

**How do social housing locations impact  
transit use in family households in the cities of  
Vancouver and Burnaby?**

**by**

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B.E.S., University of Waterloo, 2007

Project Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Urban Studies

in the

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## **Abstract**

This study aims to explain how low-income families in Vancouver and Burnaby accommodate their transportation costs and transportation option(s) with limited financial resources. To answer the above question, a total of four social housing sites in Vancouver and Burnaby were selected for further study. Two sites with poor bus access were selected and two sites with good bus access were selected. Within those 4 sites, 12 families were interviewed. This study explores how low-income families choose their transportation mode(s) given their limited incomes and social housing locations. The findings indicate that the built environment, work and non-work destinations, public transit accessibility and frequency; and, family structure influence a household's travel behaviours. The findings in this study warrant further research with regards to parking at social housing sites and the transportation behaviours of all social housing residents.

**Keywords:** Social housing; public transportation; bus; family; Vancouver; Burnaby; Lower Mainland

## **Dedication**

I dedicate this thesis to the individuals in the housing sector.

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## Definitions

<b>Affordability</b>	Housing professionals advocate a household spend no more than 30% of their income on housing (Canada Mortgage and Housing Corporation, 2012a).
<b>Captive Riders</b>	Persons who must use public transportation to travel and do not have access to private transportation (Transportation Research Board, 2012).
<b>Choice Riders</b>	Persons who can afford private transportation but choose to use public transportation (Twin Cities TOD, 2012).
<b>Core Housing Need</b>	A household that is living in housing that is inadequate, unsuitable or unaffordable and cannot access adequate, suitable or affordable housing without spending more than 30% of their income before tax on housing (Human Resources and Skills Development Canada, 2012a).
<b>Family</b>	A married couple and the children; or, a couple living common-law and the children, or, a lone parent of any marital status with at least one child living in the same dwelling (Statistics Canada, 2006a).
<b>Frequent Transit Network</b>	A pathway where public transit service runs at least every 15 minutes at all times of the day, every day (TransLink, 2012d).
<b>Economic immigrants</b>	Person selected for their skills and ability to contribute to Canada's economy, including skilled workers, business people and provincial nominees (Citizenship and Immigration Canada, 2011).
<b>Government Transfers</b>	Income that came from government transfers (Canada Pension Plan, Unemployment Insurance, Guaranteed Income Supplement, Spouse's Allowance, Child Tax Benefits, workers' compensation benefits, and other payments) (Statistics Canada, 2011).
<b>Housing and Transportation Affordability Index</b>	When a household spends less than 20% of their income on transportation and no more than 45% of their income on transportation and housing combined (Litman, 2011a).
<b>Multiple-family households</b>	Two or more families living in one dwelling (Statistics Canada, 2009).
<b>Neighbourhood</b>	Used in the context of the study, a neighbourhood is defined as a Census Tract Profile. Census Tracts are small and their population's range between 2,500 to 8,000 people (Statistics Canada, 2010c).
<b>Refugee immigrant</b>	Person who has arrived in Canada and who seeks the protection of Canada (Amnesty International, 2012).
<b>Rent-Geared-to-Income (RGI)</b>	Where rental subsidies are used to ensure that residents pay no more than 30% of their income on rent (BC Housing Management

	Commission, 2001).
<b>Social Housing</b>	Traditionally, social housing is developed with federal and/or provincial funding and can be managed by the province (BC Housing), non-profit or a co-op (Canadian Centre for Policy Alternatives, 2010).
<b>Shallow and Deep Core Housing Need</b>	A Core Need Income Threshold (CNIT) is the income a household must earn to afford owning or renting a home without government assistance. CNIT's are specific by province and by area (Canada Mortgage and Housing Corporation, 2010). Shallow Need is when a household's income falls within 70% of the CNIT. Deep Need is when a household's income falls below 70% of the CNIT (BC Housing, 2010a).
<b>Suitability of Dwelling</b>	Housing that has enough bedrooms appropriate for the size and make-up of residents in the household (Canada Mortgage and Housing Corporation, 2010).
<b>SkyTrain</b>	TransLink's rapid transit system which runs through the municipalities of Vancouver, Burnaby, New Westminster and Surrey (TransLink, 2012g).
<b>TransLink</b>	Metro Vancouver's transportation authority (TransLink, 2012f).
<b>Urban sprawl</b>	Where the large percentages of a population live in low-density residential developments (single-family dwellings) (Lopez, 2004).
<b>Vancouver Census Metropolitan Area (CMA)</b>	Includes 42 districts, municipalities and/or reserves. Vancouver and Burnaby are included in the Vancouver CMA (Statistics Canada, 2006b).

# 1. Introduction

The concept of land use affecting transportation behaviours is not new and has been explored at length. However, a gap in the current research excludes social housing in British Columbia. This study begins to address that gap by exploring the links between social housing locations and varying levels of public transit availability in Vancouver and Burnaby. The value of this study is underpinned by the fact that transportation is typically one of the largest household expenses after housing.

Increased awareness of the relationship between location, income and transportation bears a direct impact on policy. A recent example is the employment insurance (EI) reform. In May 2012, the Government of Canada announced that claimants would have to apply for employment located within an hour's drive from their residence or more depending on commute patterns in the area (Fitzpatrick, 2012). The government has not released the details on commute times and how those times will be established. Details about commuting habits are crucial. Canadian data regarding commute times is inconsistent and at times not collected at all. The Census does not inquire about the transportation behaviours of those who are not working, those who are too young to work as well as those who are retired. Although this study does not answer the question about commute times, the findings suggest that the answer to this question is complex and the literature surrounding this area is for the most part, undeveloped.

When reviewing public expenditures, there tends to be more emphasis on its financial costs rather than its social benefits. The financial costs are tangible whereas the benefits of social services can be more difficult to measure. The research in this study looks at important issues that were overlooked in the EI reform and reminds us that the benefits of public transportation and social housing extend beyond the provision of a basic social service. They act as a catalyst for additional benefits:

1. **Public transit is a form of social justice.** Public transit enables access to schools, employment, health care and peers. But most important of all, public transit is empowering. It provides a sense of control and independence to those who might otherwise feel limited by their incomes, restores their sense of self-worth, prevents isolation from poverty and facilitates employment and education pursuits.
2. **Social housing and public transit produce health benefits.** Density and street connectivity affect our travel choices and behaviours. Locating housing near a public transit network would encourage physical activity and in turn, improve mental and physical health.
3. **Social housing and public transit produce environmental benefits.** Personal vehicles emit harmful fumes and chemicals, which in turn negatively impact the environment. Locating social housing near public transit may dissuade car ownership.

Housing and transportation are the two largest expenditures for most households (Lipman, 2006), this study explores how the urban environment, income and public transportation availability influence low-income families' transportation choices through the following research question *How do social housing locations impact public transit use among low-income families in Vancouver and Burnaby?*

In the next chapter, I will introduce the municipalities of Vancouver and Burnaby. The subsequent chapters will present the literature and research on the topics of housing, public transportation and the distribution of public services. Chapter 4 will provide an overview of the evolution of social housing in the province of British Columbia. Chapter 5 will present the methodology employed in this study. Chapters 6-9 will provide details about the study sites. Chapters 10 and 11 will conclude with the study findings and conclusion.



## **2. Community Overview**

The municipalities of Burnaby and Vancouver were selected as the study sites because they contain the largest populations in a municipality in Metro Vancouver. Both cities had the greatest number of households waiting for social housing (3,509 in Vancouver and 1,115 in Burnaby<sup>1</sup>) and both municipalities have the greatest number of social housing sites per population compared to other municipalities. The following section will provide background information on the cities of Vancouver and Burnaby, their demographics, work commute methods and income.

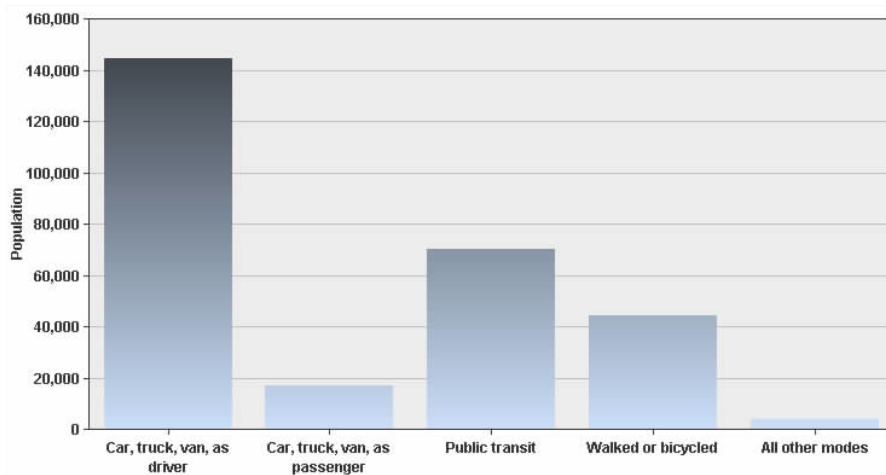
### **2.1. About the Cities of Vancouver and Burnaby**

The City of Vancouver is 114.71 square kilometers in size and has a population of 603,502. Its population increased 10.5% in 2001-2011. Vancouver's population is diverse; in 2006, 45% of the population identified as immigrants. Vancouver has a large Chinese population, making up 57% of Vancouver's visible minority population or 29% of the City's population. The median gross household income in Vancouver was \$47,299 which was lower than the province (\$52,709). The average value of an owned dwelling in Vancouver was \$628,682. This is significantly higher than the provincial average of \$418,703. A quarter of residents (26.6%) were classified as low-income before tax, this

<sup>1</sup> Metro Vancouver. (2011)

is much higher than the provincial rate (17.3%). Statistics Canada provides limited data about travel behaviour. The only information provided is mode of transportation to work. In the 2006 Census, the majority (51%) drove to work and a quarter rode public transit to work<sup>2</sup>. See **Figure 1** below.

Figure 1: Mode of Transportation to Work, Vancouver (2006)



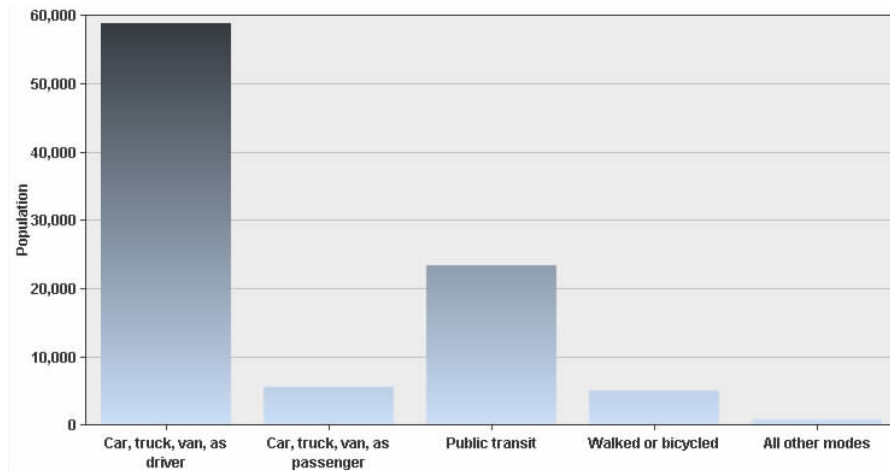
Source: Statistics Canada. (2010a)

The City of Burnaby is 89.12 square kilometers in size and has a population of 223,218. Its population increased 15% in 2001-2011 at a rate greater than the province in the same time period. Burnaby's population is diverse, 50% of the population identified as immigrants. The median gross household income in Burnaby was \$50,205 which was lower than the province. The average value of an owned dwelling was \$481,545 which was higher than the province. A quarter of residents (25%) were

<sup>2</sup> Source for the statistics in this paragraph: Statistics Canada. (2010a)

classified as low-income before tax, this is much higher than the provincial rate. In terms of work commute, the majority (62%) of Burnaby residents drove to work and a quarter (25%) took public transit. Burnaby residents are more likely to drive than residents living in Vancouver<sup>3</sup>. Please see **Figure 2** for more information.

Figure 2: Mode of Transportation to Work, Burnaby (2006)



Source: Statistics Canada. (2010b)

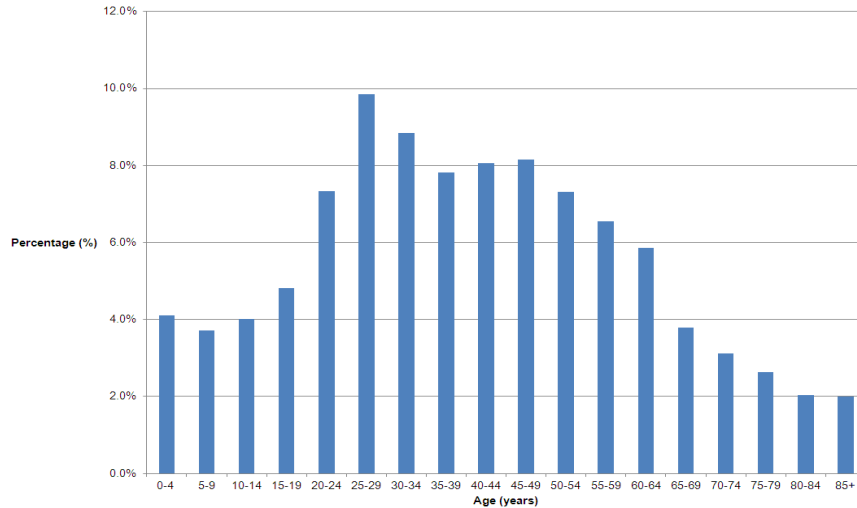
The bulk of Vancouver and Burnaby's populations were working age adults. The 25-29 year age group is the largest age group in Vancouver while both the 25-29 year and 45-49 year age groups were the largest in Burnaby.

