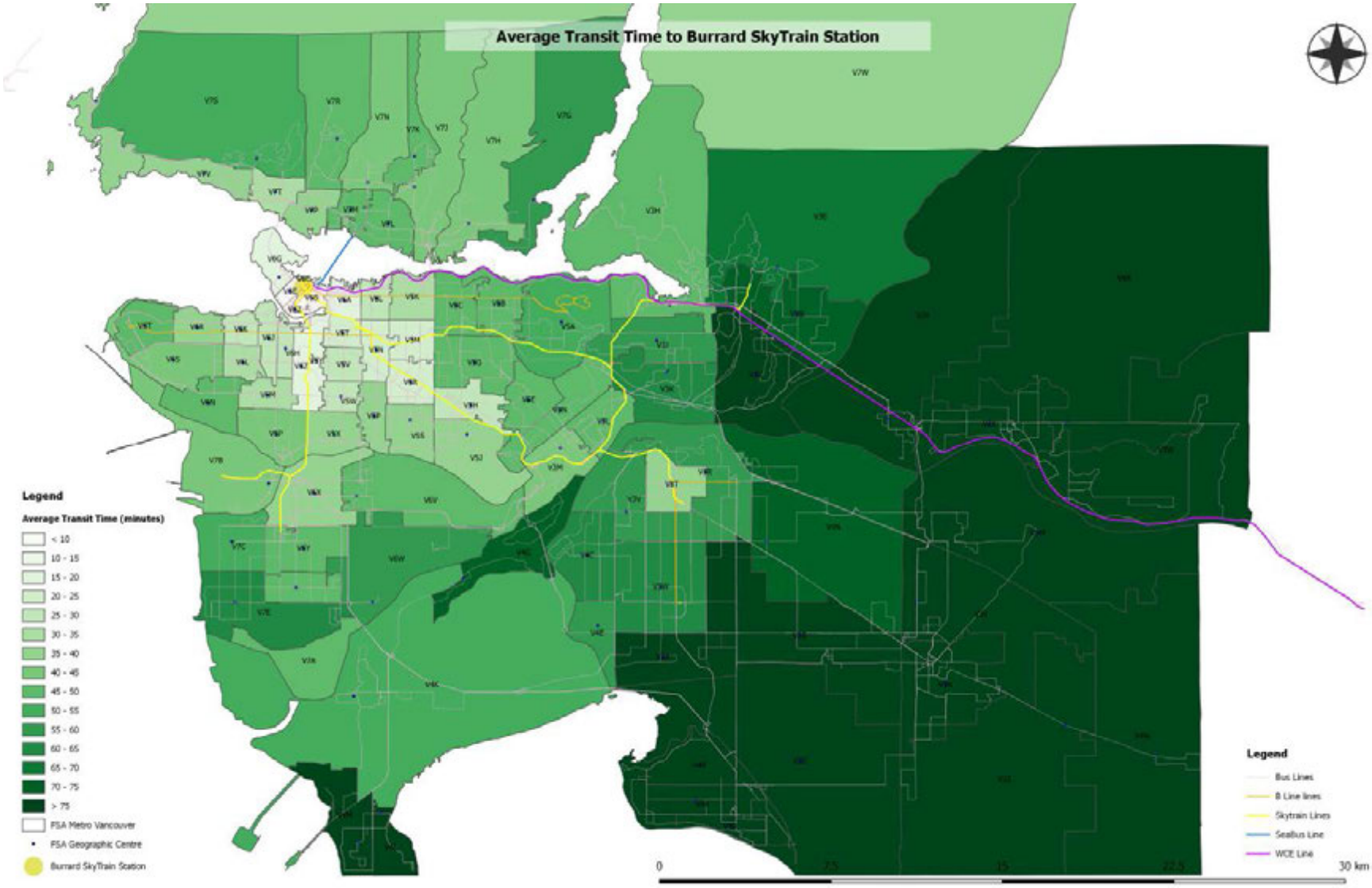


Figure 3: Average transit travel time to downtown Vancouver



Appendix I: Hotel profiles

This section of the report summarizes information we collected from the hotels, in the form of human resources indicators and through interviews with management and union representatives after each wave of the survey. For the interviews, we asked representatives about four broad areas: commute-related infrastructure, commute-related policies and practices, changes in employment policies and practices over the previous six months, and changes in the ratings of employee performance in various areas over the past six months. The human resources indicators we asked the hotels to report to us covered total employees, hiring, absenteeism, lateness, grievances and disciplinary actions. Each of the hotels had its own way of tracking these indicators and in some instances did not track them before we requested them. We therefore did not use the data to explicitly compare hotels with each other. Instead, we used this data mainly to monitor whether there were any notable changes, increases or decreases for each hotel and as the basis for further discussion during organizational interviews. We also intentionally refrained from providing any detailed hotel-specific operational information to avoid identifying individual hotels. For this reason, we have provided only rounded numbers and ranges for employment and subsidy enrolment totals. Employee figures given here are for total employees, including unionized staff, management, part-time and casual.

While we did observe some broad patterns in the hiring and absenteeism indicators, when we asked about these in organizational interviews, we found that those employment patterns were either consistent with seasonal changes in hotel demand or were connected to known operational issues. We found no cases in which the experimental subsidies were linked to union grievances or disciplinary actions by management.

More broadly, we found similarities across the hotels in several areas. For example, management at all the hotels in each wave of the survey mentioned difficulties in recruiting, especially in the departments of food and beverage services, housekeeping, engineering and maintenance, as well as night positions.

We learned that hotels provided little support for employees' commutes or for active commute modes. Some hotels provided an initial orientation to transit and the transit subsidy, but none of the hotels had formal ongoing policies or practices to ease commutes, for example by coordinating carpools. Given the nature of hospitality work, this is to some extent understandable and unavoidable. Beds can't (yet) be made remotely, and meals need to be available at standard times, so hotel management is somewhat constrained in its ability to offer customer-facing employees flexible work hours or compressed work weeks as a way of easing their commutes, at least on an employee-wide basis.

Management representatives noted that they strove to accommodate employees' commute-related limitations, within the limits of seniority provisions of collective agreements and on a case-by-case basis, although union representatives did not necessarily agree that such flexibility was universally available to them or their fellow workers.

We know that in some other employment sectors, employers may offer rewards to those who walk, bike or take transit to work. We did not find these types of incentives in general use among the study hotels. Given that many hotel employees commute long distances and work during hours when transit service is limited, offering these types of incentives might disproportionately benefit the subgroup of workers that earn the higher incomes typically required to live in the downtown core of Vancouver, rather than those who are forced to live further away due to the mismatch between their incomes and housing costs close to their workplaces.

When it comes to general hiring, training and scheduling practices, some hotels had recently increased the dollar value of incentives they offered to their employees who successfully referred potential new hires to them or refined their recruitment policies in other ways as a response to the shortage of suitable and skilled applicants. At least some of the hotels hired foreign students on work visas or other foreign workers as part of their staffing strategies, and this may have contributed to high turnover levels. Some of the hotels made minor changes to their training programs during the study period—in some cases in response to skill shortages and in others in response to directives from centralized corporate management.

Most of the hotels experienced changes in senior management while the study was in progress. It is typical in the hotel industry to see increases in general staffing levels during the summer months and to a lesser extent during the Christmas holiday season. Employees at the study hotels also have the opportunity to formally file changes to their scheduling preferences at specified times during the year, as negotiated through their collective agreements.

Common themes that emerged in interviews with union representatives were changes in duties (including due to technological change), increasing workloads and management expectations, lack of schedule flexibility, public transit service hours that didn't mesh with the demands of their work schedules, and concerns about job security, though these concerns were generally of an ongoing nature rather than specific to the survey period. However, these interviews provided us with insight into how even small changes in duties and routines, such as increases in the weight of objects repeatedly carried or the number of steps or stairs required to carry out tasks, or lack of needed supplies—could increase workers' fatigue levels. Such fatigue could in turn have influenced their choices about whether to drive, take transit, walk or cycle to work, even assuming that this full range of commute options was available to them. We also heard from several union representatives that morale was negatively affected by ongoing short-staffing and high turnover in their workplaces—mirroring the concerns about worker and skills shortages expressed by management.

A short overview of the main characteristics of each of the study hotels follows. See also Table 1: Summary of hotel characteristics and subsidy treatment on page 5.

Hotel A

This hotel offered a 15% subsidy at the outset of the study and was selected to have that subsidy increased to 25% after the first wave of the survey. The subsidy stayed at that level for the remainder of the study. The total number of employees at this hotel ranged from 460 to 480 over the study period. The number of employees enrolled in the transit subsidy program ranged from 60 to 100 over the months of May 2018 through April 2019 (when the enhanced subsidy was available). This hotel did not have any notable changes in its commute-related infrastructure or employment policies and practices in the six months preceding the study or for its duration. This hotel has change rooms and showers for employee use. It is adjacent to the SkyTrain and was paired with Hotel B.

Hotel B

This hotel offered a 15% subsidy at the outset of the study, and that remained unchanged for the duration. The total number of employees at this hotel ranged between 470 and 510 over the study period. The number of employees enrolled in the transit subsidy program ranged from 100 to 115 during the period when new or enhanced subsidies were available at other hotels. This hotel did not have any notable changes in its commute-related infrastructure or employment policies and practices in the six months preceding the study or for its duration. This hotel has both showers and change rooms for employee use. It is adjacent to the SkyTrain and was paired with Hotel A.

Hotel C

This hotel offered a 15% subsidy at the outset of the study, and the subsidy remained at that level for the duration. The total number of employees at this hotel ranged from 300 to 340 over the study period. The number of employees enrolled in the transit subsidy program ranged from 43 to 53 over the months of May 2018 through April 2019 (the period when new or enhanced subsidies were available at other hotels). This hotel did not have any notable changes in its commute-related infrastructure in the six months preceding the study or for the duration, but toward the end, this hotel informally relaxed its applicant educational requirements somewhat, in response to the ongoing skills shortage. Job descriptions were under review for part of the study period. Also, a new public bike share station became available a couple of blocks from this hotel between the second and third waves of the survey. This hotel has change rooms and showers for employee use. It is located about a five-minute walk west of the SkyTrain and was paired with Hotel D.

Hotel D

This hotel offered a 15% subsidy at the outset of the study. It was selected to have its subsidy increased to 25% after the first wave of the survey, and again to 50% after the second wave. The total number of employees at this hotel ranged from 450 to over 500 over the study period. The number of employees enrolled in the transit subsidy program ranged from 60 to 100 over the months of May 2018 to April 2019 (the period when the enhanced subsidy was available), with most of that increase coming after the second wave

survey when the subsidy was raised substantially. It did not have any major changes in its commute-related infrastructure or employment policies and practices in the six months preceding the study or for the duration, with the exception of moving to the use of a third party to pre-screen job candidates in the period preceding the first survey. Management at this hotel noted that their workforce was aging and that they were looking at ways to accommodate that, and that this could be a factor affecting employees' commuting choices, particularly for workers who live in the suburbs and are accustomed to driving to work. This hotel has change rooms and showers for employee use. This hotel is located about a 15-minute walk west of the SkyTrain and was paired with Hotel D.