Vancouver and Burnaby's population distributions are dissimilar from the traditional population distribution in the sense that the younger generation does not outnumber seniors and adults. Since 1971, the percentage of Vancouver youth (15

<sup>3</sup> Source for the statistics in this paragraph: Statistics Canada. (2010b)

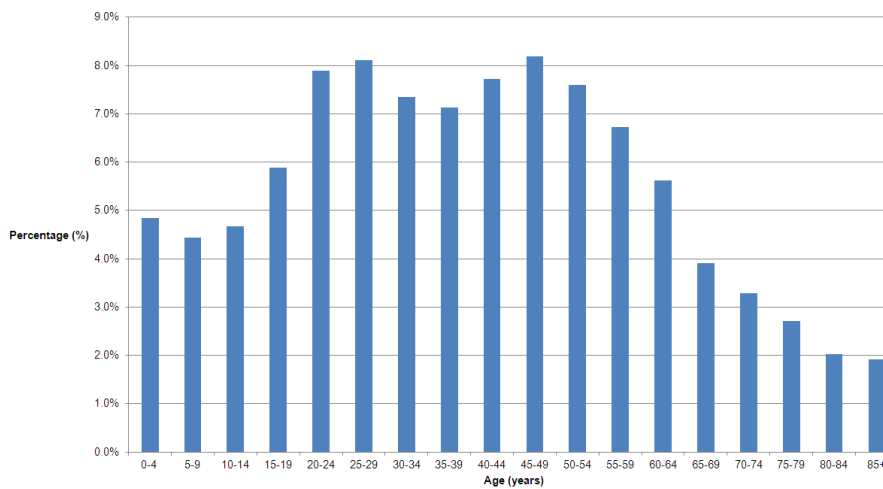
years of age and younger) has decreased (City of Vancouver, 2010). Burnaby’s population distribution is more “traditional” in the sense that there is a more even distribution of youth (children, teenagers). See **Figures 3 and 4** for more information.

Figure 3: Age Characteristics for Vancouver (2011)



Source: Statistics Canada. (2010a)

Figure 4: Age Characteristics for Burnaby (2011)



Source: Statistics Canada. (2010b)

The median income of persons 15 years of age and older was \$23,682 in Vancouver and \$22,319 in Burnaby. Looking more closely at income by family type, the median income was lowest for female lone-parent families (\$35,907 in Burnaby and \$34,931 in Vancouver), followed by male lone-parent families (\$42,037 in Burnaby and \$41,342 in Vancouver). Common-law couple families in Vancouver (\$67,810) made more than their counterparts in Burnaby (\$61,381). This was also the case for married couple families (\$63,808 in Vancouver and \$62,829 in Burnaby).

Table 1: Household Income in Vancouver and Burnaby (2006)

Income	Vancouver (%)	Burnaby (%)
Under \$20,000	21%	18%
\$20,000-\$29,999	11%	11%
\$30,000-\$39,999	11%	11%
\$40,000-\$49,999	10%	10%
\$50,000-\$59,999	8%	9%
\$60,000-\$69,999	7%	8%
\$70,000 and over	32%	34%

Source: Metro Vancouver. (2011)

## 2.2. Public Transit in Burnaby and Vancouver

The organization TransLink provides public transit services in Metro Vancouver. Metro Vancouver's total public transit service area covers 1,800 square kilometres and serves 2,391,300 clients (Shirocca Consulting, 2012). Despite being serviced by one provider, not all municipalities have the same service levels or public transportation modes (SeaBus, SkyTrain, West Coast Express). Public transportation infrastructure varies across Metro Vancouver and this is made evident by TransLink's Frequent Transit Network. Vancouver and Burnaby have more Frequent Transit Network corridors than all other municipalities in Metro Vancouver (TransLink, 2012e). Please see **Appendixes A and B** for more information. Burnaby and Vancouver residents are more likely to walk,

bike or take transit to work compared to other Metro Vancouver municipalities (Metro Vancouver, 2008). A quarter of Vancouver (25%<sup>4</sup>) and Burnaby (25%<sup>5</sup>) residents commute to work by public transit compared to Metro Vancouver overall (16.5%<sup>6</sup>). This data suggests that the built environment and proximity of transportation choices can influence an individual's transportation behaviours (Reilly and Landis, 1996).

### **2.2.1. Public Transit Fares**

TransLink operates on a zone system. TransLink's single fares allow a client to travel for 90 minutes. There is a flat fee of \$2.50 regardless of peak hours and weekends. Cheaper rates or concession fares are available for students and seniors upon the presentation of a GoCard (secondary students) or proof of age (seniors). Children between the ages of 0-4 years ride for free when accompanied by an adult. Post-Secondary students studying at eligible schools qualify for the UPass program, a monthly \$30 collected through a student's (TransLink, 2010b). Please see **Table 2** below for more information about TransLink's fares.

<sup>4</sup> Statistics Canada. (2010a)

<sup>5</sup> Statistics Canada. (2010b)

<sup>6</sup> Metro Vancouver. (2008)

Table 2: Public Transit Fares by Age (as of May 2012)

Zones	Single Fare			Day Pass	Monthly Pass			FareSaver Tickets (10)		
	1	2	3		1	2	3	1	2	3
Children (0-4)	FREE	FREE	FREE	FREE	FREE	FREE	FREE	N/A	N/A	N/A
Children (5-13)	\$1.75	\$2.50	\$3.50	\$7.00	\$46.50	\$46.50	\$46.50	\$17	+\$1.25	+\$2.50
Secondary Students (14-19)	\$1.75	\$2.50	\$3.50	\$7.00	\$46.50	\$46.50	\$46.50	\$17	+\$1.25	+\$2.50
Post-Secondary Students	\$2.50	\$3.75	\$5.00	\$9.00	\$30	\$30	\$30	\$17	+\$1.25	+\$2.50
Adult	\$2.50	\$3.75	\$5.00	\$9.00	\$81	\$110	\$151	\$21	\$31.50	\$42
Senior (65+)	\$1.75	\$2.50	\$3.50	\$7.00	\$46.50	\$46.50	\$46.50	\$17	+\$1.25	+\$2.50

Source: TransLink. (2012a)

Paratransit services called the HandyDART are offered to residents with disabilities and those who require assistance to take public transit. The HandyDART is a door-to-door service. Residents riding the HandyDART pay a separate fare. Concession fares are not valid. Please see **Table 3** below for more information.

Table 3: Public Transit Fares for HandyDART Users (as of May 2012)

Zones	Single Fare				FareSaver Tickets (10)		
	1	2	3	4 or more	1 & 2	3	4+
	\$2.50	\$2.50	\$3.75	\$5.00	\$21	\$31.50	\$42

Source: TransLink. (2012a)

## 2.3. Summary

This chapter highlighted the unique features and characteristics of Vancouver and Burnaby and how they differed from the province. While a little more than a quarter (27%) of British Columbia's population are immigrants, almost half (45%) of Vancouver's population and half (50%) of Burnaby's population are immigrants. Vancouver (\$23,685) and Burnaby's (\$22,319) median household incomes are lower than the provincial median (\$24,867). Fewer Burnaby (62%) and Vancouver (51%) residents drive to work compared to the province (71%), and more Vancouver (25%) and Burnaby (25%) residents take public transit to work compared to the province (10%). These differences illustrate Vancouver and Burnaby's unique transportation, demographic and income

characteristics compared to the province<sup>7</sup>. This study and the following literature review will examine the evolution of the Canadian social housing sector, the presence of bias in the distribution of public services, and question if a fare structure such as the one established by TransLink is equitable and fair.

<sup>7</sup> Source for the statistics in this paragraph: Statistics Canada. (2010a) and Statistics Canada (2010b).



### **3. Literature Review**

The purpose of this literature review is to extract and distil key concepts and ideas that will mould the conceptual framework and guide the data collection and analysis. The literature review will establish the context and a foundation upon which we can begin answering the question of how social housing locations impact transportation behaviour. The following sections interpret and extract relevant ideas related to public services distribution, public transit equity, theories on social inclusion, and social housing and health.

#### **3.1. Differences between Canadian and American Housing and Transportation Policies**

This section will highlight the different approaches and philosophies of the American and Canadian governments. Most of the research cited in this project is American because American housing and transportation studies outnumber Canadian housing and transportation studies. It should be noted that there are important differences in how Canada and the United States approach their housing and transportation policies. Various terms are used within the literature to define housing that is affordable including non-market, below market, social housing and affordable housing. This paper will use the term social housing to refer to residential units operated by government and non-profit organizations. It is important to keep these differences in mind when considering American literature.

In Canada, the federal government has retained a proactive approach especially when it comes to social services such as healthcare, welfare and social housing (Wexler, 1996; Franks, C.E.S., and Olson, D.M., 1993). It is also widely accepted that Canadians tend to be more accepting of policies that limit their property rights if they are

seen to benefit the public good (Wexler, 1996). In the United States, the Civil Rights Movement was instrumental in contributing to an affordable housing program (U.S. Department of Housing and Urban Development, 2007). Similar to Canada, the United States federal government downloaded the responsibility of housing to the states and local governments in the 1980s (Schwartz, 2006). Dissimilar to Canada, American cities have significantly more power given their access to various revenue sources compared to Canadian cities (Slack, 2003). Dissimilar to the United States, the Canadian provinces have more power and their overall budgets exceed those of their American state counterparts (McMillan, 2012) and Canadian social programmes tend to be tested by the provinces before they are implemented by the federal government resulting in a wider social safety-net (Wexler, 1996).

In both Canada and the United States, opinions surrounding the role of government in social housing have been heavily disputed between the private industry (banks, building material suppliers) and advocates for low-income families (churches, unions, mayors) (Field, C.G. 1997). Support for affordable housing programs declined in the 1980s and planning policies such as zoning and subdivision controls were enforced. A consequence of these controls was the declining consideration for affordable housing with new developments (Advisory Commission on Regulatory Barriers to Affordable Housing, 1991).

In terms of transit, Canada's transit systems are heavily funded by provincial, regional and municipal governments whereas the Americans have vast highways which are funded by federal highway funds (Wexler, 1996). The public transit needs and supply of the two countries are different and the literature is reflective of this. There was nearly three times as many revenue miles in public transit in Canada compared to the United States, and the Americans had nearly four times as many lane-miles of expressway per capita compared to Canada (Wexler, 1996). The bias towards expressways has created a reliance on the personal vehicle in the States whereas Canadians are more likely to walk or take public transit to work (Goldberg, 1985).

### **3.1.1. *The Role of the Canadian Government in Social Housing***

The Canadian social housing sector has changed dramatically in the past 20 years. Prior to the 1990s, the federal government was heavily involved by way of subsidies and administration. Starting in 1986, with the Social Housing Strategy, the federal government has since extricated itself from the social housing sector and transferred the administration to the province. This change can be attributed to the neoliberal movement. In the 1980s, the Thatcher and Reagan administrations adopted and practised a concept called neoliberalism (Peck and Tickell, 2002; Piven, 2007). It is recognized that Canada formally merged with the neoliberal movement through its adoption of the Free Trade Agreement in the 1980s although organizations such as the Business Council on National Issues was formed in 1976 and are considered the earlier establishments of Canadian neoliberalism (Carroll and Shaw, 2001). Neoliberalism is the voluntary reduction of the role of government. The logic behind the concept is to decrease dependence on the government and thus reduce public expenditures. An unfortunate result of neoliberalism is that it has a tendency to commodify public services and goods (Giroux, 2005). Public services such as welfare and social housing have all been impacted by neoliberal logic (Giroux, 2005). Advocates criticize these measures, calling them harmful and creating demands in other areas such as health care and homelessness.

The pressures of neoliberalism contributed to the finalization of the transfer of responsibility for housing from the federal government to the provincial government. The devolution of social housing began in 1986 but was completed in 1993. The federal government's decision to step away from housing was a financial decision, as the offloading of housing would translate into reduced debt (Hulchanski, 2003) and the devolution was also related to Constitutional processes in the 1980's (Hulchanski, 2003). British Columbia was one of two provinces to carry on its own housing programs after 1993. The cut in federal funding dealt a significant blow to the province's ability to sustain the provision of social housing at similar levels prior to 1993.

That withdrawal also meant the federal government ceased funding for new social housing. Although the federal government continues to provide some funding, its

role and responsibilities have changed dramatically in the span of two decades. Canada, apart from the United States has the strongest private sector dominated housing market and the smallest social housing sector compared to other Western nations (Hulchanski, 2002).

Today, social housing in Canada is funded by a combination of federal and provincial dollars. Some or, a municipality may contribute to social housing development by leasing the land at low monetary cost to the housing provider, waiving development cost charges and/or waiving municipal application fees (Metro Vancouver, 2007). These incentives are not mandatory and are provided at the municipality's discretion.

A 2010 study called *Unpacking the Numbers* investigated how much new social housing was being built in the Province of British Columbia. The report made two key observations. The first observation is that, although the government has released funding, it tends to be focused in three areas that do not create new social housing: rental assistance supplements, emergency shelter beds and the purchase of SROs (single room occupancy). The second observation was there has only been an increase of 280 social housing units in 2005-2010 after apartment conversions were taken into consideration. This is a stark difference to the 1970s-1990s when 1,000-1,500 new social housing units were constructed every year (Canadian Centre for Policy Alternatives, 2010).

### **3.2. Theories on Public Services Distribution**

Existing literature regarding public services and resources distribution have centered around utilities, parks, police and libraries (Levy, 1974; Lineberry, 1977; Mladenka, 1977). To the author's knowledge, there is no research around the equal distribution of social housing and public transit in Metro Vancouver.

Public services can be distinguished on two levels: equality and equity. Services are *equally* distributed when the same services are evenly distributed (e.g. sewage

system). Services are *equitably* distributed when neighbourhoods are assessed and services are provided based on their individual attributes (e.g. if a high-density neighbourhood generates more garbage than another, they may require more frequent garbage pickup) (Rich, 1979). As such, equitable and equal service delivery may produce unequal outcomes. This is relevant because public services impact quality of life (Harvey, 1973).

In cases where public services are unequal, the outcome falls into either patterned inequality or unpatterned inequality. Patterned inequality is the uneven distribution of public services due to political pressure, neighbourhood pressure, actions and decisions by staff or the type of service (Miron, 1988). Unpatterned inequality is defined unequal service distribution which cannot be traced back to any of those factors (neighbourhood organizations, political pressure, and bureaucracy). Pacione (2001) suggests that unpatterned inequality is a result of market forces and is influenced by a person's ability to pay for the service based on their capacity and use. If this market-driven form of inequality exists, does it diminish the experiences and quality of life of those with less or no market power? To apply this concept to the context of this study, user fees are one of TransLink's major sources of revenue (fares made up 32.7% of TransLink's revenue in 2009)<sup>8</sup>. Does this lead to a bias towards creating new services and routes in areas where residents are more likely to possess the financial resources to afford public transit? According to TransLink's Multiple Account Evaluation (MAE), this bias does not exist. TransLink's goal is to provide services to the maximum number of people possible. The MAE questions the economic, environmental, financial, social,

<sup>8</sup> TransLink. (2010a)

deliverability and viability of a proposal. Low income populations are identified as a factor in their social category (TransLink, 2012b).

### **3.2.1. Theories on Public Transit Equity**

Not all transit riders ride public transportation out of choice. For some, it is their only option. Transportation writers such as Walker (2011) note two different types of riders: “choice riders” are individuals who can afford a car but may choose transit for other reasons; and, “captive riders” are individuals who cannot afford a car and ride public transit regardless of the level of service. The two definitions assume a more important role when considering service distribution and a municipality’s responsibility to serve these populations. Is there a responsibility to enhance service in areas with captive riders? Walker (2011) elaborates:

*“Dividing up riders this way leads to the idea that transit must compete for choice riders, while captive riders will ride no matter how poor the service gets. These categories are imposed on reality, not derived from it. Transit dependence, like wealth itself, is a spectrum with vast number of people in grey areas between choice and captive.”* – Walker (2011). P. 43

Prior studies concerning public transit have focused on residents commuting between work and home; there has been little research conducted on non-work travels. Work travel consists of only 15% of all trips (Pisarski, 2006), which means the existing research is overlooking a potentially diverse and significant set of data. This study attempts to address that gap by inquiring about social housing resident’s work and non-work travels, locations they frequent outside of work, transportation mode(s) and the reason(s) why they chose their specific modes of transportation are explored. Prior studies have been limited to individual travelers; they have disregarded age, cultural background and the economic circumstances that affect an individual’s transit needs (Reily and Landis, 1996; Dobbs, 2005). This study will investigate these factors and determine how they affect a household.

Transit equity is defined by way of three categories: 1) *Horizontal equity* is the treatment of everyone equally regardless of race, income or gender. 2) *Vertical equity with regard to income and social class* is considerate of economically and socially disadvantaged groups so that they do not bear excess costs beyond their means. 3) *Vertical equity with regard to mobility need and ability* is considerate of users with disabilities and special needs (Victoria Transport Policy Institute, 2011). The complication in interpreting transit equity is that it is subjective. Different equities appeal to different political ideologies. Another complication is that the categories can conflict with one another. For example, a discount for seniors may satisfy vertical equity but it contradicts the foundations of horizontal equity (Litman, 2003). TransLink's existing discounts and fare concessions offer some economic inclusion but they are not applicable to everyone. TransLink's fare discounts satisfy vertical equity and parts of horizontal equity. This study addresses the exclusion of certain individuals with similar if not greater financial disadvantages and who could benefit from these discount programs.

### **3.3. Social Inclusion and Exclusion**

Social inclusion is ensuring the valued participation and contribution of children and adults in society, wherein everyone feels like they belong, are accepted and recognized. Social inclusion is a complex topic as it requires society to validate our differences such as our disabilities, gender, and family structures (Omidvar and Richmond, 2005). Within North America, residents are experiencing discrimination in acquiring housing. They are being asked to provide extra items such as supplementary proof that they can pay for rent and are being stigmatized in other negative ways, such as their accents or family structures (Feins and Bratt, 1983; Lundy, 2001; Yinger, 1998; Murdie, Chambon, Hulchanski and Teixeira, 1995). A consequence of this stigmatization is it creates concentrated enclaves of low-income households or "income ghettos" (Kazemipur and Halli, 1997; Ostendorf, Musterd and Devos, 2001). But even more concerning are the repercussions of social exclusion. Residents may develop new values that exclude education, work and family. The lack of role models and the

reputation of a neighbourhood could negatively impact an individual's social inclusion (Robson, 1988).

Literature suggests that social exclusion can be exacerbated by the built environment through spatial mismatch. Spatial mismatch is a concept wherein the separation of housing from jobs that are appropriate for low-income households or provide opportunities for advancement (i.e. "good jobs") encourages inequity. By failing to link housing, jobs and public transit, the viability of all three are impacted (Kain, 1968). This logic is also endorsed in the health sector as numerous studies have confirmed that social and economic environments are determinants of health (Mustard and Frank, 1991; Wilkinson, 1994). Access to healthy affordable quality housing snowballs into numerous benefits: it pulls people out of poverty (Allard and Danziger, 2003); it enables people to afford basic needs such as food, medication and clothing; and, contributes to a persons' sense of belonging and stability in life (Bryant, 2003). If that is the case, then public transportation has a much more important role. It is a facilitator, connecting the individual to the opportunities to sustain or to advance themselves; to afford basic needs; and, contributes to a persons' sense of belonging such as maintaining relationships with others who provide support (Bryant, 2003). When public transportation is interpreted from this perspective (e.g. if low-income people are forced through housing choice to live on the outcomes of the area, with poor transit, access to better-paying jobs, educational opportunities may be reduced), it assumes a much stronger and empowering role.

### **3.4. Summary**

The literature regarding low-income resident commute patterns and financial expenditures made on transportation by low-income residents remains largely undeveloped. To the author's knowledge, the research proposed here is the first to link social housing locations to public transit usage in the province of British Columbia. The literature review confirms that the built environment can be leveraged as a tool by low-income residents to improve their circumstances. The following chapter will elaborate upon the evolution of the social housing sector in the province, the demand for social



housing in the province and hypothesize reasons why the demand for family social housing is so high.

## **4. Social Housing in BC**

The following section will present a top-down narrative of the evolution of social housing in the province and Vancouver and Burnaby. Social housing serves a vital purpose. It extends housing opportunities to households who otherwise might be discriminated against, households who cannot afford decent quality housing in the private market and/or households who cannot find affordable housing in desirable living areas (Hills, 2007). The social housing sector in the province of British Columbia has evolved dramatically over the past 20 years.

From the 1960s to the 1990s the federal government was a vital contributor to social housing funding, funding up to 1,000-1,500 new social housing units in the province every year. Since the downloading beginning in the late 1980s, the government's definition of housing services has narrowed to focus on homelessness and support services. This adjustment has impacted the amount of funding available to fund new social housing. It is estimated that the total number of new social housing units constructed in the province from 2006-2011 was only 280 units (Canadian Centre for Policy Alternatives, 2010).

From 2006-2011, BC Housing posted a decline of 2,820 units for seniors and families, this decline was more pronounced for low-income seniors. The overall decline is a concern given BC Housing's long waitlist (there were 13,400 applicants on BC

Housing's waitlist in 2008)<sup>9</sup>. The decline in social housing for families illustrates an uneven distribution of resources that favours individuals who are homeless, living with a disability, battling addictions and/or mental health issues. Low-income families are compelled to adapt to an increasingly expensive private rental market (Canadian Centre for Policy Alternatives, 2010). Please see **Table 4** for more information.

Table 4: BC Housing Initiatives, Households Assisted by the Continuum of Housing and Support Services (2006-2011)

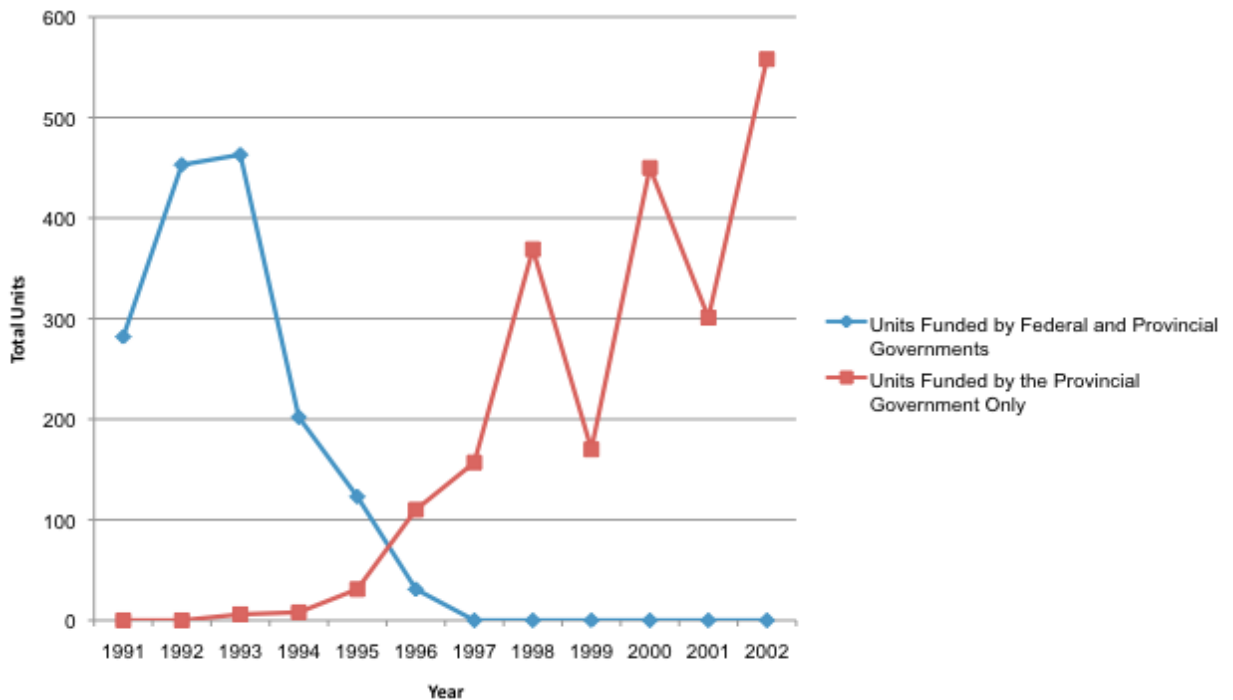
	2006-07	2007-08	2008-09	2009-10	2010-11	Difference 2006-2011
Low-Income Seniors	23,880	23,500	21,940	20,610	21,020	-2,860
Low-Income Families*	19,880	20,260	20,760	20,720	19,920	40
Total	43,760	43,760	42,700	41,330	40,940	-2,820

\* Note that this includes Aboriginal and non-Aboriginal families  
Source: Canadian Centre for Policy Alternatives. (2010)

Another form of social housing is Rent-Geared-to-Income (RGI) housing. RGI are units that provide rents specific to a household's income, typically at 30% of their income. The purpose of RGI units is to provide housing that is affordable regardless of a household's income. RGI tends to be more diverse in terms of income mix as compared to "targeted" core need housing. A timeline of the RGI unit construction illustrates the federal government stepping aside and the provincial government stepping in. Please see **Figure 5** below for new RGI units constructed in Vancouver's from 1991-2002.

<sup>9</sup> Canadian Centre for Policy Alternatives. (2010)

Figure 5: Vancouver New RGI Unit Count (1991-2002)



Source: Pierrot, S. (n.d.).

From 2002 onwards, there has been little to no funding for low-income family housing. The funding that has been made available has been targeted to frail seniors, and individuals who require supports for addictions and/or mental health. Although there is the Rental Assistance Program (RAP) for families, the program has been criticized by Metro Vancouver for its narrow mandate (Metro Vancouver, 2010). In order to qualify for RAP, a family must meet the following criteria (BC Housing, 2010d):

- An income of \$35,000 or less;
- At least one or more children under the age of 19, and/or under the age of 25 and registered full-time as a student, and/or of any age but are limited to mental or physical infirmity;
- Parent must have been employed at one point during the last year;
- Have lived in British Columbia for a full 12 months preceding the date of application;
- Have filed an annual income tax return;

- Some or all annual household income comes from employment;
- Have less than \$100,000 in assets; and,
- Pay more than 30% of their income on rent.

There is a lack of rental assistance programs for singles, couples, and families with children over the age of 18. When it comes to developing affordable housing, non-profit organizations and developers constructing low-income family housing have had to rely on their own equity or the generosity of municipalities (waiving of DCCs and planning fees) and regional government (waiving of DCCs) to make housing affordable. However the waiving of these charges and fees are not always granted nor are they guaranteed.

The downloading of social housing is nearly two decades old, the remainder of this chapter will illustrate how Burnaby and Vancouver's social housing sector has transformed in the past two decades.

## **4.1. Burnaby and Vancouver's Housing Market**

In 2012, Vancouver was ranked as North America's most expensive city in terms of standard of living, and it ranked as 37<sup>th</sup> most expensive city in the world<sup>10</sup>. Headlines such as these suggest difficulty for Vancouver residents to move from the rental market into home ownership. From 2001-2006, the value of Vancouver's residential dwellings increased 75% (from \$358,374 to \$628,682<sup>11</sup>) while Burnaby's increased 66% (from

<sup>10</sup> Reuters. (2012, February 15)

<sup>11</sup> Statistics Canada. (2010a)

\$289,056 to \$481,545<sup>12</sup>). The question of whether the home ownership market is out of reach for Vancouver residents has been asked by news sources in the past (Bryan, 2012). If that is the case, this has repercussions on the rental market as it doesn't facilitate the movement of individuals shifting from rental to home ownership. In an effort to maintain their affordability, more households may be lingering in the rental market longer than they normally would. The next section will summarize the private rental housing markets in Burnaby and Vancouver.

## **4.2. Burnaby and Vancouver's Rental Housing**

To understand if Vancouver and Burnaby have high demands for private rental housing, vacancy and rent statistics need to be studied. Rents in Vancouver tend to be higher than rents in Burnaby<sup>13</sup>. According to Canada Mortgage and Housing Corporation (CMHC) from 2010-2011, the overall average townhouse and apartment rents in Vancouver increased 4.1% (\$1,062 to \$1,106) and 1.7% (\$932 to \$948) in Burnaby<sup>14</sup>. In Vancouver, bachelor units saw the largest rent increase of 4.1% (from \$846 to \$881), followed by the two-bedroom units at 3.8% (from \$1,442 to \$1,498), one-bedroom units at 3.1% (from \$1,013 to \$1,045) and three-bedroom units at 2.4% (from \$1,802 to \$1,846)<sup>15</sup>. In Burnaby it was the reverse, the larger units saw the strongest rent increases. The three-bedroom's increased 3.8% (from \$1,313 to \$1,364), followed by the one-bedroom units at 1.6% (from \$856 to \$870), two-bedroom units at 1.3% (from

<sup>12</sup> Statistics Canada. (2010b)

<sup>13</sup> Statistics Canada. (2010a), Statistics Canada. (2010b)

<sup>14</sup> Canada Mortgage and Housing Corporation. (2011)

<sup>15</sup> Canada Mortgage and Housing Corporation. (2011)

\$1,094 to \$1,109) and bachelor units at less than 1% (from \$726 to \$733)<sup>16</sup>. Overall, rents increased in Vancouver and Burnaby.

Vancouver and Burnaby contain significant informal rental markets. This was confirmed in a search on a popular rental website on May 2012 (see **Table 5** below). The rents observed on the rental website are higher than the prices reported by CMHC. The numbers obtained by CMHC do not represent single detached dwellings (single dwellings can be subdivided and rented out as individual units) and they represent occupied suites whose rents are lower because the rents were established in the past and are controlled by rent control (Canada Mortgage and Housing Corporation, 2012c).