Hotel E

This hotel did not offer the transit subsidy at the outset of the study but was selected to offer a 15% subsidy after the first wave of the survey. The subsidy remained at that level for the duration of the study. The total number of employees at this hotel ranged between 80 and 100 over the study period. The number of employees enrolled in the transit subsidy program ranged from 15 to 20 over the months of May 2018 to April 2019, the period when the new subsidy was available. This hotel participated in the public bike share system, though few employees took advantage of it. Beyond this, it did not have any major changes in its commute-related infrastructure or employment policies and practices in the six months preceding the study or for the duration. This hotel has change rooms for employees but not showers. It is located about a 10-minute walk west of the SkyTrain and was not paired with another hotel.

Hotel F

This hotel did not offer the transit subsidy at the outset of the study, but was selected to offer a 25% subsidy after the first wave of the survey, which was increased to 50% after the second wave. The total number of employees at this hotel ranged from 90 to 110 over the study period. The number of employees enrolled in the transit subsidy program ranged from 30 to 44 over the months of May 2018 to April 2019, the period when experimental subsidy was available. It did not have any major changes in its commute-related infrastructure or employment policies and practices in the six months preceding the study or for its duration. The hotel has change rooms and showers for employee use. This hotel is located about a 10-minute walk south of SkyTrain and was paired with Hotel G.

Hotel G

This hotel did not offer a transit subsidy at the outset of the study, and that was unchanged for the duration of the study. The total number of employees at this hotel ranged from 70 to 100 for the study period. This hotel went through a centralization of its hiring policies in the six months preceding the first wave of the survey. It also made some changes to its food and beverage services before and after the first wave. These changes eventually resulted in an expansion of food and beverage service capacity and an increase in the number of employees and available hours in this department. During the period between the first and second waves of the survey, management reported an improvement in employees' punctuality, attributing that to the launch of a points system that rewarded punctuality.

This hotel was also in the process of renovating its facilities and upgrading its quality of service over the study period. This hotel has change rooms for employee use but no showers. The hotel is located about a 10-minute walk south of the SkyTrain and was paired with Hotel F.

Appendix J: Hotel parking profiles

This appendix contains information about (1) the on-site parking arrangements at each hotel collected through organizational interviews (conducted after completion of each of the three survey waves), and (2) data on availability and price of street and lot parking, in the form of three tables for each hotel. Data for the hotel-specific parking tables was collected and analyzed by Jordan Booth in October and November 2018.

Table 110: On-site parking arrangements at each hotel

	Hotel A	Hotel B	Hotel C	Hotel D	Hotel E	Hotel F	Hotel G
Staff parking provided?	N	Y	Y	Y	N	Y	Y
Subsidized staff parking?	N	Y	Y	Y	N	Y	Y
Subsidized cost	n/a	$10/day	$146/ month	$47	n/a	$4/day & $80/ month	$120/ month
Sub. mgmt. parking?	Y	Y	Y	Y	N	Y	Y
Subsidized cost	—	$10/day	$146	$47	n/a	Free	Free
Price to public, if known	—	$20/ 6 a.m. to 6 p.m.	$225/ month	—	—	$250	$240
Owned by hotel?	N	N	N	N	Y	Y	Y
Rent to public?	N	N	N	N	Y	Y	Y
Bike parking?	Y	Y	Y	Y	N	Y	N
Carpool parking?	N	N	N	N	N	N	N
Car share parking?	N	Y	N	N	Y	N	N

Table 111: Hotel A—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	0	43
Parking spaces	59	3,359
Total spaces	59	3,402

Data collected October and November 2018

Table 112: Hotel A—parking lot summary for surrounding area

Parking lot[214]	Underground	Above ground	All-lot minimum price	All lots
Number of lots	10	1		11
Number of lots open overnight	3	1		4
Spaces per lot	3,176	183		3,359
Hourly price	$7.07	$6.35	$5.00	$7.02
Evening price, overnight rate	$9.29	$8.89	$5.00	$8.78
Daily price	$22.60	$16.00	$12.25	$22.10
Daily price, early bird	$14.94	—	$13.00	$14.94
Monthly price, anytime entry	$304.68	$220.39	$220.39	$272.00
Monthly price, day only	$244.50	—	$190.00	$244.50

Data collected October and November 2018

Table 113: Hotel A—street parking summary

Street parking[215]	Spaces/price
Car share spaces	0
Metered spaces, anytime	16
Metered spaces, non-peak	43
Free parking, daytime	0
Free parking, evening/night	0
Total street spaces	59
Hourly daytime	$6.21
Hourly evening	$5.96

Data collected October and November 2018

Table 114: Hotel B—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	3	29
Parking spaces	258	5,572
Total spaces	261	5,601

Data collected October and November 2018

[214] All prices reflect the weighted average for lot parking prices within the Hotel A area.
[215] All prices reflect the weighted average for street parking prices within the Hotel A area.

Table 115: Hotel B—parking lot summary for surrounding area

Parking lot[216]	Underground	Above ground	Under and above ground	All-lot minimum price	All lots
Number of lots	13	1	3		17
Number of lots open overnight	4	1	2		7
Spaces per lot	4,122	219	1,231		5,572
Hourly price	$7.57	$8.00	$8.81	$6.00	$7.87
Evening price, overnight rate	$8.52	$15.00	$10.00	$4.00	$9.18
Daily price	$22.94	$31.00	$28.87	$15.00	$24.60
Daily price, early bird	$15.16	$10.00	$19.62	$10.00	$16.37
Monthly price, anytime entry	$273.33	$250.00	—	$150.00	$271.51
Monthly price, day only	$221.68	—	$300.00	$175.00	$233.53

Data collected October and November 2018

Table 116: Hotel B—street parking summary

Street parking[217]	Spaces/price
Car share spaces	3
Metered spaces, anytime	126
Metered spaces, non-peak	108
Free parking, daytime	0
Free parking, evening/night	24
Total street spaces	261
Hourly daytime	$5.58
Car share spaces	$4.68

Data collected October and November 2018

Table 117: Hotel C—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	9	0
Parking spaces	304	3,619
Total spaces	313	3,619

Data collected October and November 2018

[216] All prices reflect the weighted average for lot parking prices within the Hotel B area.
[217] All prices reflect the weighted average for street parking prices within the Hotel B area.

Table 118: Hotel C—parking lot summary for surrounding area

Parking lot[218]	Underground	All-lot minimum price	All lots
Number of lots	12		12
Number of lots open overnight	7		7
Spaces per lot	3,619		3,619
Hourly price	$8.27	$5.00	$8.27
Evening price, overnight rate	$10.72	$6.00	$10.72
Daily price	$24.88	$21.00	$24.88
Daily price, early bird	$15.85	$15.00	$15.85
Monthly price, anytime entry	$279.71	$225.00	$279.71
Monthly price, day only	$297.20	$190.00	$297.21

Data collected October and November 2018

Table 119: Hotel C—street parking summary

Street parking[219]	Spaces/price
Car share spaces	9
Metered spaces, anytime	210
Metered spaces, non-peak	56
Free parking, daytime	34
Free parking, evening/night	4
Total street spaces	313
Hourly daytime	$5.57
Car share spaces	$5.08

Data collected October and November 2018

Table 120: Hotel D—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	0	4
Parking spaces	86	965
Total spaces	86	969

Data collected October and November 2018

[218] All prices reflect the weighted average for lot parking prices within the Hotel C area.
[219] All prices reflect the weighted average for street parking prices within the Hotel C area.

Table 121: Hotel D—parking lot summary for surrounding area

Parking lot[220]	Surface	Underground	All-lot minimum price	All lots
Number of lots	1	4		5
Number of lots open overnight	2	2		4
Spaces per lot	143	822		965
Hourly price	$5.00	$6.60	$4.00	$6.36
Evening price, overnight rate	$12.00	$12.00	$12.00	$4.92
Daily price	$15.00	$22.03	$15.00	$20.99
Daily price, early bird	—	$15.00	$15.00	$6.03
Monthly price, anytime entry	$100.00	$109.26	$95.00	$100.65
Monthly price, day only	—	$150.00	$150.00	$150.00

Data collected October and November 2018

Table 122: Hotel D—street parking summary

Street parking[221]	Spaces/price
Car share spaces	0
Metered spaces, anytime	86
Metered spaces, non-peak	0
Free parking, daytime	0
Free parking, evening/night	0
Total street spaces	86
Hourly daytime	$1.60
Car share spaces	$1.00

Data collected October and November 2018

Table 123: Hotel E—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	6	0
Parking spaces	250	1,161
Total spaces	256	1,161

Data collected October and November 2018

[220] All prices reflect the weighted average for lot parking prices within the Hotel D area.
[221] All prices reflect the weighted average for street parking prices within the Hotel D area.

Table 124: Hotel E—parking lot summary for surrounding area

Parking lot[222]	Underground	Above ground	Under and above ground	All-lot minimum price	All lots
Number of lots	9	1	1		11
Number of lots open overnight	3	1	1		5
Spaces per lot	1,129	19	13		1,161
Hourly price	$5.09	$4.00	$5.00	$2.00	$5.07
Evening price, overnight rate	$6.56	—	—	$6.00	$6.56
Daily price	$10.89	—	—	$6.00	$10.89
Daily price, early bird	$9.55	$10.00	$9.50	$9.50	$9.60
Monthly price, anytime entry	$190.96	$160.00	—	$118.00	$190.47
Monthly price, day only	$131.90	—	—	$110.00	$132.47

Data collected October and November 2018

Table 125: Hotel E—street parking summary

Street parking[223]	Spaces/price
Car share spaces	6
Metered spaces, anytime	186
Metered spaces, non-peak	20
Free parking, daytime	0
Free parking, evening/night	44
Total street spaces	256
Hourly daytime	$2.91
Car share spaces	$3.35

Data collected October and November 2018

Table 126: Hotel F—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	0	26
Parking spaces	297	606
Total spaces	297	632

Data collected October and November 2018

[222] All prices reflect the weighted average for lot parking prices within the Hotel E area.
[223] All prices reflect the weighted average for street parking prices within the Hotel E area.

Table 127: Hotel F—parking lot summary for surrounding area

Parking lot[224]	Surface	Underground	Under and above ground	All-lot minimum price	All lots
Number of lots	5	6	1		12
Number of lots open overnight	0	4	1		5
Spaces per lot	96	824	87		1,007
Hourly price	$4.08	$6.72	$4.00	$3.81	$6.20
Evening price, overnight rate	$11.32	$9.44	$10.00	$7.00	$9.65
Daily price	$14.38	$15.44	$13.00	$12.50	$15.12
Daily price, early bird	$10.00	$12.00	—	$10.00	$11.62
Monthly price, anytime entry	$234.71	$185.26	$150.00	$150.00	$164.47
Monthly price, day only	$280.00	$192.55	—	$190.00	$200.84

Data collected October and November 2018

Table 128: Hotel F—street parking summary

Street parking[225]	Spaces/price
Car share spaces	0
Metered spaces, anytime	168
Metered spaces, non-peak	98
Free parking, daytime	0
Free parking, evening/night	0
Total street spaces	266
Hourly daytime	$2.45
Car share spaces	$1.57

Data collected October and November 2018

Table 129: Hotel G—summary of overall parking availability in surrounding area

Parking availability	Street parking	Lot parking
Car share spaces	0	26
Parking spaces	297	606
Total spaces	297	632

Data collected October and November 2018

[224] All prices reflect the weighted average for lot parking prices within the Hotel F area.
[225] All prices reflect the weighted average for street parking prices within the Hotel F area.