Table 5: Average Rent by Bedroom Type, Vancouver and Burnaby (May 2012)

	<b>Vancouver</b>	<b>Burnaby</b>
Average rent for bachelor unit	\$888	\$800
Total advertisements	82	55
Lowest bachelor rent	\$450	\$475
Highest bachelor rent	\$1,595	\$1,780
Average rent for one-bedroom unit	\$1,567	\$917
Total advertisements	54	39
Lowest one-bedroom rent	\$650	\$650
Highest one-bedroom rent	\$5,500	\$1,375
Average rent for two-bedroom unit	\$2,343	\$1,613
Total advertisements	69	65
Lowest two-bedroom rent	\$600	\$925
Highest two-bedroom rent	\$8,900	\$1,500

Source: Craigslist (2012)

<sup>16</sup> Canada Mortgage and Housing Corporation. (2011)

Housing advocates recommend a vacancy rate of 3% as a healthy rental market. From 2010-2011, the vacancy rates in Vancouver and Burnaby (excluding Burnaby's three-bedroom units) were below 3%. The overall vacancy rate for apartments and townhomes decreased both in Vancouver (1.3% to 0.7%) and Burnaby (1.9% to 1.4%). Within Vancouver, the vacancy rates of all dwelling types excluding the three-bedroom units dropped below 1%<sup>17</sup>.

In addition to purpose built rental housing, rental units can also be rented out by home owners. Investors may purchase a unit and rent it to a tenant (CitySpaces Consulting, 2009) which suggests an overlap between the rental and home ownership sectors. In 2011 and up to April 2012, ownership housing starts outnumbered purpose-built rental housing starts (Canada Mortgage and Housing Corporation, 2012b). Some of these ownership units were advertised for rent on the private rental market. In 2009, approximately 27% of Vancouver's apartment condominium stock was rented. Condo units which were rented out privately tended to have higher rents than purpose-built rentals because they were newer, included more amenities and had higher quality finishes (CitySpaces Consulting, 2009). Please see **Table 6** for more information.

<sup>17</sup> Source for statistics in this paragraph: Canada Mortgage and Housing Corporation. (2011)



Table 6: Housing Starts, Vancouver and Burnaby (2001-2010)

	Rental Starts		Ownership Starts	
	Vancouver	Burnaby	Vancouver	Burnaby
2001	2,048	4	n/a	n/a
2002	590	59	n/a	n/a
2003	345	119	n/a	n/a
2004	367	0	n/a	n/a
2005	126	146	n/a	n/a
2006	244	0	3,288	1,594
2007	139	0	3,948	2,268
2008	269	0	4,401	1,643
2009	192	5	1,384	847
2010	594	70	3,481	1,218

Source: Metro Vancouver (2011)

### 4.3. Social Housing in Burnaby and Vancouver

Statistics regarding disabilities and poverty are relevant to the social housing sector because they tell a tale about basic needs in a community. In 2006, BC had the highest child poverty rate in the country at 21.9% for the fifth year in a row. More than half of these children lived with parents who worked the equivalent of a full-time, full-year job (First Call BC Child and Youth Advocacy Coalition, 2008). Despite working and/or earning the equivalent of full-time jobs, households are still unable to pull themselves out of poverty, not for lack of trying but because there is a shortfall (Kerstetter, 2010).

In 2006, 4.4 million Canadians reported a disability. British Columbians comprised 16% of the nation's disability population (Human Resources and Skills Development Canada, 2012b). Disabilities are not limited to visible disabilities such as wheelchair use; there are "hidden" disabilities which can impact an individual on various levels ranging from their memory, agility and speech. This was evident in the interviews with residents. Approximately half of the families interviewed were on disability and half of those used wheelchairs. Often times, residents with disabilities will require a range of modifications (ramps, rails, walk-in shower, non-slip flooring, lowered countertops) to accommodate their specific disabilities. The presence of a disability incurs extra costs

through mobility aids, support workers and renovating parts of their home to accommodate their disability. The disability may also affect an individual's income. To qualify for disability assistance, a household's income cannot exceed a certain amount per month. This may prevent an individual on disability from seeking employment or remain unemployed to continue qualifying for disability supports. It is unclear if individuals with disabilities have a higher need for affordable social housing but what is clear is their disabilities may limit their mobility and areas of travel. When considering Kain's (1996) spatial mismatch theory, we realize the importance of linking the three components (jobs, housing, transit) especially for those with disabilities.

CMHC generally defines a household as having an affordability problem if the household is spending 30% or more of their income on rent. Households spending in excess of 50% risk homelessness. More than half of residents in the Vancouver Central Metropolitan Area (CMA) are paying 30% or more of their income on housing and 36% of Vancouver CMA households are at risk of homelessness. Please see **Table 7** for more information.

Table 7: Gross Rent as a Percentage of 2005 Household Income, Vancouver CMA

	<b>Vancouver CMA</b>		
Less than 15%	48,795	17.3%	
15% - 19%	40,075	14.3%	
20% - 24%	37,330	13.3%	
25% - 29%	31,800	11.3%	
30% - 34%	22,680	8.1%	<b>57%</b>
35% - 39%	15,630	5.6%	
40% - 49%	20,875	7.4%	
50% or more	63,865	22.7%	
50% - 99%	37,110	13.2%	
<b>Total</b>	281,045	100%	

Source: Statistics Canada. (2006b)

The most recent rents are significantly higher than what can be afforded by most low and moderate income households. In May 2012, the minimum wage in the province increased to \$10.25 an hour (Ministry of Labour, Citizens' Services and Open Government, 2011). A single parent working 40 hours a week at minimum wage would earn a gross income of \$1,640 a month. CMHC recommends a household spend no

more than 30% of its income on housing. A single parent in that scenario would have \$495 to spend on rent. This is considerably lower than CMHC's average rents for a two-bedroom unit in Vancouver (\$1,498) and Burnaby (\$1,109).

The unaffordability of Vancouver and Burnaby's rents extend to seniors, particularly those receiving basic Guaranteed Income Supplement (GIS) / Old Age Security pension (OAS) single person pension (\$1,002.40 in March 2012<sup>18</sup>). For many seniors, this pension is their only source of income. The average rent for a one-bedroom apartment in Vancouver or Burnaby far exceeds a senior single's pension by an excess of \$745 in Vancouver and \$570 in Burnaby. This amount excludes other expenses such as phone, public transit, groceries and entertainment. To afford market rent alone, the senior would have to consider employment or apply for SAFER (Shelter Aid for Elderly Renters, a BC government rent subsidy program).

As mentioned previously, social housing serves a vital purpose as evidenced by the data presented above. Social housing provides housing opportunities to households who may encounter difficulty in finding and retaining decent quality housing. There are 108 social housing sites in Vancouver and Burnaby (excluding co-ops)<sup>19</sup>. They are mostly apartment buildings (67 sites), there are also apartments and townhouse hybrids (4 sites), and townhomes (37 sites)<sup>20</sup>. Metro Vancouver estimates there are 6,170 social housing units in Burnaby and 23,370 units in Vancouver (including co-op housing)<sup>21</sup>. The size of these projects vary from small (6 units) to large (237 units). The projects are

<sup>18</sup> Service Canada. (2012)

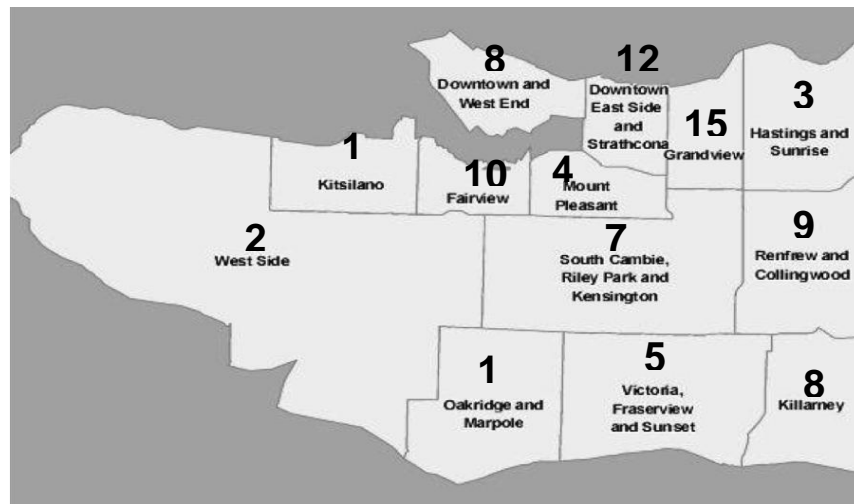
<sup>19</sup> BC Housing. (2010c)

<sup>20</sup> BC Housing. (2010c)

<sup>21</sup> Metro Vancouver. (2011)

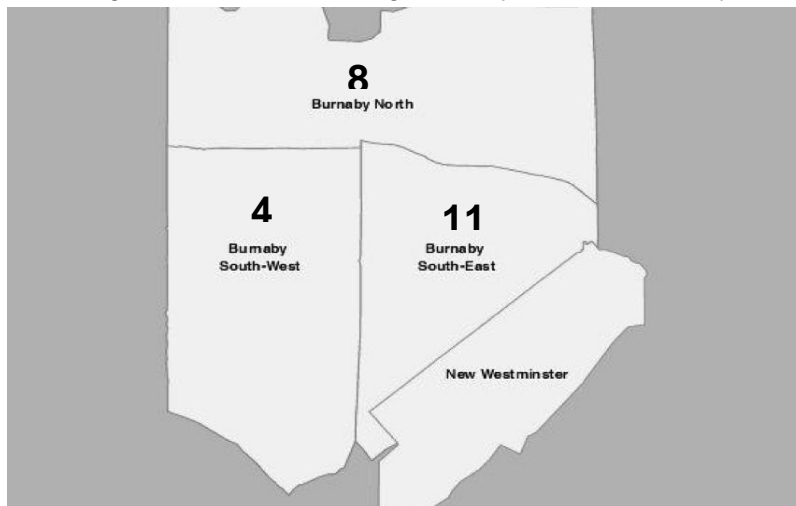
managed by a combination of the province (BC Housing), non-profits and the municipality. **Figures 6 and 7** illustrate the total number of social housing sites (excluding co-ops) located in distinct areas in Vancouver and Burnaby. There is an uneven geographic distribution of social housing within Vancouver. Half of the sites are clustered around downtown and the east edge of the city. Burnaby's social housing distribution is more dispersed with most of the sites located in North and Southeast Burnaby.

Figure 6: Social Housing Sites by Area in Vancouver



Source: BC Housing. (2010c)

Figure 7: Social Housing Sites by Area in Burnaby



Source: BC Housing. (2010c)

## 4.4. Summary

It is evident that there is a social housing need in Vancouver and Burnaby. While the waitlist for family and disability social housing declined from 2007-2009 (the waitlist for family housing dropped from 5,160 to 2,793 and the waitlist for disability housing dropped from 1,875 to 1,422), waitlists for all household types (family, single, senior, disability) have increased steadily since 2009. The 2011 waitlist for housing was highest for families (3,304 households), followed by seniors (2,373 households), persons with disabilities (1,834 households), singles (808 households) and units that are wheelchair accessible (268)<sup>22</sup>. The subsequent chapters will elaborate upon how low-income families in Vancouver and Burnaby weigh their transportation choices given their built environments, limited income and other factors. This was done through a mixed methods approach which will be explained in the methodology section below.

<sup>22</sup> Metro Vancouver. (2011)

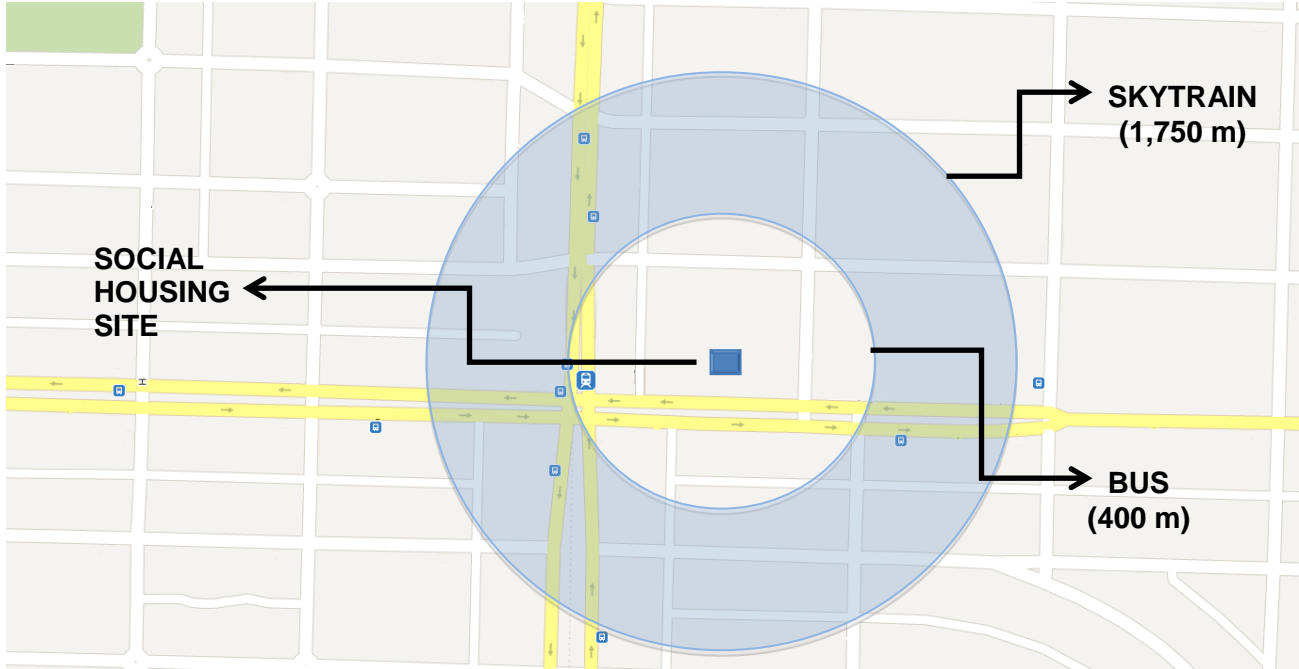
## 5. Methodology

The methods used in this study employed a combination of quantitative and qualitative research methods. Quantitative research was used to set the context and the foundation upon which the social housing sites and interview participants were selected for further research. The qualitative research addressed the unique challenges and dynamics of each family by delving into their experiences and views on public transit.