Table 130: Hotel G—parking lot summary for surrounding area

Parking lot[226]	Surface	Underground	Under and above ground	All-lot minimum price	All lots
Number of lots	4	5	1		10
Number of lots open overnight	0	4	1		5
Spaces per lot	83	436	87		606
Hourly price	$4.08	$6.72	$4.00	$3.81	$5.98
Evening price, overnight rate	$11.32	$9.44	$10.00	$7.00	$12.26
Daily price	$14.38	$15.44	$13.00	$12.50	$14.65
Daily price, early bird	$10.00	$12.00	—	$10.00	$11.62
Monthly price, anytime entry	$234.71	$185.26	$150.00	$140.00	$174.31
Monthly price, day only	$280.00	$192.55	—	$280.00	$280.00

Data collected October and November 2018

Table 131: Hotel G—street parking summary

Street parking[227]	Spaces/price
Car share spaces	0
Metered spaces, anytime	181
Metered spaces, non-peak	116
Free parking, daytime	0
Free parking, evening/night	0
Total street spaces	297
Hourly daytime	$1.97
Car share spaces	$1.47

Data collected October and November 2018

[226] All prices reflect the weighted average for lot parking prices within the Hotel G area.
[227] All prices reflect the weighted average for street parking prices within the Hotel G area.

Appendix K: Frequency tables and descriptive statistics

The order of the tables here follows the order of the questions in the survey, Wave 3 version. The exception is the questions on time of departure from home to work and from work to home (questions 6a to 6e and 7a to 7e). In this appendix, we have paired those questions to make it easier to compare times and modes to and from work.

Table 132: Do you have a valid driver's licence?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	425	22.2	488	23.4	458	22.2
	Yes	1,487	77.8	1,601	76.6	1,603	77.8
	Total	1,913	100.0	2,089	100.0	2,061	100.0
Missing	System	16		14		16	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you have a valid driver's licence (including an "N" licence) to drive in Canada?

Table 133: Do you have access to an auto?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	859	46.5	985	47.3	972	47.7
	Yes	989	53.5	1,099	52.7	1,068	52.3
	Total	1,848	100.0	2,084	100.0	2,040	100.0
Missing	System	81		19		37	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you own, lease or have regular access to use the following to travel to or from work?

Table 134: Do you have access to car share?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,646	89.1	1,890	90.7	1,792	87.9
	Yes	201	10.9	194	9.3	248	12.1
	Total	1,847	100.0	2,084	100.0	2,040	100.0
Missing	System	82		19		37	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you own, lease or have regular access to use the following to travel to or from work?

Table 135: Do you have access to a motorcycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,806	97.7	2,041	97.9	2,001	98.1
	Yes	42	2.3	43	2.1	39	1.9
	Total	1,848	100.0	2,084	100.0	2,040	100.0
Missing	System	81		19		37	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you own, lease or have regular access to use the following to travel to or from work?

Table 136: Do you have access to a bicycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,576	85.3	1,742	83.6	1,761	86.3
	Yes	272	14.7	342	16.4	279	13.7
	Total	1,848	100.0	2,084	100.0	2,040	100.0
Missing	System	81		19		37	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you own, lease or have regular access to use the following to travel to or from work?

Table 137: Do not have access to an auto, motorcycle, bike or car share?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,135	61.5	1,305	62.6	1,268	62.2
	Yes	712	38.5	779	37.4	772	37.8
	Total	1,847	100.0	2,084	100.0	2,040	100.0
Missing	System	82		19		37	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you own, lease or have regular access to use the following to travel to or from work?

Table 138: Do you carpool with co-workers?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,680	94.5	1,924	95.7	1,876	94.9
	Yes	98	5.5	87	4.3	101	5.1
	Total	1,778	100.0	2,011	100.0	1,977	100.0
Missing	System	151		92		100	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you regularly carpool to or from work? With who?

Table 139: Do you carpool with others?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,692	95.0	1,941	96.5	1,906	96.4
	Yes	88	5.0	70	3.5	71	3.6
	Total	1,780	100.0	2,011	100.0	1,977	100.0
Missing	System	149		92		100	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you regularly carpool to or from work? With who?

Table 140: Do not carpool

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	177	10.0	161	8.0	168	8.5
	Yes	1,604	90.0	1,850	92.0	1,808	91.5
	Total	1,781	100.0	2,011	100.0	1,977	100.0
Missing	System	148		92		100	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you regularly carpool to or from work? With who?

Table 141: Do you currently receive a transit subsidy from your employer?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Yes, my employer offers a transit subsidy and I have taken it up	537	28.3	650	31.8	707	34.5
	My employer offers a transit subsidy but I have not taken it up	811	42.8	928	45.4	846	41.3
	No, my employer does not offer a transit subsidy	548	28.9	465	22.8	496	24.2
	Total	1,896	100.0	2,042	100.0	2,049	100.0
Missing	System	33		61		28	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you currently receive a subsidy from your employer for transit?

Table 142: Have you travelled by public transit in Metro Vancouver in the past month?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	204	10.7	270	13.0	300	14.5
	Yes	1,701	89.3	1,806	87.0	1,765	85.5
	Total	1,905	100.0	2,077	100.0	2,065	100.0
Missing	System	24		27		13	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Have you travelled by public transit in Metro Vancouver in the past month?

Table 143: Payment method? Cash or tickets

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,486	87.4	1,674	89.9	1,545	87.1
	Yes	214	12.6	187	10.1	228	12.9
	Total	1,700	100.0	1,862	100.0	1,773	100.0
Missing	System	229		242		304	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 144: Payment method? Have a Compass Card

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	167	9.8	205	11.2	150	8.5
	Yes	1,534	90.2	1,623	88.8	1,623	91.5
	Total	1,701	100.0	1,828	100.0	1,773	100.0
Missing	System	228		236		304	
Total		1,929		2,065		2,077	

Derived from method of payment for transit trips responses that include stored value or a monthly pass product.
Wave 1,2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 145: Payment method? Stored value

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,098	64.5	1,247	67.0	1,194	67.3
	Yes	604	35.5	615	33.0	579	32.7
	Total	1,701	100.0	1,862	100.0	1,773	100.0
Missing	System	228		242		304	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 146: Payment method? Autoload

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	—	—	—	—	1,464	82.5
	Yes	—	—	—	—	310	17.5
	Total	—	—	—	—	1,773	100.0
Missing	System	—	—	—	—	304	
Total		—	—	—	—	2,077	

Wave 1 and 2 question: n/a
Wave 3 question: If yes, how do you currently pay for your transit trips?

Table 147: Payment method? Have a monthly pass product

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	652	38.3	695	38.0	716	40.4
	Yes	1,049	61.7	1,133	62.0	1,057	59.6
	Total	1,701	100.0	1,828	100.0	1,773	100.0
Missing	System	228		236		304	
Total		1,929		2,065		2,077	

Derived from method of payment for transit trips responses that include a monthly pass product.
Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 148: Payment method? One-zone

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,228	72.2	1,273	68.5	1,268	71.5
	Yes	473	27.8	585	31.5	504	28.5
	Total	1,701	100.0	1,859	100.0	1,772	100.0
Missing	System	228		245		305	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 149: Payment method? Two-zone

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,349	79.3	1,544	83.1	1,436	81.0
	Yes	352	20.7	315	16.9	336	19.0
	Total	1,701	100.0	2,103	100.0	1,772	100.0
Missing	System	228		245		305	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 150: Payment method? Three-zone

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,535	90.2	1,672	89.8	1,617	91.3
	Yes	166	9.8	189	10.2	155	8.7
	Total	1,701	100.0	1,862	100.0	1,772	100.0
Missing	System	228		242		305	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 151: Payment method? Concession

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,643	96.6	1,808	97.1	1,733	97.7
	Yes	59	3.4	53	2.9	41	2.3
	Total	1,701	100.0	1,862	100.0	1,773	100.0
Missing	System	228		242		304	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 152: Payment method? West Coast Express

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,692	99.5	1,851	99.4	1,756	99.0
	Yes	9	0.5	11	0.6	18	1.0
	Total	1,701	100.0	1,862	100.0	1,773	100.0
Missing	System	228		242		304	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 153: Payment method? U-Pass

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,688	99.2	1,837	98.7	1,741	98.2
	Yes	14	0.8	25	1.3	32	1.8
	Total	1,701	100.0	1,862	100.0	1,773	100.0
Missing	System	228		242		304	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 154: Payment method?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Zone 1 Pass	462	27.1	571	30.7	485	27.4
	Zone 2 Pass	348	20.4	307	16.5	330	18.7
	Zone 3 Pass	158	9.3	186	10.0	152	8.6
	Other Pass (Conc., West Coast Express, U-Pass)	81	4.8	89	4.8	90	5.1
	Cash/Stored Value only	646	38.0	653	35.1	575	32.4
	None	6	0.4	53	2.9	140	7.9
	Total	1,701	100.0	1,859	100.0	1,772	100.0
Missing	System	228		245		305	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, how do you currently pay for your transit trips?

Table 155: Reference-to-work day (today is?)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Monday	110	5.9	96	4.6	21	1.0
	Tuesday	406	21.8	360	17.3	1,018	49.3
	Wednesday	87	4.7	442	21.3	173	8.4
	Thursday	915	49.1	599	28.8	430	20.8
	Friday	188	10.1	236	11.4	52	2.5
	Saturday	34	1.8	337	16.2	360	17.4
	Sunday	125	6.7	8	0.4	10	0.5
	Total	1,866	100.0	2,077	100.0	2,064	100.0
Missing	System	63		26		13	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Today is . . .

Table 156: To work—time left home? (by hour)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Midnight	2	0.1	2	0.1	0	0.0
	1 a.m.	0	0.0	0	0.0	2	0.1
	2 a.m.	9	0.5	9	0.4	2	0.1
	3 a.m.	11	0.6	13	0.6	18	0.9
	4 a.m.	72	3.9	44	2.2	58	2.9
	5 a.m.	238	13.0	281	13.8	273	13.6
	6 a.m.	488	26.8	517	25.4	512	25.4
	7 a.m.	349	19.2	403	19.8	415	20.7
	8 a.m.	145	7.9	126	6.2	132	6.6
	9 a.m.	91	5.0	76	3.7	65	3.2
	10 a.m.	47	2.6	59	2.9	47	2.3
	11 a.m.	29	1.6	29	1.4	44	2.2
	Noon	51	2.8	81	4.0	63	3.1
	1 p.m.	73	4.0	99	4.8	120	6.0
	2 p.m.	98	5.4	127	6.2	118	5.9
	3 p.m.	57	3.1	65	3.2	46	2.3
	4 p.m.	24	1.3	47	2.3	42	2.1
	5 p.m.	9	0.5	18	0.9	14	0.7
	6 p.m.	11	0.6	3	0.1	3	0.1
	7 p.m.	0	0.0	4	0.2	0	0.0
	8 p.m.	0	0.0	6	0.3	0	0.0
	9 p.m.	3	0.2	3	0.2	6	0.3
	10 p.m.	10	0.5	28	1.4	27	1.4
	11 p.m.	4	0.2	0	0.0	3	0.1
	Total	1,820	100.0	2,038	100.0	2,010	100.0
Missing	System	109		66		67	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What time did you leave home today to travel to work?

Table 157: To work—time arrived at work? (by hour)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Midnight	2	0.1	2	0.1	0	0.0
	2 a.m.	0	0.0	3	0.2	0	0.0
	3 a.m.	8	0.5	10	0.5	9	0.4
	4 a.m.	18	1.0	25	1.3	18	0.9
	5 a.m.	138	7.5	128	6.3	157	7.7
	6 a.m.	294	16.0	262	12.9	319	15.6
	7 a.m.	488	26.5	538	26.6	525	25.7
	8 a.m.	308	16.7	321	15.8	335	16.4
	9 a.m.	100	5.4	89	4.4	111	5.5
	10 a.m.	81	4.4	78	3.8	43	2.1
	11 a.m.	37	2.0	45	2.2	55	2.7
	Noon	39	2.1	52	2.6	28	1.4
	1 p.m.	41	2.2	72	3.6	64	3.1
	2 p.m.	95	5.2	122	6.0	167	8.2
	3 p.m.	94	5.1	136	6.7	88	4.3
	4 p.m.	56	3.0	54	2.7	50	2.5
	5 p.m.	15	0.8	42	2.1	30	1.5
	6 p.m.	0	0.0	8	0.4	3	0.1
	7 p.m.	11	0.6	1	0.1	3	0.1
	8 p.m.	0	0.0	2	0.1	0	0.0
	9 p.m.	0	0.0	0	0.0	4	0.2
	10 p.m.	9	0.5	22	1.1	11	0.5
	11 p.m.	7	0.4	11	0.6	21	1.0
	Total	1,841	100.0	2,026	100.0	2,039	100.0
Missing	System	87		78		38	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What time today did you arrive and were ready to start work at this hotel?

Table 158: Back home—time left work? (by hour)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Midnight	71	4.1	73	4.3	99	5.1
	1 a.m.	30	1.7	17	1.0	33	1.7
	2 a.m.	18	1.0	6	0.4	6	0.3
	3 a.m.	3	0.2	5	0.3	2	0.1
	4 a.m.	8	0.5	7	0.4	0	0.0
	5 a.m.	0	0.0	22	1.3	0	0.0
	6 a.m.	0	0.0	17	1.0	5	0.3
	7 a.m.	15	0.9	22	1.3	28	1.4
	8 a.m.	2	0.1	5	0.3	8	0.4
	9 a.m.	0	0.0	3	0.2	0	0.0
	10 a.m.	6	0.3	5	0.3	10	0.5
	11 a.m.	9	0.5	15	0.9	4	0.2
	Noon	37	2.2	34	2.0	21	1.1
	1 p.m.	41	2.4	30	1.8	77	4.0
	2 p.m.	124	7.2	119	7.1	140	7.2
	3 p.m.	258	14.9	172	10.2	265	13.7
	4 p.m.	422	24.4	420	24.9	431	22.2
	5 p.m.	283	16.4	270	16.1	317	16.3
	6 p.m.	81	4.7	95	5.6	97	5.0
	7 p.m.	71	4.1	60	3.6	42	2.2
	8 p.m.	22	1.2	29	1.7	46	2.4
	9 p.m.	42	2.5	53	3.1	71	3.6
	10 p.m.	89	5.1	75	4.4	76	3.9
	11 p.m.	97	5.6	129	7.7	165	8.5
	Total	1,728	100.0	1,684	100.0	1,943	100.0
Missing	System	201		419		134	
Total		1,929		2,103		2,077	

Wave 1 question: What time did you leave work the last day that you worked here?
Wave 2 and 3 question: What time did you leave work on the last day that you worked here before today?

Table 159: To home—what time arrived home? (by hour)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Midnight	88	5.1	158	8.1	167	8.4
	1 a.m.	56	3.3	56	2.9	73	3.7
	2 a.m.	30	1.7	29	1.5	26	1.3
	3 a.m.	2	0.1	5	0.3	5	0.3
	4 a.m.	3	0.2	3	0.2	0	0.0
	5 a.m.	5	0.3	9	0.5	2	0.1
	6 a.m.	4	0.2	10	0.5	5	0.3
	7 a.m.	3	0.2	24	1.2	2	0.1
	9 a.m.	0	0.0	9	0.5	22	1.1
	8 a.m.	9	0.5	3	0.2	4	0.2
	10 a.m.	3	0.2	5	0.3	4	0.2
	11 a.m.	2	0.1	5	0.3	8	0.4
	Noon	10	0.6	13	0.7	12	0.6
	1 p.m.	21	1.2	41	2.1	47	2.4
	2 p.m.	44	2.6	40	2.0	67	3.4
	3 p.m.	130	7.5	116	6.0	162	8.2
	4 p.m.	201	11.7	206	10.6	228	11.5
	5 p.m.	388	22.6	428	22.1	386	19.5
	6 p.m.	290	16.9	282	14.6	318	16.0
	7 p.m.	109	6.3	120	6.2	134	6.8
	8 p.m.	86	5.0	90	4.6	82	4.1
	9 p.m.	34	2.0	47	2.5	55	2.8
	10 p.m.	95	5.5	83	4.3	66	3.3
	11 p.m.	104	6.1	153	7.9	107	5.4
	Total	1,720	100.0	1,936	100.0	1,982	100.0
Missing	System	209		168		95	
Total		1,929		2,103		2,077	

Wave 1 question: What time did you arrive at home the last day that you worked here?
Wave 2 and 3 question: What time did you arrive home the last day that you worked here before today?

Table 160: Leaves home and returns between 6 a.m. and 9 p.m.

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	707	42.4	836	43.9	715	36.0
	Yes	962	57.6	1,066	56.1	1,271	64.0
	Total	1,669	100.0	1,902	100.0	1,986	100.0
Missing	System	260		201		91	
Total		1,929		2,103		2,077	

Wave 1 and 2 question: What time did you leave home today to travel to work? What time did you arrive home the last day that you worked here before today?
Wave 3 question: What time did you leave home today to travel to work? What time did you arrive home the last day before today that you worked here?

Table 161: Leaves work or home between 6:30 p.m. and 1 a.m.

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,228	73.6	1,567	75.6	1,443	70.6
	Yes	441	26.4	505	24.4	600	29.4
	Total	1,669	100.0	2,071	100.0	2,043	100.0
Missing	System	260		32		34	
Total		1,929		2,103		2,077	

Wave 1 and 2 question: What time did you leave home today to travel to work? What time did you arrive home the last day that you worked here before today?
Wave 3 question: What time did you leave home today to travel to work? What time did you arrive home the last day before today that you worked here?

Table 162: To home—regular shift end time?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Yes: I left at my regular shift end time	1,181	62.1	1,429	69.5	1,291	62.7
	No: my regular shift end time is earlier	183	9.6	151	7.3	118	5.7
	No: my regular shift end time is later	99	5.2	84	4.1	109	5.3
	No: I don't have a regular shift end time	439	23.1	393	19.1	542	26.3
	Total	1,902	100.0	2,056	100.0	2,061	100.0
Missing	System	27		47		16	
Total		1,929		2,103		2,077	

Wave 1 question: Is this your regular shift end time?
Wave 2 question: Was the time that you left work your regular shift end time?
Wave 3 question: Is this your regular shift end time?

Table 163: Has regular shift start and end time?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	464	24.6	498	24.3	577	28.3
	Yes	1,422	75.4	1,548	75.7	1,461	71.7
	Total	1,886	100.0	2,047	100.0	2,038	100.0
Missing	System	43		57		39	
Total		1,929		2,103		2,077	

Wave 1 and 2 question: Is this your regular shift start time? Was the time that you left work your regular shift end time?
Wave 3 question: Is this your regular shift start time? Is this your regular shift end time?

Table 164: To work—regular start time?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Yes: I arrived at my regular shift start time	1,090	57.6	1,260	60.7	1,347	65.9
	No: my regular shift start time is earlier	139	7.4	119	5.7	105	5.1
	No: my regular shift start time is later	315	16.7	282	13.6	97	4.8
	No: I don't have a regular shift start time	348	18.4	416	20.0	495	24.2
	Total	1,893	100.0	2,077	100.0	2,045	100.0
Missing	System	36		26		32	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Is this your regular shift start time?

Table 165: To work—auto modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,361	70.6	1,428	68.3	1,459	70.4
	Yes	568	29.4	662	31.7	613	29.6
	Total	1,929	100.0	2,090	100.0	2,072	100.0
Missing	System	0		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 166: To home—auto modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,306	67.7	1,437	68.4	1,448	70.2
	Yes	623	32.3	663	31.6	613	29.8
	Total	1,929	100.0	2,101	100.0	2,061	100.0
Missing	System			3		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 167: To work—TransLink modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	708	36.7	745	35.6	718	34.7
	Yes	1,221	63.3	1,345	64.4	1,354	65.3
	Total	1,929	100.0	2,090	100.0	2,072	100.0
Missing	System	0		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 168: To home—TransLink modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	732	38.0	804	38.3	743	36.1
	Yes	1,197	62.0	1,297	61.7	1,318	63.9
	Total	1,929	100.0	2,101	100.0	2,061	100.0
Missing	System			3		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 169: To work—active modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,728	89.6	1,887	90.3	1,842	88.9
	Yes	201	10.4	203	9.7	230	11.1
	Total	1,929	100.0	2,090	100.0	2,072	100.0
Missing	System	0		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 170: To home—active modes