### 5.1. Selection of Social Housing Sites

Three types of data were collected for all social housing sites in Vancouver and Burnaby: 1) **Social housing**. Dwelling type, total number of units, bedroom types and address were obtained from BC Housing's Housing Listings tables or the individual housing provider's websites. 2) **Community data** such as income, employment, education, mode of transportation to work, family structures and household size were obtained from Statistics Canada by Census Tract for all social housing sites in Vancouver and Burnaby. 3) **Public transportation**. A public transportation score was created for each social housing site. The frequency and accessibility of public transportation was taken into account for all social housing sites in Vancouver and Burnaby. A score was calculated for all social housing sites based on their proximity to a SkyTrain station, bus stop and bus routes. To calculate the score, only bus stops located within a 400 metre radius and SkyTrain stations located within a 1,750 metre radius were considered (O'Sullivan and Morrall, 1996). The score was calculated in 2 steps (please refer to the **Figure 8** below for an example):

Figure 8: Calculation of Transportation Score



Source: Google. (2012)

**Step 1: Total # SkyTrain stations within 1,750 m + Total # bus routes within 400 m**  
(1 SkyTrain station + 4 bus routes = 5)

**Step 2: Divide total from step 1 by 2**  
(5/2 = a score of 2.5)

All social housing sites that identified a SkyTrain station within 1,750 metres of the site were eliminated. Sites with good access to SkyTrain stations were not considered since SkyTrain stations are often supplemented with bus loops and have strong bus service. There were on average 6 bus routes servicing SkyTrain stations in Vancouver and 5.3 bus routes in Burnaby.

The remaining sites that did not identify a SkyTrain station within 1,750 metres were then listed in order by their individual scores, from best transit access to worst transit access and the list was split in half. The first half with the lowest scores were labelled *poor SkyTrain and bus access*. The latter half with the highest scores were labelled *poor SkyTrain and good bus access*. Please see **Appendix F** for more information on the scores.

To aid respondent selection, two sites with good bus access were selected to compare against two sites with poor bus access. To ensure a fair comparison, only neighbourhoods with similar demographics and characteristics were compared to one another. To determine which four sites would be selected for the study, the researcher sorted through all the demographic and community data to determine which social housing sites were most similar to one another. The goal was to compare two sites with similar demographic and neighbourhood characteristics, but contrasting public transportation access. See **Table 8** for the final sites. In summary, Sites B and D have similar demographic and community characteristics, and Sites A and C have similar demographic and community characteristics. However, Sites A and C have different demographic and community characteristics when compared to Sites B and D.

Table 8: Study Sites

<b>POOR SKYTRAIN, POOR BUS</b>		<b>POOR SKYTRAIN, GOOD BUS</b>
Site B - South Vancouver	<i>*Similar to...</i>	Site D - East Vancouver
Site A - South Burnaby	<i>*Similar to...</i>	Site C - North Burnaby

*\*Similar refers to similar built environments, resident demographics, population size, education of residents, transportation methods to work, etc.*

The purpose of identifying sites for further study is to understand how bus access can affect a family's decision to use or not use transit, and how the built environment discourages or encourages public transit use.

Additional research methods were applied to the selected sites (Sites A, B, C and D). To calculate how easily residents can access the bus stop(s) from their homes, the Network Connectivity Index was applied to the selected sites. The index calculates the number of links that a pedestrian can use to access transit. It is calculated by taking the number of links (number of streets segments between the intersections) and dividing it by the number of nodes (number of intersections). A score can range from <1.3 (suburban) to >1.5 (grid pattern), the higher the score the more accessible it is (State of Florida Department of Transportation, 2007).



Two other measurements which were applied to the four selected sites was bus frequency on the weekday, weekend and in the evenings. Findings in Metro Vancouver's (2012) apartment study suggest car ownership rates are lower near Frequent Transit Networks. The second and final observation was site visits. The purpose of the site visits was to observe the built environment and note items such as missing sidewalks, informal pedestrian access paths (dirt paths), safety (lighting at night) and topography. See **Appendix G** for more information on the bus frequencies of each site.

## 5.2. Interviews with Residents

Interviews were conducted with stakeholders and social housing residents from the four study sites. Flyers advertising the study were circulated to all residents. See **Appendix H** for a copy of the flyer. The flyer was either circulated by the property manager or taped to their doors by the researcher. To encourage participation, a gift voucher was provided in exchange for their cooperation. The flyers did not generate a strong response (a total of 4 interviews). To compensate for the flyers, the researcher made numerous site visits to three social housing sites (Sites B, C and D). During site visits, the researcher positioned themselves at the entrances of the building and approached residents who were entering or existing the building. In the case of townhomes with individual entrances, the researcher walked the sites and approached residents who were walking to or from their homes. Approximately 12 sites visits were made over the months of March-June 2012 to Sites B, C and D. The site visits made by the researcher generated 8 interviews.

The length of the interviews ranged from a half hour to two hours. The interviews were conducted in coffee shops, in the community room of the housing complex, in the resident's home and only one interview was conducted by phone. Almost all interviews were recorded on a digital voice recorder. After the interviews, the researcher transcribed each interview into a word processor. Please see **Table 9** for basic demographic and socio economic information on the 12 interviews.

Table 9: Demographic and Socio Economic Information of Interview Participants

<b>Category</b>	<b>Total</b>
<b>Sex</b>	
Female	9
Male	3
<b>Age</b>	
18-25	1
26-40	4
41-65	1
Unknown	6
<b>Ethnicity</b>	
Not a visible minority	5
West Asian	3
Latin American	2
Aboriginal	1
South Asian	1
<b>Car Ownership</b>	
One car	4
More than one car	1
No car	7
<b>Member(s) of household on Disability</b>	
Yes	6
No	32

Overall, 12 interviews were conducted at Sites A, B, C and D:

- 4 interviews were conducted at Site A;
- 2 interviews were conducted at Site B;
- 4 interviews were conducted at Site C; and,
- 2 interviews were conducted at Site D.

The goal of the interviews with the low-income adults was to develop an understanding of how they shaped their transportation methods based on their incomes. Interviews were an appropriate method because it allowed the researcher to cater questions to each household. The interviews uncovered comprehensive information that could not have been obtained through a survey. The sample size of 12 includes a diverse range of families:

- single father on disability with a teenager and young child
- single mother on disability with a young child
- single mother on disability with three young children

- single mother on disability with a teenager
- single mother with an infant and teenage son
- single mother with a teenager
- two-parent household with three teenagers
- two-parent household with an adult child
- two-parent household with two young children
- two-parent household with one parent on disability with infant and a toddler
- two-parent household with a young child and one teenager
- adult child in a single-parent household

The sample size illustrates the diversity of families and how the transportation needs can vary for each household. No two families or interviews were alike. The interviews were semi-structured. Interview participants were provided with a description of the study and a consent form prior to the interview. The interview questions may be summarized by the following categories (please see **Appendix C** for a list of interview questions posed to social housing residents):

- Information about members in the household (household size, age of children, employment, disability, income, percentage of income spent on transportation and housing)
- Transit in the neighbourhood (awareness of transit in the neighbourhood, can they list the routes and frequencies)
- Transportation needs (car ownership, transit pass, which routes they use)
- Non-work travel (where they go, how often and how do they get there)
- Work-related travel (work location and how do they get there)

### **5.3. Interviews with Stakeholders**

Emails requesting an interview were sent to stakeholders. Stakeholders were selected from the social housing, planning and transit sectors. Interviews with stakeholders lasted between one to two hours. All interviews were recorded on a digital

voice recorder and transcribed into a word processor. The interviews were conducted in the offices of the stakeholders. The goal of the interviews with the stakeholders was to inquire about their professional relationship with social housing providers and possible overlaps between their department and social housing or vice versa. The interview questions were catered according to each stakeholder by category: municipality, transportation authority or housing provider. The questions posed to the stakeholders could be summarized by the following categories (please see **Appendixes D and E** for a list of the interview questions with the stakeholders):

- Transportation (relationship with TransLink, data collection on transportation)
- Housing (relationship with housing providers, issues facing low-income families)
- Housing and transportation (links between social housing and transit, policies which mutually benefit housing and transportation)
- Data (monitoring use and demand, fares, parking)
- Route planning (type of research, data for SkyTrain and busses)

In addition to the 11 stakeholder interviews, an informal interview was conducted with a TransLink planner. This provided valuable background information to help understand decision-making processes of the agency and to identify agency policies, reports and other documents. However, information obtained from the interview has not been included in this report, and all references to TransLink are based exclusively on public documents made available by the agency. The sample size of 11 stakeholders included the following (in alphabetical order):

- Affordable Housing Societies (housing provider)
- BC Housing
- City of Burnaby
- City of Vancouver
- Metro Vancouver
- More Than a Roof (housing provider)
- New Vista Society (housing provider)
- Red Door Housing Society (housing provider)

- TransLink
- Victoria Transportation Policy Institute

## **5.4. Parking Data of Non-Study Sites**

Requests for parking data was extended to non-study social housing sites in Vancouver and Burnaby. This was done for the purpose of expanding upon the parking data obtained for Sites A, B, C and D. The limited scope of this study (4 social housing sites) did not provide enough information for the researcher to draw significant conclusions about car ownership in social housing.

Parking data is relevant because it impacts the overall affordability of a building and in turn, the rent paid by the household. Litman (2011b) noted that the parking requirements in zoning by-laws are typically generous and can harm the overall affordability of a housing project. One parking space per unit can increase costs by 12.5% (Litman, T. 2011b). According to Metro Vancouver's (2012) apartment parking study, a parking space can range from \$20,000 to \$45,000 per stall. Applying Litman's logic to social housing sites in Vancouver and Burnaby, are the existing parking requirements generous from the perspective of social housing sites? To answer this question, parking information was requested from all social housing sites, irrespective of their proximity to public transit. Phone calls were made to various social housing providers requesting three pieces of information. A total of 18 social housing sites responded to the following questions:

- Total number of units.
- Total number of parking spaces on site.
- Total number of residents who have registered for a parking spot.

## 5.5. Study Limitations

There were several limitations in this study and they are identified below. The limitations existed because they were not apparent at the time the methodology was created or a limitation was established to maintain the scope of this study.

The public transit scores developed by the researcher did not account for shortcuts such as dirt paths or trails. The scores were calculated based on sidewalks and/or roads that were identified on the digital maps. It is possible that some social housing sites may provide access to additional bus routes than were identified in this study. A similar limitation was also applied to the Network Connectivity Index. The Network Connectivity Index does not recognize informal routes or shortcuts created and/or frequented by pedestrians.

Although the housing continuum is wide, this study focused on families living in social housing only. Social housing sites were selected because they cater to a lower household income on the rental housing continuum. Co-operative housing was not included in this study because although it is a form of affordable housing, they tend to incorporate a wider mix of incomes. This is relevant because residents with higher incomes would have diluted the focus of the study which was low-income families. Although rent subsidies are available in co-operative housing, they are limited and waitlists for subsidized units can run from 4-5 years (The Co-operative Housing Federation of Canada, 2012). And finally, the requirement to purchase shares may be beyond the realm of affordability for some families.

It is important to note that the small sample size in this study (12 families) does not allow a generalization of each complex but instead, it offers a snapshot of the types and varieties of households that populate social housing sites in Vancouver and Burnaby.

Alimony payments were not mentioned or identified as income by single-parent interview participants. It is possible that child support payments were included when asked about their total income but none of the interview participants made this clear or

explicit. To the researcher's knowledge, all single-parents in this study appeared to be independent single parents.

## **5.6. Summary**

The methodology employed in this study was developed based on readily available data and the scope of the research question. The methodology was developed specifically for this study and to the author's knowledge; there are no housing or transportation studies that employed a similar quantitative research method involving the scores method mentioned in section 5.1. The following chapter will elaborate upon the findings which were obtained using the methods described above.

## **6. Site A: Poor bus service in Burnaby**

Site A is located in South Burnaby. The complex is administered by a non-profit society. The complex is composed of two, three and four-bedroom townhomes. Within those family units, there are a total of 207 individuals. The family households are a mix of single parents, coupled parents and children of all ages. Household sizes range as small as two and as large as seven. Almost all of the family households own cars. A very small minority (15% of families) do not own cars, 54% of the tenants own one car and the remaining 31% own two cars<sup>23</sup>. The complex contains mixed income.

### **6.1. Socio-Demographic Profile of Neighbourhood A**

The neighbourhood is composed primarily of single family dwellings and duplexes. The median age in the neighbourhood is 37.5 years of age. Half of the residents are adults (30-64 years of age) and a quarter is youth (0-19 years of age). More than half (66%) of neighbourhood residents own their dwellings and the average value of an owned dwelling is \$516,693. Three-quarters of families are married couples and the remaining quarter is primarily single parents. The median after-tax family income is \$52,522; the majority of those incomes are individual earnings. Less than 20% of residents are considered low-income. A little more than half of residents are immigrants.

<sup>23</sup> Source: Property Manager, personal records



Half of residents have a high school diploma or no education. The unemployment rate in the area was 4.8%. The majority of residents (66%) drive to work, less than a quarter take transit and less than 5% walk or bike to work<sup>24</sup>.

## 6.2. Transportation profile of Neighbourhood A

There are four separate bus stops within a 400 metre radius of the site. All bus stops are serviced by the one route. The bus travels between two separate SkyTrain stations. One bus stop provides a bench. During the weekday, the busses run between 5 a.m.-1 a.m. The busses arrive on average 1.8 times every hour. There is more bus service during the day (2.5 busses/hour) compared to the evening (1 bus/hour). There are service spikes between the hours of 3-6 p.m. During the weekend, the busses run from 6 a.m.-1 a.m. The weekend busses arrive on average 1.4 times every hour. There is more weekend bus service during the day (1.8 busses/hour) compared to the evening (0.7 bus/hour)<sup>25</sup>. Please see **Appendix G** for more information.

There are numerous services and facilities located within close proximity to the site including a wide variety of financial institutions, doctors, gas stations, grocery stores, restaurants and elementary schools. There are few options when it comes to libraries, hospitals and post-secondary institutions. One interview participant had health concerns which required frequent visits to the hospital. Her medical condition required numerous visits to various hospitals in the area. Her commute to her medical appointments ranged from 30 minutes to over an hour one way.

<sup>24</sup> All the above statistics were obtained from Statistics Canada. (2010c)

<sup>25</sup> TransLink, (2012c)

### 6.3. Site Visit

The proximity of two elementary schools is conducive to children walking to and from school. Human activity on the street is dependent on school hours – before school begins and after school lets out. The neighbourhood is clean and tidy, there are no visual obstructions but there are streets where sidewalks are missing. A nearby mall is accessed by a six lane car boulevard and the nearest pedestrian crosswalks are located 500 metres from one another; this distance prompts pedestrians to jaywalk.

The Network Connectivity Index score is 1.3 (35 nodes and 46 links) which means Site A is ranked as a suburban connection. Although it is ranked on the low end of the suburban scale, it is still considered as not very accessible. Please see **Figure 9** below for more information.