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,746	90.5	1,892	90.0	1,829	88.8
	Yes	183	9.5	209	10.0	232	11.2
	Total	1,929	100.0	2,101	100.0	2,061	100.0
Missing	System			3		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 171: To work—auto driver?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,402	74.2	1,558	74.5	1,581	76.3
	Yes	487	25.8	534	25.5	491	23.7
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 172: To home—auto driver?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,399	73.8	1,555	75.2	1,568	76.2
	Yes	496	26.2	513	24.8	491	23.8
	Total	1,895	100.0	2,067	100.0	2,059	100.0
Missing	System	34		36		18	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 173: To work—auto passenger?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,822	96.5	1,988	95.1	1,959	94.6
	Yes	67	3.5	102	4.9	113	5.4
	Total	1,889	100.0	2,090	100.0	2,072	100.0
Missing	System	40		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 174: To home—auto passenger?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,795	94.7	1,962	94.9	1,949	94.7
	Yes	100	5.3	105	5.1	109	5.3
	Total	1,895	100.0	2,067	100.0	2,059	100.0
Missing	System	34		36		18	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 175: To work—bus?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,233	65.3	1,304	62.4	1,294	62.4
	Yes	656	34.7	786	37.6	778	37.6
	Total	1,889	100.0	2,090	100.0	2,072	100.0
Missing	System	40		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 176: To home—bus?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,291	68.1	1,328	64.2	1,348	65.4
	Yes	604	31.9	739	35.8	712	34.6
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 177: To work—SkyTrain?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	916	48.5	1,025	49.0	995	48.0
	Yes	973	51.5	1,067	51.0	1,077	52.0
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 178: To home—SkyTrain?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	920	48.5	1,053	50.9	1,016	49.3
	Yes	975	51.5	1,014	49.1	1,045	50.7
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 179: To work—West Coast Express?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,883	99.7	2,077	99.3	2,044	98.6
	Yes	6	0.3	16	0.7	28	1.4
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 180: To home—West Coast Express?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,881	99.3	2,047	99.2	2,033	98.6
	Yes	13	0.7	17	0.8	28	1.4
	Total	1,895	100.0	2,064	100.0	2,061	100.0
Missing	System	34		39		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 181: To work—SeaBus?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,876	99.3	2,082	99.5	2,058	99.3
	Yes	13	0.7	10	0.5	14	0.7
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 182: To home—SeaBus?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,874	98.9	2,053	99.3	2,040	99.0
	Yes	20	1.1	14	0.7	20	1.0
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 183: To work—walked whole way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,718	91.1	1,934	92.5	1,875	90.5
	Yes	168	8.9	158	7.5	197	9.5
	Total	1,886	100.0	2,092	100.0	2,072	100.0
Missing	System	43		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 184: To home—walked whole way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,737	91.7	1,912	92.5	1,853	89.9
	Yes	158	8.3	156	7.5	208	10.1
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 185: To work—walked part way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,733	91.8	1,870	89.4	1,859	89.7
	Yes	156	8.2	222	10.6	213	10.3
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 186: To home—walked part way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,748	92.3	1,854	89.7	1,872	90.9
	Yes	146	7.7	213	10.3	188	9.1
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 187: To work—bicycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,854	98.2	2,047	97.8	2,037	98.3
	Yes	34	1.8	46	2.2	35	1.7
	Total	1,889	100.0	2,103	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 188: To home—bicycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,870	98.7	2,014	97.4	2,036	98.8
	Yes	25	1.3	53	2.6	24	1.2
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 189: To work—taxi?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,883	99.7	2,067	98.9	2,065	99.7
	Yes	6	0.3	23	1.1	7	0.3
	Total	1,889	100.0	2,090	100.0	2,072	100.0
Missing	System	40		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 190: To home—taxi?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,875	99.0	2,032	98.3	2,052	99.6
	Yes	20	1.0	35	1.7	9	0.4
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 191: To work—motorcycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,877	99.4	2,074	99.2	2,064	99.6
	Yes	12	0.6	18	0.8	8	0.4
	Total	1,889	100.0	2,092	100.0	2,072	100.0
Missing	System	40		11		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 192: To home—motorcycle?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,878	99.1	2,049	99.1	2,053	99.6
	Yes	17	0.9	18	0.9	8	0.4
	Total	1,895	100.0	2,067	100.0	2,061	100.0
Missing	System	34		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 193: To work—mode class

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Transit-only	1,117	59.3	1,235	59.1	1,234	59.5
	Auto-only	462	24.5	552	26.4	498	24.0
	Active-only	199	10.6	186	8.9	219	10.6
	Combined modes	106	5.6	117	5.6	121	5.9
	Total	1,885	100.0	2,090	100.0	2,072	100.0
Missing	System	44		14		5	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 194: To home—mode class

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Transit only	1,079	57.3	1,198	58.0	1,217	59.1
	Auto-only	504	26.8	566	27.4	515	25.0
	Active-only	181	9.6	200	9.7	226	11.0
	Combined modes	119	6.3	102	5.0	102	4.9
	Total	1,883	100.0	2,067	100.0	2,061	100.0
Missing	System	46		36		16	
Total		1,929		2,103		2,077	

Wave 1 question: What was your method(s) of travel to home that day?
Wave 2 and 3 question: What was your method(s) of travel to home that day (the last day you worked here before today)?

Table 195: Combined to-work and home commute-mode class

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Transit-only	1,034	54.0	1,115	54.8	1,147	55.7
	Walk-only	148	7.7	135	6.6	179	8.7
	Bike-only	24	1.3	24	1.2	17	0.8
	Combined transit, walk, cycle	19	1.0	33	1.6	30	1.4
	Auto-only	431	22.5	487	24.0	445	21.6
	Auto and transit	240	12.5	224	11.0	226	11.0
	Auto and other	20	1.1	15	0.7	15	0.7
	Total	1,916	100.0	2,034	100.0	2,058	100.0
Missing	System	13		70		19	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What was your method(s) of travel to work today?

Table 196: To work—drop-off on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,728	92.5	1,899	93.5	1,899	93.7
	Yes	139	7.5	132	6.5	127	6.3
	Total	1,868	100.0	2,031	100.0	2,026	100.0
Missing	System	61		72		51	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 197: To home—drop-off on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,761	93.8	1,906	94.9	1,925	95.7
	Yes	116	6.2	102	5.1	86	4.3
	Total	1,877	100.0	2,008	100.0	2,012	100.0
Missing	System	52		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 198: To work—shopping on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,679	89.9	1,816	89.4	1,819	89.9
	Yes	189	10.1	215	10.6	204	10.1
	Total	1,868	100.0	2,031	100.0	2,023	100.0
Missing	System	61		72		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 199: To home—shopping on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,624	86.6	1,701	84.7	1,718	85.4
	Yes	252	13.4	308	15.3	294	14.6
	Total	1,877	100.0	2,008	100.0	2,012	100.0
Missing	System	52		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 200: To work—eat on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,712	91.7	1,867	91.9	1,887	93.3
	Yes	155	8.3	164	8.1	136	6.7
	Total	1,868	100.0	2,031	100.0	2,023	100.0
Missing	System	61		72		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 201: To home—eat on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,729	92.2	1,849	92.1	1,874	93.1
	Yes	146	7.8	159	7.9	138	6.9
	Total	1,875	100.0	2,008	100.0	2,012	100.0
Missing	System	54		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 202: To work—other work on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,740	93.2	1,888	93.0	1,906	94.2
	Yes	128	6.8	142	7.0	117	5.8
	Total	1,868	100.0	2,029	100.0	2,023	100.0
Missing	System	61		74		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 203: To home—other work on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,813	96.9	1,921	95.7	1,934	96.1
	Yes	59	3.1	87	4.3	78	3.9
	Total	1,872	100.0	2,008	100.0	2,012	100.0
Missing	System	57		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 204: To work—school on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,853	99.2	2,011	99.0	1,994	98.6
	Yes	14	0.8	20	1.0	29	1.4
	Total	1,868	100.0	2,031	100.0	2,023	100.0
Missing	System	61		72		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 205: To home—school on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,866	99.5	1,994	99.3	2,004	99.6
	Yes	10	0.5	15	0.7	8	0.4
	Total	1,877	100.0	2,008	100.0	2,012	100.0
Missing	System	52		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 206: To work—other on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,750	93.7	1,916	94.3	1,896	93.7
	Yes	118	6.3	115	5.7	127	6.3
	Total	1,868	100.0	2,031	100.0	2,023	100.0
Missing	System	61		72		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 207: To home—other on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,719	91.6	1,832	91.2	1,825	90.7
	Yes	158	8.4	177	8.8	187	9.3
	Total	1,877	100.0	2,008	100.0	2,012	100.0
Missing	System	52		95		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 208: To work—no stopping on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	583	31.2	652	32.1	541	26.8
	Yes	1,285	68.8	1,379	67.9	1,481	73.2
	Total	1,868	100.0	2,031	100.0	2,023	100.0
Missing	System	61		72		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: What other purpose or purposes did you have on your journey to work today?

Table 209: To home—no stopping on way?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	594	31.6	663	33.0	615	30.6
	Yes	1,283	68.4	1,344	67.0	1,397	69.4
	Total	1,877	100.0	2,006	100.0	2,012	100.0
Missing	System	52		97		65	
Total		1,929		2,103		2,077	

Wave 1 question: What other purpose or purposes did you have on your journey back home that day?
Wave 2 and 3 question: What other purpose or purposes did you have on your journey back home that day (the last day you worked before today)?

Table 210: Duration of commute to work, without stops

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Less than 15	45	3.6	53	4.0	62	4.3
	15 to 29	219	17.7	215	16.2	279	19.2
	30 to 44	372	30.1	377	28.5	490	33.8
	45 to 59	253	20.5	327	24.7	227	15.6
	60 and over	348	28.2	353	26.6	392	27.0
	Total	1,237	100.0	1,324	100.0	1,449	100.0
Missing	System	692		780		628	
Total		1,929		2,103		2,077	

Derived from question 6a: What time did you leave home today to travel to work? and question 6b: What time today did you arrive and were ready to start work at this hotel?

Table 211: Duration of commute home, without stops

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Less than 15	34	3.2	24	2.3	29	2.2
	15 to 29	122	11.5	108	10.5	211	15.7
	30 to 44	264	24.9	261	25.5	354	26.5
	45 to 59	199	18.7	213	20.8	225	16.8
	60 and over	442	41.7	418	40.8	521	38.9
	Total	1,061	100.0	1,023	100.0	1,340	100.0
Missing	System	868		1,080		737	
Total		1,929		2,103		2,077	

Derived from question 7a: What time did you leave work on the last day that you worked here before today? and question 7c: What time did you arrive home the last day that you worked here before today?

Table 212: Reference-to-work day (day last worked?)

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Monday	370	19.6	350	16.9	782	38.2
	Tuesday	186	9.9	410	19.9	138	6.7
	Wednesday	683	36.2	464	22.4	348	17.0
	Thursday	163	8.6	215	10.4	105	5.1
	Friday	167	8.9	349	16.9	309	15.1
	Saturday	179	9.5	122	5.9	138	6.7
	Sunday	139	7.3	157	7.6	225	11.0
	Total	1,887	100.0	2,067	100.0	2,044	100.0
Missing	System	42		36		33	
Total		1,929		2,103		2,077	

Wave 1 question: The last day you worked at this hotel before today was a . . .
Wave 2 and 3 question: Now we're going to switch to asking you about the last day before today that you worked at this hotel. What day of the week was that?

Table 213: Worked last Sunday?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,124	59.9	1,176	58.8	1,196	60.2
	Yes	752	40.1	824	41.2	792	39.8
	Total	1,876	100.0	2,000	100.0	1,988	100.0
Missing	System	53		103		89	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 214: Worked last Monday?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	639	34.1	839	41.9	774	38.9
	Yes	1,234	65.9	1,161	58.1	1,217	61.1
	Total	1,873	100.0	2,000	100.0	1,991	100.0
Missing	System	56		103		86	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 215: Worked last Tuesday

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	564	30.1	780	39.1	678	34.2
	Yes	1,308	69.9	1,215	60.9	1,305	65.8
	Total	1,873	100.0	1,995	100.0	1,982	100.0
Missing	System	56		109		95	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 216: Worked last Wednesday

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	535	28.6	753	37.6	644	32.5
	Yes	1,338	71.4	1,249	62.4	1,340	67.5
	Total	1,873	100.0	2,002	100.0	1,984	100.0
Missing	System	56		102		93	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 217: Worked last Thursday?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	506	27.0	741	37.1	648	32.7
	Yes	1,370	73.0	1,257	62.9	1,334	67.3
	Total	1,876	100.0	1,998	100.0	1,982	100.0
Missing	System	53		105		95	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 218: Worked last Friday?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	651	34.7	747	37.4	674	34.0
	Yes	1,222	65.3	1,252	62.6	1,308	66.0
	Total	1,873	100.0	2,000	100.0	1,982	100.0
Missing	System	56		104		95	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 219: Worked last Saturday?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,134	60.4	1,113	55.7	1,094	55.2
	Yes	742	39.6	886	44.3	887	44.8
	Total	1,876	100.0	2,000	100.0	1,981	100.0
Missing	System	53		104		96	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 220: Day of the week worked

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Weekdays only	868	46.4	871	43.5	886	44.5
	Weekends only	53	2.8	102	5.1	66	3.3
	Weekdays and weekends	948	50.7	1,030	51.4	1,037	52.2
	Total	1,869	100.0	2,003	100.0	1,989	100.0
Missing	System	60		100		88	
Total		1,929		2,103		2,077	

Wave 1 question: Thinking back over the last seven (7) days, please tick all the days you worked at this hotel.
Wave 2 and 3 question: Thinking back over the last seven (7) days before today, please tick all the days you worked at this hotel. For example, if today is Monday, please think back to last Monday.