Figure 9: Site A Network Connectivity Index



There are numerous services and facilities located within a 2.5 km walk from Site A. Please see **Table 10** for more information.

Table 10: Services Located within a 2.5 km walk from Site A

<b>Service</b>	<b>Total</b>
Doctor	12
Financial institution	9
Restaurant	9
Gas station	8
Childcare facility	8
Spiritual	8
Independent grocery stores	6
Primary or post-secondary institution	5
Store	0 (see mall)
Mall	3
Large chain grocery stores	3
Park	2
Post-secondary institution	2
Walk-in clinic	2
Community centre	1
Veterinarian	1
Hospital	0

## 6.4. Profiles and Interviews

Despite the different incomes and transportation needs of the interview candidates, there were consistencies in their feedback about transit in the area. There are 2 bus route options in the neighbourhood. One bus is located 240 metres from the complex and runs every half hour. A second bus is located a kilometre from the complex and runs every 10 minutes. All interview participants expressed preference and were willing to walk the kilometre to the bus that ran more frequently. Interview candidates also expressed a desire to see stronger weekend transit services. They felt the existing services started running too late on weekends. All interview candidates also expressed a

desire for a weekend day pass similar to the Day Pass offered by the Toronto Transit Commission (TTC). The TTC offers a weekend day pass that permits a family<sup>26</sup> or 2 adults to travel the public transportation system from the start of service until 5:30 a.m. the next day for \$10.50.

The names of the residents have been changed to protect their privacy. Please see below for a snapshot of their lives and stories.

<sup>26</sup> Family could include a 1 adult and no more than 5 children/youth 19 years of age or under, 2 adults and no more than 4 children/youth

## PROFILE: ROSIE

Rosie lives at home with her husband and their two teenage children. Although Rosie withheld her family income, she noted that they can afford to purchase a home in Surrey. Although they own a car, the parents pay for 2 monthly passes and concession tickets. There is a very clear weighing of time, cost and convenience by Rosie. *“Even if we had 2 cars, we would still take the bus”* because it saves them time and is convenient.

Rosie and her husband ride the bus and SkyTrain to work everyday. They work 9-5 p.m. Monday-Friday. The children walk and/or take transit to school. Rosie appreciates the SkyTrain given its speed and predictability. The purpose of the car is to fill in the gaps left behind by transit. It facilitates errands on the weekends, allows her husband to pick her up after her night class and facilitates access to special destinations (temple, trails, special stores for ethnic ingredients).

As an immigrant, Rosie is of the opinion that there are poor transportation options for new arrivals. For example, the 90 minute ticket limit is too short and does not account for users who have to commute longer distances. She also feels public transit is inaccessible for those who work at odd hours. A third example, weekend service needs to be increased and should start running earlier. She is exhausted on the weekdays and groups her errands on the weekends. She would like to be able to complete her errands early in the day rather than catering her weekend to transit. And finally, Rosie recommended supplementary options outside of bus or SkyTrain such as cab sharing. Rosie feels unsafe riding the SkyTrain at night. She feels safer riding the bus at night. She feels reassured that the driver can protect her if something were to happen.

### PROFILE: ANDREA

Andrea is an unemployed single mother on disability. She is the sole parent of her daughter. Andrea's housing is subsidized and she pays 30% of her income for rent. Andrea cannot afford a car and is dependant on her subsidized annual bus pass. After she pays for her housing and transportation, Andrea is left with \$486 or 68% of her monthly income for items such as utilities, groceries, cellphone, entertainment, clothing and school field trips.

When asked if she could afford a monthly 3-zone transit pass (\$151) on her income, Andrea replied "*No, definitely not.*" Although Andrea is attracted to the idea of a car due given the freedom, she cannot afford it. Given her curious disposition and because she is a new resident, Andrea is eager to explore her new city but she finds this difficult to do with a transit pass given the size of the city and the planning required.

To save on transportation costs, Andrea and her daughter will walk rather than take the bus when they can. As a result, her daughter walks to school everyday (850m or 11 minute) and is expected to maintain this habit when she enters high school (1.2 km or 15 minute walk). But when it comes to trips such as visiting family or visiting one of her various doctors, Andrea has no choice but to take a combination of SkyTrain and bus transfers which can amount to a 1.5 hour trip one way.

As a former resident in a smaller community, Andrea is appreciative of the public transit service in her neighbourhood, more so than the other interview participants. Her only complaint is the bus drivers who give her a hard time due to her wheelchair. She feels that there is a lack of compassion and miscommunication among some of the drivers. Their inconsistent information leaves her confused.

### **PROFILE: PETER**

Peter is a young man living with his single mother. They have lived at the complex for more than 10 years. He works full-time in manufacturing.

Although they both own cars, Peter has pulled his car off the road in an effort to save money and out of respect for the environment. To make up for this, Peter borrows his mom's car or asks his friends to pick him up. Peter spends no more than \$45/month on public transit. Peter would like to bike to work but is fearful for his safety.

Peter's job requires him to work Mondays-Fridays in the afternoon and leave late at night. Peter estimates around 25% of people at his workplace work the night shift (10 p.m-6 a.m.) or afternoon shifts (2:30-10:30 p.m.). Although his work is a 20 minute drive away, it takes him 1.25 hours to get to work via two busses. His commute home after work is complicated by the fact that one of two busses he takes home only comes once an hour. If he misses it, he takes an alternative bus that adds a 15 minute walk to his already long commute home. When presented with a hypothetical situation, Peter was willing to travel as far as North Vancouver if the pay offset the transportation costs *"It's all strategic. You have to know what you want to give up and what you want to take."*

Peter identified obstacles he experienced from depending on transit: inconvenience, poor access to transit information for users who do not own smart phones, infrequent busses, peak hour routes which do not to reflect his work schedule, and lighting around SkyTrain stations.

### PROFILE: JANE

Jane lives at home with her husband and their three teenage daughters. They have lived at the complex for 6 years. Prior to being accepted into her existing social housing, the family lived in a 2-bedroom apartment in Metrotown. Jane works in Metrotown and her husband works downtown. Jane has a very strong aversion to transit given her previous unfavourable experiences with transit in her country of birth. The family's varying recreational and work schedules, and Jane's personal protective tendencies also serve as strong deterrents to transit.

The family's transportation costs are split between a car, one monthly 2-zone transit pass and student concession tickets. The family owns a second car but it remains in the garage. Mom and Dad share the bus pass. Jane noted the transportation costs are affordable to her family but *"If you don't manage your budget, you're going to spend a lot [on gas]."*

The children's perception of transit is shaped by their mother who insists on driving them everywhere. They prefer to be driven than taking transit.

Although Jane works part-time in retail, her career decisions revolve around her family. She is hesitant to apply for full-time work as that will not allow her to drive and pick-up her children from their various recreational commitments throughout the week. Jane and her husband communicate constantly about their schedules and transportation arrangement. If Jane is driving the van, dad is taking the bus. If dad is driving the van, Jane is taking the bus. The schedule is stressful because everyday is different.



## **7. Site B: Poor bus service in Vancouver**

Site B is located in South Vancouver. The complex is administered by a non-profit housing society. The complex is composed of two and three-bedroom townhomes. The complex contains a total of 43 family units. All units are 100% subsidized and there are no market rent units. Site B had the strongest representation of social housing units but it was also located in the poorest location compared to Sites A, C and D. More than half of the units own one car and less than 5% own more than one car. One third of residents do not own cars.

### **7.1. Socio-Demographic Profile of Neighbourhood B**

The neighbourhood is composed primarily of apartments (a range of walk-ups and higher density apartments), followed by single family dwellings and row housing. The median age in the neighbourhood is 39 years old. Half of the residents are adults (30-64 years of age) and a quarter is youth (0-19 years of age). 62% of residents own their dwellings and the average value of an owned dwelling is \$493,110. Three-quarters of families are married couples; the remaining 25% are a mix of common-law and single parents. Within the single-parents households, the majority of them are single mothers. The median after-tax family income is \$52,369. Common-law households earned more

than married households and single parent households. Single mothers also made more than single fathers. 20% of residents are considered low-income. Half of residents are immigrants. 3% of residents have a university degree and 30% have obtained an education beyond high school but not a university degree. The unemployment rate is 4.6%. A large majority of residents drive to work (70%), less than a quarter ride transit to work (17%) and the remaining 11% carpool, walk or bike to work<sup>27</sup>.

## **7.2. Transportation profile of Neighbourhood B**

There is one bus route located within a 400 m radius of Site B<sup>28</sup>. Initially, the bus stop was not considered to be located within 400 metre walking distance. This was amended to reflect that it did given the presence of a locked gate that was accessible to residents. There are few services and facilities in close proximity to the site. Almost all of the services are located 2.5-3km from the site. There are few options when it comes to banking institutions, grocery stores and walk-in clinics. One interview participant, a single mother, relied completely on public transit and will continue to do so as she does not have a driver's license. Her alternative is to walk when she can but the slopes and missing sidewalks make this difficult to do. She will carry the baby in a carrier but this means she purchases fewer items at the stores. She also expressed concern for her safety when walking home at night as one of the streets she frequents is nestled between two empty parcels. She tries to avoid the 850 metre walk at night and in the afternoons in the winter.

<sup>27</sup> All above statistics were obtained from Statistics Canada. (2010c)

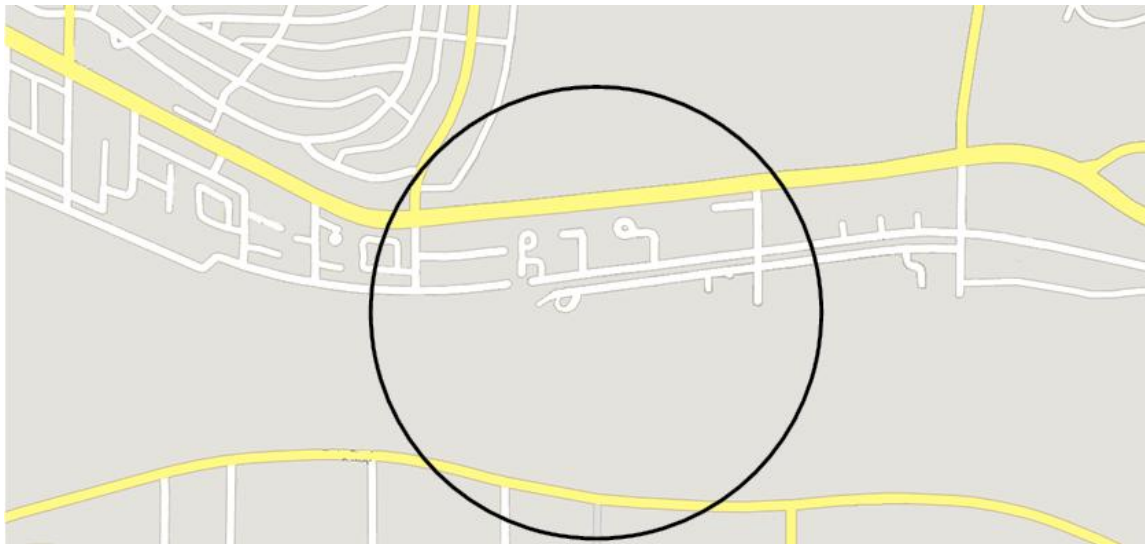
<sup>28</sup> TransLink, (2012c)

### 7.3. Site Visit

It is important to note the topographical challenges of Site C. The site is surrounded by steep slopes which may affect a resident's perception of distance and in turn discourage them from biking or walking. The site is not disability friendly. The property manager noted that residents with disabilities are hesitant to apply. The entrances to most of the units contain stairs to accommodate the slope of the site. One of the nearby streets does not provide sidewalks. A resident who frequents this street was concerned for her baby's safety because she was forced to walk on the street with the cars.

The Network Connectivity Index score is 1.05 (19 nodes and 20 links). Site B is ranked as a very suburban connection. Please see **Figure 10** below for more information.

Figure 10: Site B Network Connectivity Index



There are numerous services and facilities located within a 2.5 km walk from Site B. Please see **Table 11** for more information.

Table 11: Services Located within a 2.5 km walk from Site B

<b>Services</b>	<b>Total</b>
Restaurant	8
Doctor	7
Spiritual	6
Childcare facility	6
Park	5
Primary or post-secondary institution	4
Walk-in clinic	2
Community centre	2
Veterinarian	2
Large chain grocery stores	2
Financial institution	2
Hospital	2
Mall	1
Independent grocery stores	1
Gas station	1
Post-secondary institution	0
Store	0 (see mall)

## 7.4. Profiles and Interviews

The two residents who were interviewed at this site had drastically different transportation methods. One interview was a father of two on disability and not working at the time of the interview. Despite his low-income and his admittance that the car was unaffordable, he insisted driving was cheaper. The car also made life easier for his children (their respective schools are located a 20-30 minute walk away whereas it is a 5-10 minute drive by car). The car reinforced his sense of safety for his children (allowing him to pick them up after school, he was fearful of gangs and drugs and their influence on his children). The father places a high value in having a vehicle because it enables him to shop in the States (he does his grocery shopping in the States and stated that every trip benefits his family \$200-300 in savings). He expressed strong resentment towards transit and the people who ride transit.

The second interview was a single mother with two children, an infant and a teenage son. The mother was not working and did not own a driver's license. As a result, she and her son were very proficient in getting around by public transit. The mother knew the times of the bus routes, when they were amenable/not amenable to a stroller as well as the weekend and weekday bus schedules. Her shopping destinations were shaped by a store's prices; the store's aisle widths as it determined their ability to accommodate a stroller; and, proximity to transit. Given all these factors, the mother developed a comprehensive system and schedule which determined her commute patterns. As a result of the time required to care for her infant and the time-consuming nature of her commute schedule, her son is independent for his age and does not mind using transit services. It should be noted that both mother and son have different commute patterns: the mother commutes primarily in the suburban parts of Vancouver while her son commutes downtown for school and his social activities.

The names of the residents have been changed to protect their privacy. Please see below for a snapshot of their lives and stories.

### PROFILE: EDMOND

Edmond is a single parent with 2 children. He is an immigrant while his children are born in Canada. Edmond has resided at the complex for 7 months. A series of car accidents compromised his ability to work and he lost his house. Previously, he lived in a basement suite in Coquitlam.

Edmond owns a car and drives it every day. He pays a minimum of \$120/month on gas and because he has an older car, there are ongoing maintenance costs. Although it was not asked, it is possible his insurance rate has also gone up in light of the car accidents. Edmond admits the car is not affordable but he considers it a necessary sacrifice.

When Edmond returns to work, he says that location will be irrelevant. *“Work doesn’t matter. Work location is not your choice. You have to go wherever you find a job. Job location is not your choice.”* Edmond expressed frustration with the Canadian job market. Because he does not have an education beyond a high school diploma from his country of birth, he feels disadvantaged and vulnerable. He also suspects his age and lack of contacts are barriers to finding work *“If you don’t know anyone here, no one will take you. The culture here is different. If you’re a honest guy, you have a good resume and you know no one, no one will hire you.”*

Edmond is also critical of Translink’s fares; accusing them of raising fares every six months (this is false, Translink raised its fares from \$1.75 to \$2.50 over a period of 8 months 2000-2008). Edmond has no interest and desire to learn about public transportation. He exhibits a lack of awareness about the benefits of public transit and it would appear that he is pushing this attitude upon his children as well.

## PROFILE: MONA

Mona and her son arrived in Vancouver 3 years ago from another country. She lives at home with her teenage son and infant. Similar to Edmond, they have lived at the complex for 7 months. Prior to being accepted into their existing social housing, the family lived downtown and shared an apartment with another family. Mona cannot work at this time as her infant is too young for daycare.

Mona has experimented with different transit configurations in an effort to save money. Mona experimented with fare tickets and found that this impacted her window of opportunity to reach destinations in Burnaby and Richmond. Destinations beyond her zone were relegated to the weekend or after 6:30 p.m. on weekdays to avoid paying for 2 zones. She also became acutely aware of the 90 minute time limit imposed on each ticket. Most of her commutes were 20-40 minutes one way leaving her little time to take advantage of the 90-minute window. She has since decided that purchasing two monthly passes work best for her family.

When her infant was a newborn, Mona experienced great difficulty commuting to the doctors from her home. She has since switched over to the local walk-in clinic out of convenience and to save money.

In addition to the transit schedule, Mona's transportation is also determined by the needs of her infant. If the baby is crying, she will walk rather than take the bus *"I feel embarrassed to use the stroller because I don't want to make other people uncomfortable."* When asked about the impact of transit on her life Mona said *"It's more time consuming and I feel really isolated."* Mona also spends a considerable amount of time looking up the bus schedules before she leaves the house *"I need to use Translink every time I go out."*

## **8. Site C: Good bus service in Burnaby**

Site C is located in Northern Burnaby and is operated by a non-profit society. The complex is composed of two and three-bedroom townhomes. The complex contains a total of 21 family units. The building contains mixed-income. At the time of the study, 6 of the 21 households were receiving some form of subsidy. At the time of the study, the building was experiencing a change in management and was unable to provide the parking information.

### **8.1. Socio-Demographic Profile of Neighbourhood C**

The neighbourhood is composed primarily of single family dwellings and apartments greater than 5 storeys. The remaining third are composed of a mix of duplexes and smaller apartments. The median age in the neighbourhood is 42 years old. Half of the residents are adults (30-64 years of age) and the remaining half is split between youth (0-19 years of age), young adults (20-29 years of age) and seniors (65+ years of age). Young adults represented the smallest portion. More than half (61%) of residents own their dwellings and the average value of an owned dwelling was \$529,700. Three-quarters of families are married couples; the remaining 25% are an almost even mix of single parents and common-law households. Within the single parent families, 72% are single mothers. The median after-tax family income is \$56,685. Married households earned more than common-law and single-parent households. There was little difference between the incomes of single mothers and single fathers. A little more than a tenth (12%) of residents are considered low-income after tax. A third of residents are immigrants. A quarter of residents have a university degree, 30% of residents have obtained an education beyond high school but not a university degree. The unemployment rate is 6.9%. A little more than half of residents drive to work (66%),



almost a quarter ride transit to work (20%) and the remaining 12% carpool, walk or bike to work<sup>29</sup>.

## 8.2. Transportation profile of Neighbourhood C

The site is located 110 metres from a Frequent Transit Network. There are seven different bus routes located within a 400 metre radius of the site. During the weekday, the busses run between 5 a.m.-4 a.m. The busses arrive on average 2.2 times every hour. There is more bus service during the day (2.9 busses/hour) compared to the evening (1.4 busses/hour). There are service spikes between the hours of 6-10 a.m. and 3-6 p.m. During the weekend, the busses run from 6 a.m.-4 a.m. The weekend busses arrive on average 1.7 times every hour. There is more weekend bus service during the day (2 busses/hour) compared to the evening (1.2 busses/hour)<sup>30</sup>. Please see **Appendix G** for more information.

The busses travel to numerous destinations including: Metrotown, Capilano University, Simon Fraser University (both downtown and Burnaby campus'), three separate SkyTrain stations and a couple of bus loops in Vancouver. There are many services and facilities located within close proximity to the site. There is a generous variety of restaurants, shops, doctors, religious institutions and elementary schools.

<sup>29</sup> All above statistics were obtained from Statistics Canada. (2010c)

<sup>30</sup> TransLink, (2012c)

### 8.3. Site Visit

The site is located on a mild slope. Despite its proximity to a main street, the neighbourhood is quiet. The street is typical of many residential streets in that it provides street lighting, is landscaped with trees and there is ample opportunity for on-street parking (2 hour time limit). There are sidewalks on both sides of the street. When asked about safety at night, Chantel felt the neighbourhood was a relatively safe place. The nearby main road is busy at night and crimes are rare. Off the main road, the empty streets allow Chantel to peer ahead of her and formulate an exit strategy if she notices a suspicious individual. A block away (72m) is a main road which also happens to be the street where all of the busses excluding one route, can be accessed. Residents who wish to cross this road will experience difficulty given its width (spans approximately 31m in width) and lack of a crosswalk. Residents have to walk an extra block or 160 metres to the cross-streets where they can cross at a set of lights.

The Network Connectivity Index score is 1.5 (64 nodes and 96 links). Site C is ranked as a grid connection. Although it is ranked on the low end of the grid scale, it is still considered as very accessible. Please see **Figure 11** below for more information.

Figure 11: Site C Network Connectivity Index



There are numerous services and facilities located within a 2.5 km walk from Site C. Please see **Table 12** for more information.

Table 12: Services Located within a 2.5 km walk from Site C

<b>Services</b>	<b>Total</b>
Restaurant	19
Doctor	9
Financial institution	8
Spiritual	7
Childcare facility	6
Store	5
Primary or post-secondary institution	4
Veterinarian	4
Independent grocery stores	4
Park	3
Gas station	3
Community centre	3
Post-secondary institution	1
Large chain grocery stores	1
Walk-in clinic	0
Hospital	0
Mall	0

## 8.4. Similarities and Differences Between Sites A and C

Site A was matched with Site C. Both sites are located in Burnaby. Site A has poor bus access while Site C has strong bus access. The strongest similarities between both sites are the percentage of single parents in their neighbourhood (17%), percentage of households whose incomes are made up of government transfers (11%), renters (61% and 67%), owners (39% and 33%), family structures, education profile, labour force profile, the places of work and transportation to work. Some strong dissimilarities between Sites A and C include the percentage of duplexes (37% vs. 18%), apartments greater than 5 storeys (0% vs. 15%) and immigrant composition (54% vs. 36%).

## 8.5. Profiles and Interviews

Chantel is a single mother of a teenager. What is unique about her situation is her fluctuating income. Chantel has applied for a rent subsidy every year in the hopes of lowering her housing expenditures. She has been successful in retaining her subsidy excluding one year out of the nine years she has lived at the site. Her rent is dependent on the documents she provides and the housing provider's assessment. What is interesting about Chantel's situation is that although social housing is understood to be a secure form of housing, it also includes an element of insecurity by way of variable rents and policies such as the overhoused policy. Chantel is a strong advocate for public transit but maintains her opinions about it as well. She is knowledgeable of different bus routes and is aware of her choices through which she can reach her destinations. Chantel prefers routes which transport her to her destinations the fastest.

Simon is a father to three adult children. Despite living at a site with good bus access, Simon maintains very strong opinions about public transit. He possesses a strong dislike for bus riders and bus drivers *"the people on the bus they don't give their seats. They're young. The kids are holding onto the seats. And you know, come on! Get up man! There's an old lady!"* Simon elaborated that the lack of courtesy and manners exhibited on the bus is due to different cultures that are not conscious of protocol. When asked if his sentiments applied to the SkyTrain experience, Simon said *"different people ride the bus than the SkyTrain people...there's a lot of difference between those people and bus people."*

Judy was one of two interview participants who articulated her concerns about peak oil. The only other participant to do this was Peter (Site A). Judy and Peter are both adults in their early to mid-20s. Judy works hard to lead by example by refusing to drive gasoline-fuelled vehicles and encouraging her family to walk, bike and take transit.

*"We're teaching the kids how to ride their bikes. Just being independent of motor transport cause it is so expensive and it's so horrible for the environment. I hate how horrible it is for the environment. Especially after watching Who Killed the Electric Car. Gasoline has destroyed so much."*

The names of the residents have been changed to protect their privacy. Please see below for a snapshot of their lives and stories.

## PROFILE: CHANTEL

Chantel is a single mother of a teenager. She has lived at the site for 9 years but waited 5 years to get in. Prior to moving into the complex, Chantel lived in a one-bedroom with her daughter.

Chantel's income has varied throughout her tenancy. She has experienced working full-time to relying on Employment Insurance (EI). At the time of the interview, Chantel was unemployed. Prior to losing her job, Chantel was spending 21.7% of her income on rent. Chantel makes a conscious decision not to drive. She credits her upbringing in a large urban city as the reason why.

Despite Chantel's advocacy for public transit, she is not pleased with the service in her area. She finds the busses overcrowded, unreliable and is turned off by the lack of respect exhibited by some of the riders. Chantel will not ride the SkyTrain at night and prefers to ride the bus instead.

Her non-work commute destinations are all located within walking distance from home. She notes it takes her 3 hours to accomplish her errands. When meeting up with friends, they will either meet her at her home or pick her up with their car. When asked about her ideal commute time, Chantel said *"20 minutes is ideal by bus. That's a fair exchange of time in my life to get downtown."*

When asked about the importance of transit service on weekends, Chantel says *"We know it's slower and more challenging on weekends. But it's the only thing we've got. Cause it takes so long, there are a lot of things we don't do."*

## **PROFILE: JUDY**

Judy is a wife and mother to 2 children (5 and 7 years old). Judy and her husband have lived in social housing for the past 7 years and have lived at their current 2-bedroom home for the past 4 years. Four years ago, Judy's husband lost his job due to the recession and he has remained a stay-at-home dad ever since. Judy and her family possess very strong attitudes towards the petroleum industry and combat this by adopting a mixed methods approach to transportation which involve a motor-assisted cycle, SkyTrain, bus, carpooling, regular bikes and a bike chariot. Judy works 3 part-time positions and the nature of her work requires her to be able to commute to various municipalities within the region (Coquitlam, Richmond, North Vancouver and downtown). Judy will often drive her motor-assisted cycle to a SkyTrain station and complete her commute by public transit. Judy's family also use the cycle to complete errands, mainly shopping. For trips involving all members such as trips to Stanley Park, the family will take public transit. Judy noted that paying for the entire family to commute by public transit is getting expensive and they are considering alternatives such as a second motor-assisted cycle.

Judy possesses a strong dislike for the bus, her reasons being they have poor dependability and the homeless individuals who ride the bus without paying. She also expressed aversion to their body odour, lack of manners and intoxication. Judy feels unsafe in their presence. Judy and her husband do not possess driver's licenses. Although she is supportive of the idea of a car co-op, she will only buy into one if they support electric vehicles. Judy's schedule varies. She will often work 12 hours a day, 7 days a week.

## PROFILE: SIMON

Simon is a father of three adult children. He has lived at his current unit since 2007 with his wife and youngest daughter. Prior to 2007, Simon lived at the same complex but was living in a subsidized unit. In that time, Simon has experienced a wide range of incomes from working full-time to relying on social assistance.

Simon's wife is on disability and is unable to work. His youngest daughter commutes regularly by bus to post-secondary school and to work. Simon was unemployed at the time of the interview and has been for the past year. His EI payments were due to run out the following month after the interview. He lives in a market unit and has sustained his rent for the past year with social assistance. Simon is weary to request a rent review because policy would require him to move into a smaller unit. Simon regards his unemployment as temporary and is optimistic that this will change soon.

Simon chooses to drive a car because he is not fond of public transit and because his wife is unable to ride transit due to her disability. Simon's enthusiasm for the car extends to his children, he purchased a car for two of his children while they were in high school, cars which they continue to drive today.

After paying his expenses (rent, phone, internet, student loan, credit card bills), Simon says there is no money left. Simon would not be able to afford his existing car without the assistance of his adult children who are subsidizing most if not all his car costs. Simon says this arrangement is temporary. When asked if he would take public transit if a SkyTrain was located closer to his home, Simon agreed he would. "*Anything not to deal with drivers!*"



## **PROFILE: JOANNA**

Joanna is a single mother of three, her two adult children (aged 28 and 34) do not live with her but her teenage daughter (17 years old) does. Joanna has lived in her unit for the past 12 years. Prior to being accepted into Site C, Joanna was on BC Housing's waitlist for more than 10 years.

Joanna suffers from rheumatoid arthritis. The disorder has damaged her body and restricted her mobility to a cane and a walker. Her disorder affects her joints to the point where putting pressure with her hand on a cane is painful. She is prescribed various medications to accommodate her disorder. A recent operation now limits her mobility to a wheelchair.

Prior to her operation, Joanna's transportation options were a combination of the regular bus and HandyDART. Since she has been constrained to a wheelchair, riding the regular bus is no longer an option. Her complex is located on an incline and she is unable to descend the 100 metres on her own.

The HandyDART provides some independence for Joanna. And although the HandyDART has its advantages (drop off at her doorstep, sense of security and safety, her trips are not restricted to a 90-minute time limit). It also has its disadvantages. The strong demand for the service requires Joanna to call ahead and reserve her transportation from 3 days to a week ahead of time. The nature of the service prohibits spontaneous trips and extensions.

The majority of Joanna's HandyDART trips are to the doctor or the hospital. Joanna is unable to complete labour intensive errands such as grocery shopping; they are completed by her daughter, son or a friend. None of her family members or her friend own a car.

## **9. Site D: Good bus service in Vancouver**

Site D is located the East Vancouver. The building is operated by a non-profit society. The complex is an apartment building composed of 24 family units. The building contains mixed income. At the time of the study, 80% of the units were rented at market rate. Of the two interview participants, one was paying non-market rent and the other household was paying market rate. A little more than half (62%) of residents own a car.