Table 221: Year started working at this hotel

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Before 1990	254	13.8	211	10.6	253	12.6
	1990s	277	15.1	289	14.5	263	13.1
	2000s	470	25.7	471	23.7	522	26.0
	2010–2016	541	29.5	549	27.5	503	25.0
	2017	218	11.9	216	10.8	188	9.3
	2018	73	4.0	256	12.9	238	11.8
	2019	—	—	—	—	41	2.1
	Total	1,833	100.0	1,992	100.0	2,008	100.0
Missing	System	96		112		69	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: In what year did you first start working at this hotel?

Table 222: Is hotel job easy to reach on transit?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	—	—	244	12.0	198	9.8
	Yes	—	—	1,795	88.0	1,815	90.2
	Total	—	—	2,039	100.0	2,013	100.0
Missing	System	—		64		64	
Total		—		2,103		2,077	

Wave 1 question: n/a
Wave 2 and 3 question: Is your job at this hotel easy to reach on transit?

Table 223: Job class—housekeeping or room attendant

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,341	69.5	1,440	68.5	1,489	71.7
	Yes	588	30.5	663	31.5	588	28.3
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 224: Job class—food and beverage service

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,466	76.0	1,590	75.6	1,526	73.5
	Yes	463	24.0	513	24.4	551	26.5
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 225: Job class—front of house

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,719	89.1	1,817	86.4	1,806	86.9
	Yes	209	10.9	286	13.6	271	13.1
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 226: Job class—back of house/operations

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,512	78.4	1,659	78.9	1,622	78.1
	Yes	417	21.6	444	21.1	456	21.9
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 227: Job class—management and administration

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,617	83.8	1,846	87.7	1,796	86.4
	Yes	312	16.2	258	12.3	281	13.6
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 228: Job class summary

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Housekeeping	539	27.9	605	28.8	540	26.0
	Food & beverage	420	21.8	480	22.8	515	24.8
	Front of house	183	9.5	259	12.3	243	11.7
	Back of house	350	18.1	384	18.3	422	20.3
	Management and admin.	285	14.7	250	11.9	250	12.0
	Multiple/Unknown	152	7.9	124	5.9	106	5.1
	Total	1,929	100.0	2,103	100.0	2,077	100.0

Wave 1, 2 and 3 question: What is your current position/job title at this hotel?

Table 229: Do you regularly work in another job or jobs?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,516	84.1	1,665	83.1	1,679	85.3
	Yes	287	15.9	338	16.9	288	14.7
	Total	1,803	100.0	2,004	100.0	1,967	100.0
Missing	System	126		100		110	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you regularly work in another job or jobs?

Table 230: Other job 1—easy to reach on transit?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	59	23.9	55	17.8	68	24.6
	Yes	187	76.1	253	82.2	208	75.4
	Total	245	100.0	308	100.0	276	100.0
Missing	System	1,684		1,796		1,801	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 231: Other job 1—in downtown Vancouver?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	98	45.4	169	57.9	133	51.7
	Yes	118	54.6	123	42.1	125	48.3
	Total	216	100.0	292	100.0	258	100.0
Missing	System	1,713		1,811		1,819	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 232: Other job 1—number of shifts worked in last week?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	0	8	3.6	9	3.2	29	11.6
	1	22	9.7	19	6.7	44	17.6
	2	58	26.1	51	17.5	61	24.5
	3	38	16.8	53	18.3	3	1.1
	4	17	7.7	20	6.7	54	21.6
	5	78	35.0	129	44.3	21	8.5
	6	2	1.1	5	1.8	34	13.7
	7	0	0.0	3	1.1	3	1.4
	8	0	0.0	2	0.6	0	0.0
	Total	224	100.0	291	100.0	248	100.0
Missing	System	1,705		1,812		1,829	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 233: Other job 2—easy to reach on transit?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	2	4.5	5	18.0	11	31.9
	Yes	37	95.5	24	82.0	23	68.1
	Total	39	100.0	30	100.0	34	100.0
Missing	System	1,890		2,074		2,043	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 234: Other job 2—in downtown Vancouver?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	19	45.4	12	42.1	22	71.9
	Yes	22	54.6	16	57.9	9	28.1
	Total	41	100.0	27	100.0	30	100.0
Missing	System	1,888		2,076		2,047	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 235: Other job 2—number of shifts worked in last week?

		Wave 1		**Wave 2**		**Wave 3**	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	0	5	21.7	5	18.9	6	27.4
	1	6	26.2	0	0.0	6	27.8
	2	2	9.9	17	61.0	5	22.7
	3	7	29.2	2	6.0	2	9.7
	4	3	12.9	2	8.1	3	12.4
	7	0	0.0	2	6.0	0	0.0
	Total	25	100.0	27	100.0	22	100.0
Missing	System	1,904		2,076		2,055	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please provide information about the other job/jobs.

Table 236: Do you currently attend school?

		Wave 1		**Wave 2**		**Wave 3**	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,718	94.3	1,906	93.9	1,935	94.6
	Yes	104	5.7	123	6.1	110	5.4
	Total	1,822	100.0	2,029	100.0	2,044	100.0
Missing	System	107		75		33	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Do you currently attend school, college, university or some other training institution?

Table 237: School in downtown Vancouver?

		Wave 1		**Wave 2**		**Wave 3**	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	51	52.6	53	43.4	54	50.8
	Yes	46	47.4	69	56.6	53	49.2
	Total	98	100.0	122	100.0	107	100.0
Missing	System	1,831		1,982		1,970	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: If yes, do you attend school, college, university or training in downtown Vancouver?

Table 238: School is on transit?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	28	29.4	21	17.8	16	15.6
	Yes	68	70.6	96	82.2	86	84.4
	Total	96	100.0	117	100.0	102	100.0
Missing	System	1,833		1,986		1,975	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Is the school, college, university or training you attend easy to reach on transit?

Table 239: General happiness with life—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	664	36.6	708	35.5	652	33.6
	Positive	901	49.6	945	47.4	912	46.9
	Neutral	227	12.5	305	15.3	348	17.9
	Negative	21	1.2	24	1.2	20	1.0
	Very negative	2	0.1	10	0.5	10	0.5
	Total	1,816	100.0	1,993	100.0	1,943	100.0
Missing	System	113		110		134	
Total		1,929		2,065		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 240: Time spent with family and friends—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	663	37.1	680	34.1	649	33.1
	Positive	765	42.8	802	40.2	829	42.2
	Neutral	289	16.2	402	20.2	392	19.9
	Negative	49	2.7	81	4.0	81	4.1
	Very negative	22	1.2	29	1.5	13	0.7
	Total	1,788	100.0	1,994	100.0	1,964	100.0
Missing	System	141		110		113	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 241: Physical health—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	423	23.7	475	23.8	394	20.4
	Positive	896	50.2	887	44.5	915	47.4
	Neutral	371	20.8	506	25.4	531	27.5
	Negative	82	4.6	108	5.4	83	4.3
	Very negative	11	.6	16	0.8	10	0.5
	Total	1,784	100.0	1,991	100.0	1,933	100.0
Missing	System	145		112		144	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 242: Level of stress—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	145	8.3	183	9.3	179	9.4
	Positive	470	26.8	558	28.3	547	28.8
	Neutral	849	48.4	902	45.7	847	44.6
	Negative	255	14.5	276	14.0	285	15.0
	Very negative	34	1.9	56	2.8	42	2.2
	Total	1,752	100.0	1,974	100.0	1,901	100.0
Missing	System	177		129		176	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 243: Predictability of commute from home to work—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	315	17.8	365	18.4	395	20.3
	Positive	801	45.3	862	43.5	865	44.4
	Neutral	506	28.6	616	31.1	586	30.1
	Negative	112	6.3	117	5.9	79	4.1
	Very negative	37	2.1	21	1.1	22	1.1
	Total	1,771	100.0	1,981	100.0	1,947	100.0
Missing	System	158		122		130	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 244: Predictability of commute back home—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	299	16.8	363	18.3	363	18.7
	Positive	832	46.9	852	43.0	847	43.7
	Neutral	486	27.4	596	30.1	593	30.6
	Negative	120	6.7	134	6.8	113	5.8
	Very negative	37	2.1	35	1.8	23	1.2
	Total	1,773	100.0	1,980	100.0	1,938	100.0
Missing	System	156		124		139	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 245: Shift schedule—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	380	21.4	363	18.5	359	18.6
	Positive	759	42.8	837	42.6	850	44.0
	Neutral	516	29.1	607	30.9	550	28.5
	Negative	100	5.6	130	6.6	141	7.3
	Very negative	17	1.0	26	1.3	33	1.7
	Total	1,771	100.0	1,964	100.0	1,933	100.0
Missing	System	158		140		144	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 246: General happiness at work—rate

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Very positive	353	19.5	368	18.4	378	19.2
	Positive	939	51.9	945	47.1	859	43.7
	Neutral	452	25.0	603	30.0	595	30.3
	Negative	55	3.1	67	3.3	114	5.8
	Very negative	10	0.5	24	1.2	21	1.1
	Total	1,808	100.0	2,006	100.0	1,966	100.0
Missing	System	121		97		111	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Please rate the following aspects of the quality of your life on a scale from positive to negative.

Table 247: Age?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Under 25	70	3.7	84	4.1	89	4.4
	25–34	387	20.6	415	20.4	405	20.0
	35–44	376	20.0	448	22.0	434	21.4
	45–54	461	24.6	506	24.9	432	21.3
	55–64	497	26.5	493	24.2	556	27.5
	65 or older	85	4.6	87	4.3	106	5.3
	Total	1,876	100.0	2,033	100.0	2,023	100.0
Missing	System	53		71		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: How old are you?

Table 248: First language?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	English	—	—	595	31.6	538	28.9
	French	—	—	25	1.3	22	1.2
	Neither English nor French	—	—	1,266	67.1	1,300	69.9
	Total	—	—	1,886	100.0	1,860	100.0
Missing	System	—		217		217	
Total		—		2,103			

Wave 1 question: n/a
Wave 2 and 3 question: What is the language that you first learned at home in childhood and still understand?

Table 249: Gender?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Female	884	52.4	1,108	53.8	1,059	51.7
	Male	757	44.9	937	45.5	979	47.8
	Other	—	—	5	0.2	2	0.1
	Prefer not to say	—	—	8	0.4	10	0.5
	Nonbinary	45	2.7	—	—	—	—
	Total	1,686	100.0	2,058	100.0	2,050	100.0
Missing	System	243		46		27	
Total		1,929		2,103		2,077	

Wave 1 question: With which gender do you most identify?
Wave 2 and 3 question: Do you identify as . . . ?

Table 250: Born in Canada?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Yes	429	22.9	442	21.6	480	23.7
	No, I moved to Canada as a child (under 18)	256	13.7	292	14.3	294	14.5
	No, I moved to Canada as an adult (18 or older)	1,185	63.4	1,306	64.0	1,249	61.7
	Total	1,870	100.0	2,040	100.0	2,023	100.0
Missing	System	59		63		54	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Were you born in Canada?

Table 251: Visible minority?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Non-VM	435	29.3	395	21.5	413	22.5
	VM	1,040	70.1	1,435	78.2	1,414	77.2
	Aboriginal	8	0.5	5	0.3	4	0.2
	Total	1,482	100.0	1,835	100.0	1,831	100.0
Missing	System	447		268		246	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: With which ethnic background do you most identify?

Table 252: Where do you live?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Downtown Vancouver	209	11.4	205	10.5	230	11.8
	Other Vancouver incl. UBC	676	37.1	745	38.0	711	36.4
	Burnaby	252	13.8	314	16.0	318	16.3
	Surrey, White Rock, Delta	250	13.7	266	13.5	245	12.5
	Richmond	99	5.4	137	7.0	117	6.0
	New Westminster	60	3.3	66	3.4	63	3.2
	Tri-Cities (Coquitlam, Port Coquitlam, Port Moody, Anmore, Belcarra)	156	8.6	133	6.8	142	7.3
	North Shore (West Vancouver, City of North Vancouver, District of North Vancouver)	92	5.0	69	3.5	97	5.0
	Eastern (Maple Ridge, Port Moody, Langley, Abbotsford)	29	1.6	28	1.4	30	1.5
	Total	1,823	100.0	1,963	100.0	1,952	100.0
Missing	System	106		141		125	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Where do you live? Please name the suburb, neighbourhood or city: What is your postal code (e.g., V6B 5K3)?

Table 253: FSA-FTN score, quartiles

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Upper quartile	744	43.8	782	43.2	785	43.2
	Third quartile	582	34.3	642	35.4	633	34.8
	Second quartile	290	17.1	303	16.7	306	16.8
	Lower quartile	82	4.8	85	4.7	92	5.1
	Total	1,698	100.0	1,812	100.0	1,816	100.0
Missing	System	231		292		261	
Total		1,929		2,103		2,077	

Derived from place of residence questions and FTN score per FSA (first three digits of postal code).
Wave 1, 2 and 3 question: Where do you live? Please name the suburb, neighbourhood or city: What is your postal code (e.g., V6B 5K3)?

Table 254: Number of transit segments from FSA to Burrard Station

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	1 (No change)	775	45.5	799	45.0	861	47.4
	2 (One change)	745	43.8	790	44.5	756	41.6
	3 (Two changes)	172	10.1	184	10.4	193	10.7
	4 (Three changes)	9	0.6	4	0.2	6	0.3
	Total	1,701	100.0	1,778	100.0	1,816	100.0
Missing	System	228		287		261	
Total		1,929		2,065		2,077	

Derived from place of residence questions, and number of transit segments required for the estimated quickest transit trip available to travel from adjusted or geographic centre of the FSA to Burrard Station.
Wave 1, 2 and 3 question: Where do you live? Please name the suburb, neighbourhood or city: What is your postal code (e.g., V6B 5K3)?

Table 255: Household—how many people?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	1	301	17.0	341	17.6	371	18.2
	2	529	29.8	538	27.8	585	28.6
	3	384	21.7	422	21.8	439	21.5
	4	285	16.1	374	19.3	375	18.4
	5	146	8.2	119	6.1	153	7.5
	6	69	3.9	81	4.2	63	3.1
	7	37	2.1	41	2.1	21	1.0
	8	10	0.6	9	0.5	23	1.1
	9	7	0.4	6	0.3	8	0.4
	10	2	0.1	5	0.3	0	0.0
	11	2	0.1	0	0.0	3	0.1
	Total	1,772	100.0	1,937	100.0	2,041	100.0
Missing	System	157		167		36	
Total		1,929		2,103		2,077	

Wave 1 question: How many people, in addition to yourself, live as part of your household? You are the person in the first line.
Wave 2 and 3 question: How many people, including yourself, live as part of your household?

Table 256: Household—annual income?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Less than $25k	67	3.8	63	3.2	57	2.9
	$25–50k	517	29.3	570	29.2	532	27.2
	$50–75k	450	25.5	502	25.7	539	27.6
	$75–100k	308	17.4	348	17.8	308	15.8
	$100–150k	221	12.5	247	12.6	274	14.1
	$150k or more	97	5.5	71	3.7	102	5.2
	Don't know	105	6.0	152	7.8	139	7.1
	Total	1,765	100.0	1,953	100.0	1,951	100.0
Missing	System	164		151		126	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: Which of the following best describe your total household income per year (before taxes)?

Table 257: Household—tenure?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Rent	835	44.5	958	46.0	915	45.0
	Own	1,040	55.5	1,123	54.0	1,119	55.0
	Total	1,875	100.0	2,081	100.0	2,034	100.0
Missing	System	54		22		43	
Total		1,929		2,103			2,077

Wave 1, 2 and 3 question: Does your household rent or own your home?

Table 258: Household—monthly spending on housing?

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	Less than $700	90	5.0	82	4.0	98	4.9
	$700–$1,400	474	26.6	555	27.4	526	26.5
	$1,400–2,100	465	26.1	556	27.4	604	30.4
	$2,100–2,800	311	17.4	312	15.4	283	14.2
	$2,800–4,200	201	11.3	238	11.8	264	13.3
	$4,200 or more	72	4.0	91	4.5	72	3.6
	Don't know	169	9.5	191	9.4	138	7.0
	Total	1,781	100.0	2,025	100.0	1,984	100.0
Missing	System	148		78		93	
Total		1,929		2,103		2,077	

Wave 1, 2 and 3 question: How much does your household spend per month on housing where you live? This includes rent, regular mortgage payments (principal and interest), property taxes, condominium fees, as well as electricity, fuel, water and other municipal services.

Table 259: Household—spend more than one-third of income on housing

		Wave 1		Wave 2		Wave 3	
		Frequency	Valid percent	Frequency	Valid percent	Frequency	Valid percent
Valid	No	1,051	68.6	1,118	66.3	1,194	69.2
	Yes	480	31.4	568	33.7	532	30.8
	Total	1,531	100.0	1,686	100.0	1,726	100.0
Missing	System	398		418		352	
Total		1,929		2,103		2,077	

Wave 1 and 2 question: Which of the following best describe your total household income per year (before taxes)? How much does your household spend per month on housing where you live? This includes rent, regular mortgage payments (principal and interest), property taxes, condominium fees, as well as electricity, fuel, water and other municipal services.
Wave 3 question: Which of the following best describe your total household income per year (before taxes)?

Table 260: Descriptive statistics for journey duration and distance, parking, tenure, years in current job and household

	Wave 1					Wave 2					Wave 3				
	N	Min.	Max.	Mean	Std. Dev.	N	Min.	Max.	Mean	Std. Dev.	N	Min.	Max.	Mean	Std. Dev.
To work: total trip duration	1,789	1	660	49.03	40.744	1,969	5	630	51.79	51.626	2,002	3	420	47.43	35.276
To work: trip duration without stops	1,237	2	150	44.62	24.133	1,301	5	150	45.62	23.834	1,449	3	150	44.19	24.736
To home: total trip duration	1,591	0	660	72.18	76.045	1,581	2	975	73.03	94.763	1,971	3	630	59.52	49.860
To home: trip duration without stops	1,061	0	180	51.71	27.248	1,007	2	180	50.91	24.643	1,340	3	180	50.00	27.188
Daily parking	—	—	—	—	—	414	0	50	4.04	6.428	284	0.00	36.	6.61	6.699
Monthly parking	—	—	—	—	—	432	0	350	44.59	53.810	300	0.00	300	76.40	56.973
Year started working	1,833	1973	2018	2005	11.640	1,953	1973	2018	2006	11.316	2,008	1973	2019	2006	11.638
Years in current job (2018-start year)	1,833	0	45.00	12.96	11.640	1,992	0	—	11.47	11.321	2,008	0	46	12.91	11.638
Household: 0–18-year-olds	1,666	0	7	0.52	0.930	1,802	0	5	0.55	0.906	1,967	0	5	0.46	0.837
Household: working adults	1,674	1	8	2.09	1.127	1,832	1	7	2.10	1.078	1,960	1	8	2.15	1.106
Household: non-working adults	1,656	0	8	0.30	0.690	1,756	0	6	0.32	0.697	1,961	0	4	0.28	0.614
Household: total members	1,772	1	11	2.96	1.603	1,901	1	10	2.95	1.577	2,041	1	11	2.91	1.564
Driving distance from FSA to Burrard Station	1,701	1	49	14.60	11.286	1,778	1.0	59	14.48	10.924	1,816	1.00	59	14.05	10.931
Average transit time from FSA to Burrard Station	1,701	7	135	39.47	20.441	1,778	7.5	135	39.88	19.434	1,816	7.50	135	38.40	19.842
Hourly monthly wage	1,456	11.35	55	21.19	3.845	1,760	11	58	21.05	3.748	1,722	11.19	56.39	21.19	3.536

Derived from questions on the start and end times of the last trips in each direction between work and home; parking survey; questions on household composition; and derived from place of residence questions, and estimated driving distance and average duration of transit trips from the adjusted or geographic centre of the forward sortation area to Burrard Station.

Table 261: Commute stops and drop-offs, by gender, for all survey waves

Types of commute	Men %	Women %
To work, no stops on the way	69.6	71.0
To home, no stops on the way	69.2	67.4
Both directions, no stops on the way	54.7	52.1
Dropping off another person on the way	10.1	7.6

Table 262: Total duration of commutes (including stops), by gender, for all survey waves

Types of commute	Average, minutes	
	Men	Women
Commutes to work with stops	49	48
Commutes to home with stops	63	71

Table 263: Commute to work (no stops) duration in minutes by job class, all survey waves

	Wave 1 %					Wave 2 %					Wave 3 %				
Job grouping	**Under 15**	**15–29**	**30–44**	**45–59**	**60+**	**Under 15**	**15–29**	**30–44**	**45–59**	**60+**	**Under 15**	**15–29**	**30–44**	**45–59**	**60+**
Housekeepers	—	6.5	30.6	24.4	38.5	1.4	12.2	30.0	24.1	32.4	0.6	10.0	32.3	18.4	38.7
Food and beverage	4.0	24.9	35.7	17.7	17.7	5.5	13.7	32.8	29.7	18.4	5.9	20.5	41.5	13.6	18.4
Front of house	5.5	28.3	28.3	18.9	18.9	3.8	21.2	35.9	19.6	19.6	4.9	25.1	38.8	15.3	15.8
Back of house	2.2	12.4	32.3	18.1	35	3.0	14.9	17.4	31.1	33.6	1.4	17.3	31.5	16.3	33.6
Management and admin.	9.6	27.8	20.7	21.7	20.2	10.2	25.6	25.6	14.8	23.9	10.9	35.2	25.9	11.4	16.6
Multiple/unknown	4.2	15.8	29.5	18.9	31.6	—	14.9	26.9	25.4	32.8	6.1	9.8	25.6	20.7	37.8
All	**3.6**	**17.7**	**30.0**	**20.5**	**28.2**	**4.0**	**16.2**	**28.5**	**24.8**	**26.6**	**4.2**	**19.2**	**33.9**	**15.7**	**27.1**

Table 264: Change to transit-only commuting by region, waves 1 to 3

Sub region	Change in transit-only %			
	Less	Same	More	Total
Downtown Vancouver	11.8	85.3	2.9	100.0
Other Vancouver incl. UBC	7.1	83.8	9.1	100.0
Burnaby	4.4	85.3	10.3	100.0
Surrey, White Rock, Delta	5.7	90.6	3.8	100.0
Richmond	8.0	76.0	16.0	100.0
New Westminster	7.1	92.9	—	100.0
Tri-Cities (Coquitlam, Port Coquitlam, Port Moody, Anmore, Belcarra)	2.6	87.2	10.3	100.0
North Shore (West Vancouver, City of North Vancouver, District of North Vancouver)	9.5	85.7	4.8	100.0
Eastern (Maple Ridge, Port Moody, Langley, Abbotsford)	—	100.0	—	100.0
All	**6.5**	**85.5**	**8.0**	**100.0**

Table 265: Change to transit-only commuting by year started job, waves 1 to 3

Year started job	Change in transit-only %			
	Less	Same	More	Total
Before 1990	8.3	87.5	4.2	100.0
1990s	4.8	88.7	6.5	100.0
2000s	5.5	82.7	11.8	100.0
2010–2016	9.6	82.5	7.9	100.0
2017	4.4	93.3	2.2	100.0
2018	—	77.8	22.2	100.0
All	**6.7**	**85.3**	**7.9**	**100.0**

Table 266: Change to transit-only commuting by visible minorities, waves 1 to 3

	Change in transit-only %			
	Less	Same	More	Total %
Visible minority	6.2	84.0	9.8	100.0
Not a visible minority	8.9	87.8	3.3	100.0
All	**6.8**	**84.8**	**8.3**	**100.0**

Table 267: Change to transit-only commuting for households that included non-working adults

Type of household	Change in transit-only %			
	Less	Same	More	Total %
Without non-working adults	6.4	87.3	6.4	100.0
With non-working households	7.1	79.6	13.3	100.0
All	**6.5**	**85.6**	**7.9**	**100.0**

Table 268: Change to transit-only commuting by job class, waves 1 to 3

Job class	Change in transit-only %			
	Less	Same	More	Total %
Housekeepers	5.1	83.1	11.8	100.0
Food and beverage	6.6	84.2	9.2	100.0
Front of house	8.9	82.2	8.9	100.0
Back of house	3.1	93.8	3.1	100.0
Management and admin.	14.1	82.8	3.1	100.0
Multiple/unknown	3.8	84.6	11.5	100.0
All	**6.5**	**85.6**	**7.9**	**100.0**

Table 269: Change to transit-only commuting by gender, waves 1 to 3

Gender	Change in transit-only %			
	Less	Same	More	Total %
Female	5.9	85.2	8.9	100.0
Male	7.5	86.0	6.5	100.0
All	6.5	85.6	7.9	100.0

Note: total includes female, male, and nonbinary responses and non-responses.

Table 270: Percentage of respondents who had Compass Cards and monthly Compass products by job class, Wave 1

Job class	Has a Compass Card %		Total %	Has a monthly Compass product %		Total %
	No	Yes		No	Yes	
Housekeeping	4.0	96.0	100.0	23.3	76.7	100.0
Food & beverage service	14.1	85.9	100.0	51.1	48.9	100.0
Front of house	15.9	84.1	100.0	42.9	57.1	100.0
Back of house	10.0	90.0	100.0	37.2	62.8	100.0
Management and admin.	11.3	88.7	100.0	52.8	47.2	100.0
Multiple/unknown	9.2%	90.8	100.0	30.5	69.5	100.0
All	**9.8%**	**90.2**	**100.0**	**38.3**	**61.7**	**100.0**

Table 271: Region of residence by job class, wave 1

Job class	Subregion									
	DT CoV %	Other CoV incl. UBC %	Bby. %	Surrey, White Rock, Delta %	Rich. %	New West. %	Tri-Cities %	N. Shore %	East. %	Total %
Housekeeping	3.0	42.1	15.8	19.6	4.5	4.3	8.9	0.8	1.0	100.0
Food & beverage	19.6	36.4	12.3	7.8	6.8	3.3	7.3	4.5	2.0	100.0
Front of house	18.9	37.1	8.6	5.7	6.9	6.3	10.3	2.9	3.4	100.0
Back of house	6.5	37.8	15.5	20.8	3.6	3.0	6.8	3.6	2.4	100.0
Management & admin.	18.4	23.9	12.9	7.0	8.5	0.7	11.0	17.6		100.0
Multiple/ unknown	7.4	45.9	14.8	14.8	1.5	1.5	8.9	3.7	1.5	100.0
All	**11.4**	**37.2**	**13.8**	**13.7**	**5.4**	**3.3**	**8.6**	**5.0**	**1.6**	**100.0**

Table 272: Region of residence by job class, wave 2

Job class	Subregion									
	DT CoV %	Other CoV incl. UBC %	Bby. %	Surrey, White Rock, Delta %	Rich. %	New West. %	Tri-Cities %	N. Shore %	East %	Total %
Housekeeping	3.7	42.3	20.1	18.7	4.6	3.1	5.3	1.8	0.4	100.0
Food & beverage	9.1	39.1	15.8	10.4	8.4	4.1	6.7	5.0	1.5	100.0
Front of house	16.3	42.6	8.8	11.2	7.2	2.4	6.4	2.8	2.4	100.0
Back of house	8.3	34.3	18.0	14.6	8.0	4.1	10.5	1.7	0.6	100.0
Management & admin.	21.0	31.3	14.6	9.4	6.4	2.1	5.6	9.4		100.0
Multiple/ unknown	21.8	27.3	9.1	11.8	10.0	3.6	7.3		9.1	100.0
All	**10.5**	**38.0**	**16.0**	**13.5**	**7.0**	**3.4**	**6.9**	**3.5**	**1.4**	**100.0**

Table 273: Region of residence by job class, wave 3

Job class	Subregion									
	DT CoV %	Other CoV incl. UBC %	Bby. %	Surrey, White Rock, Delta %	Rich. %	New West. %	Tri-Cities %	N, Shore %	East %	Total %
Housekeeping	3.8	41.9	19.0	16.1	5.4	3.4	7.5	2.6	0.4	100.0
Food & beverage	14.1	36.1	19.3	8.2	6.0	2.2	6.2	6.0	1.8	100.0
Front of house	17.0	39.6	6.5	11.7	9.6	4.8	8.3	2.2	0.4	100.0
Back of house	8.6	36.1	16.7	15.4	7.3	2.5	8.3	3.3	1.8	100.0
Management & admin.	24.0	23.6	12.4	7.1	3.6	2.7	8.4	15.6	2.7	100.0
Multiple/ unknown	13.9	32.7	17.8	18.8	1.0	7.9	3.0		5.0	100.0
All	**11.8**	**36.4**	**16.3**	**12.5**	**6.0**	**3.2**	**7.3**	**4.9**	**1.5**	**100.0**

Table 274: Born in Canada by job class, waves 1, 2 and 3

Job class	Born in Canada								
	Wave 1			Wave 2			Wave 3		
	Yes %	No, I moved to Canada as a child (under 18) %	No, I moved to Canada as an adult (18 or older) %	Yes %	No, I moved to Canada as a child (under 18) %	No, I moved to Canada as an adult (18 or older) %	Yes %	No, I moved to Canada as a child (under 18) %	No, I moved to Canada as an adult (18 or older) %
Housekeeping	4.5	6.6	88.9	3.0	5.6	91.5	3.3	9.8	86.9
Food & beverage	30.0	13.9	56.0	28.3	13.1	58.6	28.0	13.0	59.0
Front of house	37.5	16.5	46.0	30.9	18.9	50.2	34.0	21.2	44.8
Back of house	16.0	19.5	64.4	20.2	26.7	53.1	20.8	18.6	60.6
Management & admin.	47.9	16.9	35.2	44.0	18.1	37.9	47.8	16.6	35.6
Multiple/ unknown	17.4	14.5	68.1	23.9	5.1	70.9	37.8	8.2	54.1
All	**22.9**	**13.7**	**63.4**	**21.7**	**14.3**	**64.0**	**23.8**	**14.5**	**61.7**

Table 275: Household tenure by job class, waves 1, 2 and 3

Job class		Household: tenure					
		Wave 1		Wave 2		Wave 3	
		Rent %	Own %	Rent %	Own %	Rent %	Own %
	Housekeeping	37.2	62.8	47.0	53.0	42.6	57.4
	Food & beverage	56.3	43.7	47.3	52.7	47.5	52.5
	Front of house	47.5	52.5	48.6	51.4	50.4	49.6
	Back of house	37.9	62.1	40.1	59.9	40.3	59.7
	Management & admin.	42.3	57.7	41.9	58.1	46.3	53.7
	Multiple/ unknown	54.5	45.5	57.4	42.6	47.5	52.5
All		**44.5**	**55.5**	**46.0**	**54.0**	**45.0**	**55.0**

Table 276: Transit user (has travelled in past month) by job class, wave 1

Job class		Transit user (has travelled in past month)		
		No %	Yes %	All %
	Housekeeping	5.9	94.1	100.0
	Food & beverage	16.9	83.1	100.0
	Front of house	7.6	92.4	100.0
	Back of house	12.4	87.6	100.0
	Management & admin.	12.1	87.9	100.0
	Multiple/ Unknown	7.3	92.7	100.0
All		**10.7**	**89.3**	**100.0**

Table 277: Change in any use of transit in commute by subregion, waves 1 to 3

Job class		Change: any_transit			
		Less %	Same %	More %	Total %
	Downtown Vancouver	14.7	73.5	11.8	100.0
	Other Vancouver incl. UBC	5.8	88.3	5.8	100.0
	Burnaby		95.6	4.4	100.0
	Surrey, White Rock, Delta		100.0		100.0
	Richmond	12.0	84.0	4.0	100.0
	New Westminster		100.0		100.0
	Tri-Cities (Coquitlam, Port Coquitlam, Port Moody, Anmore, Belcarra)		94.9	5.1	100.0
	North Shore (West Vancouver, City of North Vancouver, District of North Vancouver)		95.2	4.8	100.0
	Eastern (Maple Ridge, Port Moody, Langley, Abbotsford)		80.0	20.0	100.0
All		**4.1**	**90.8**	**5.1**	**100.0**

Table 278: Change in transit commute mode, 1996 to 2016

	City of Vancouver			Vancouver CMA/Greater Vancouver Regional District		
	1996 %	2016 %	Mode Shift Change %	1996 %	2016 %	Mode Shift Change %
Car; truck; van—as a driver	55.1	45.4	−9.7	70.6	64.3	−6.3
Car; truck; van—as a passenger	6.1	3.6	−2.5	6.6	5.0	−1.5
Public transit	23.7	29.7	6.0	14.3	20.4	6.0
Walked or bicycled	13.9	19.8	5.9	7.5	9.1	1.6
Other method	1.2	1.4	0.2	1.0	1.2	0.3

Source: Statistics Canada, Census of Population Community Profiles, 1996 and 2016.

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