### **9.1. Socio-Demographic Profile of Neighbourhood D**

The neighbourhood is composed of a mix of single family dwellings, apartments greater than 5 storeys and apartments lower than 5 storeys. The median age in the neighbourhood is 38.3 years old. Half of the residents are adults (30-64 years of age) and the remaining half is split between youth (0-19 years of age), young adults (20-29) and seniors (65+ years of age). Seniors represented the smallest portion. A little more than half (55%) of residents owned their dwellings and the average value of an owned dwelling was \$543,295. A little more than half of families are married couples; the remaining 40% is split evenly between common-law and single parents. Within the single parent households, 84% are single mothers. The median after-tax family income is \$52,714. Married households (\$57,698) earned more than common-law (\$53,291) and

single-parent households (\$35,685). Single fathers (\$37,727) earned slightly more than single mothers (\$35,640). 17% of residents are considered low-income after tax. More than a quarter (38%) of residents are immigrants. A third of residents have a university degree, 21.8% of residents have obtained an education beyond high school but not a university degree. The unemployment rate is 4.8%<sup>31</sup>.

## 9.2. Transportation profile of Neighbourhood D

The site is located 100 metres from a Frequent Transit Network. There are seven different bus routes located within a 400 metre radius of the site. During the weekday, the busses run between 5 a.m.-4 a.m. The busses arrive on average 1.3 times every hour. There is more bus service during the day (1.8 busses/hour) compared to the evening (0.7 busses/hour). There are service spikes between the hours of 7-9 a.m. and 4-7 p.m. On weekends, the busses run from 6 a.m.-4 a.m. The weekend busses arrive on average 1.1 times every hour. There is more weekend bus service during the day (1.5 busses/hour) compared to the evening (0.5 busses/hour)<sup>32</sup>. Please see **Appendix G** for more information.

A little less than half of residents drive to work (46%), almost a quarter ride transit to work (24%) and the remaining 60% carpool, walk or bike to work. The busses travel to numerous destinations including: UBC, the PNE, 2 SkyTrain stations, a low-density bus loop, various destinations in North Vancouver and downtown Vancouver.

<sup>31</sup> All above statistics were obtained from Statistics Canada. (2010c)

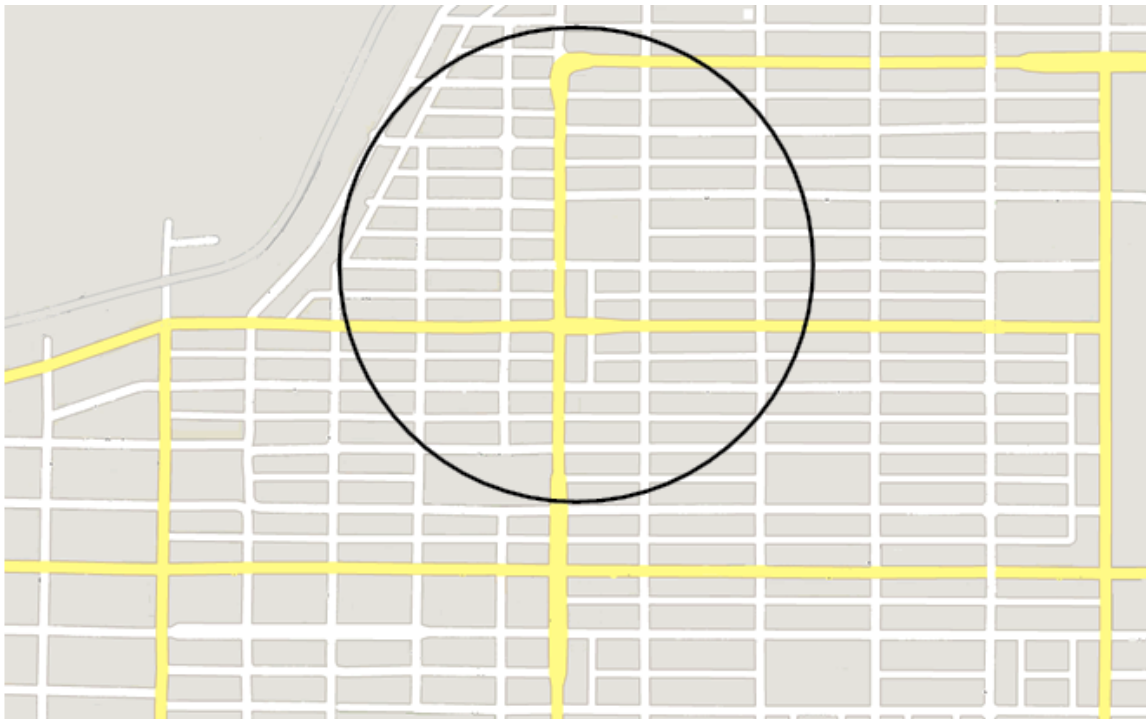
<sup>32</sup> TransLink, (2012c)

### 9.3. Site Visit

There is an intersection nearby that allows access to other bus stops and bus routes. The intersection is very busy and is modified to accommodate the high volume of trucks and cars. The crosswalk can only be crossed from three sides. Alexandra expressed discomfort about the crosswalk preferring to walk through the smaller streets rather than crossing that intersection. When asked about safety, Alexandra said she felt safe during the day. Having grown up here, the neighbourhood feels like home. Alexandra does not like taking the bus at night. She is not a fan of one of the nearby bus stops because it is poorly lit and the shelter is dark.

The Network Connectivity Index score is 1.5 (53 nodes and 84 links). Site D is ranked as a grid connection. Although it is ranked on the low end of the grid scale, it is still considered as very accessible. Please see **Figure 12** below for more information.

Figure 12: Site D Network Connectivity Index



There are numerous services and facilities located within a 2.5 km walk from site D. Please see **Table 13** for more information.

Table 13: Services Located within a 2.5 km walk from Site D

<b>Services</b>	<b>Total</b>
Doctor	11
Independent grocery stores	10
Restaurant	9
Financial institution	7
Spiritual	7
Childcare facility	6
Store	6
Gas station	4
Primary or post-secondary institution	3
Park	3
Walk-in clinic	3
Community centre	2
Veterinarian	1
Post-secondary institution	1
Large chain grocery stores	0
Hospital	0
Mall	0

#### **9.4. Similarities and Differences Between Sites B and D**

Site B was matched with Site D. Both sites are located in Vancouver. Site B has poor bus access while Site D has strong bus access. The strongest similarities between both sites are the adult and senior age groups (adults 60-64 years of age composed 52% and 53% of their populations), percentage of dwellings that were composed of single detached dwellings (27% and 28%), percentage of households whose incomes are made up of government transfers (9% and 10%), percentage of individuals with low-incomes before tax (24% and 23%), average household size (2.4 and 2.5); and, similar education profiles and similar labour force profiles. Some strong dissimilarities between Sites B and D include duplex dwellings (9% vs. 39%), percentage of single parents who are single mothers (12% vs. 84%), immigrant makeup (51% vs. 39%), active transportation to get to work (3% vs. 20%)

## 9.5. Profiles and Interviews

When asked what she looks for in a neighbourhood, Christine replied “*Accessible transit, that would be number one...[without transit] I couldn't get around, it would take away my independence, ability to volunteer, my sanity, quality of life.*”

The names of the residents have been changed to protect their privacy. Please see below for a snapshot of their lives and stories.

### PROFILE: ALEXANDRA

Alexandra is an Aboriginal single mother of three young children. Her family has lived in their current home for the last year and a half. Previously, the family have lived in Surrey and Burnaby. Alexandra qualifies for the disability transit discount. Two of her children are young enough to ride transit at no cost. She pays for her eldest's transportation with tickets and purchases approximately 10 tickets a week.

The children are enrolled in counselling and attend appointments every week. For leisure, the family enjoys SkyTrain rides and bus trips to the North Shore. Alexandra rides four different bus routes throughout the week. *"The busses here usually take us wherever we need to go."* For groceries, Alexandra frequents a large chain located a 30-minute bus ride away once a month. Given the volume of groceries she purchases, she will hail a cab for the return trip. The taxi fare costs \$14.

When asked about transit in the area, Alexandra does not have strong opinions about transit and is happy overall but wished one route would run more often. When asked about future employment, Alexandra said she would look for part-time work that was located no more than 30 minutes by bus. When asked about what she looks for in a neighbourhood, Alexandra said *"schools and transit would be the most important."*

When asked about her experiences riding transit with three young children, Alexandra recalled instances when people complained about her stroller because it took up too much space (her daughter could not walk at the time). *"If you don't like to be in the public you should just stay home."* The weather impacts Alexandra's transportation options. She would rather walk in the summer and avoids going out when it rains.

## PROFILE: CHRISTINE

Christine is the wife in a family of four. She is mother to an infant and a young child. Christine is on disability and experiences balance and memory issues, which impact her ability to navigate stairs and she becomes disoriented when her routine is disrupted. The father has gone back to school and was recently hired for a part-time position on weekends. The family have lived at their current home for the past year and a half.

In terms of transportation costs, the children are young enough they can ride transit for free and the parents' passes are subsidized by the UPass and Disability pass. The family are also members of a car co-op although they have not taken out a car in a long time. Her mother-in-law lends her car when the family goes shopping.

When asked about her experiences taking the bus as a rider with a disability, Christine recalls *"If I'm having a really bad balance day, I need to sit down. Usually I have to boot someone out. I will ask people to move if they don't move."* When asked about her experiences with the stroller *"When I get on with the stroller, some of them get angry that they have to get up."* Although disability benefits are understood to be a secure form of income, it also includes an element of insecurity by way of variable household incomes. A few years ago, Christine and her husband were employed and their combined incomes exceeded the criteria to qualify for disability. Her benefits such as her disability pass were withdrawn and her family found it difficult to get by on their combined incomes.

Christine's daycare charges \$900/month. Christine pays \$300/month thanks to a subsidy. Daycare costs consume 23% of her income.



## **10. Study Findings**

In response to the study question (how do social housing locations impact public transit use among low-income families in Vancouver and Burnaby?), the study findings indicate that the answer to this question is complex. To begin addressing the research question, the study findings have been organized by topic. The first section (Sections 11.1 and 11.2) will speak to the findings obtained for each site regarding travel behaviour, transportation and housing expenditures. The second section (Sections 11.3, 11.4, 11.5 and 11.6) will address how social housing locations encourage or discourage public transportation use, car ownership and how these factors influence the transportation behaviours of children. The third section will address how family structures impact transportation needs (Section 11.7). The fourth and final section will narrate the experiences and challenges of the families by theme: disability, mother with a stroller and gender (Section 11.8).

### **10.1. Travel Behaviour**

Interview participants were asked questions that covered 6 key topics: the family (# of members, age), financial (income, housing and transportation expenditures), commute to work (destination, length, time, mode), non-work commutes (destination, length, time, mode), safety; and, experiences with transit. The results from the interviews are compiled into topics below.

A resident's mode of transportation to work was determined by their work location. The majority of employed residents worked in downtown Vancouver, other work locations included Metrotown, Richmond, Fairview and Dunbar neighbourhoods; and, one individual travelled extensively within the lower mainland. Eight families contained at least one adult member who was not working. They were not working because they

were caring for an infant, they had a disability and/or they were actively looking for work but were not working at the time of the interview. Some residents had the option of taking either the SkyTrain or the bus to their place of employment. All interview participants preferred the SkyTrain because of its reliability and frequency. The average work commute time of study participants (including spouses and/or children who were working) was 39.5 minutes. None of the residents interviewed were within walking distance to work. Please see **Table 14** below for more information.

Table 14: Work Destinations and Modes

	<b>WORK DESTINATIONS</b>	<b>TIME</b>	<b>MODE</b>
<b>SITE A - Poor Bus Access</b>			<b>Location: South Burnaby</b>
Family #1	Not working	Not applicable	Not applicable
Family #2	Downtown Vancouver	40 minutes	Public Transit
	Downtown Vancouver	40 minutes	Public Transit
Family #3	Richmond	1.25 hours	Public Transit
	Fairview neighbourhood	30 minutes	Car
Family #4	Metrotown	15 minutes	Car
	Downtown Vancouver	40 minutes	Public Transit
<b>SITE B - Poor Bus Access</b>			<b>Location: South Vancouver</b>
Family #5	Not working	Not applicable	Not applicable
Family #6	Not working	Not applicable	Not applicable
<b>SITE C – Good Bus Access</b>			<b>Location: North Burnaby</b>
Family #7	Not working	Not applicable	Not applicable
Family #8	Not working	Not applicable	Not applicable
Family #9	Fairview	20 minutes	Motor-assisted cycle
	Coquitlam	1 hour	Public Transit & carpool
	Dunbar	30 minutes	Motor-assisted cycle
	Richmond	45 minutes	Motor-assisted cycle & public transit
Family #10	Not working	Not applicable	Not applicable
<b>SITE D – Good Bus Access</b>			<b>Location: East Vancouver</b>
Family #11	Not working	Not applicable	Not applicable
Family #12	Not working	Not applicable	Not applicable
	Downtown Vancouver	30 minutes	Public Transit

Non-work destinations tend to be closer to home and within walking distance. For some residents, it took a little longer to reach their destinations due to a disability or the presence of a baby stroller. Family households from Sites A and B were more likely to use their cars for non-work destinations while almost all family members (excluding

family #8) from Sites C and D did not use their car at all. Please see **Table 15** below for more information.

Table 15: Non-Work Destinations and Modes

<b>NON-WORK &amp; NON SCHOOL DESTINATIONS</b>		<b>TIME</b>	<b>MODE</b>
<b>SITE A - Poor Bus Access</b>		<b>Location: South Burnaby</b>	
Family #1	Kitsilano	1.50 hours	Public Transit
	Vancouver Hospital	1.50 hours	Public Transit
	Burnaby General Hospital	1 hour	Public Transit
	Royal Columbian	30 minutes	Public Transit
	Metrotown Mall	41 minutes	Public Transit
	Public Library	30 minutes	Walk
	Save On Groceries	30 minutes	Walk
	Pool	17 minutes	Walk
Family #2	Temple	30 minutes	Car
	Surrey	15-30 minutes	Car
	Burnaby Mountain	20 minutes	Car
	Vancouver Community College	1 hour	PT and car
	Kin's Market	11 minutes	Car
	Mall	8 minutes	Car
	Children's Sports	10-12 minutes	Car
Family #3	Gym	30 minutes	Public Transit
	Friend's Homes	various	Public Transit
	Chiliwack	1 hour	Car
	Mall #1	30 minutes	Car
	Mall #2	8 minutes	Car
Family #4	Metrotown Mall	15 minutes	Car
	Children's Sports	Various	Car
	Church	8 minutes	Car
	Favourite Restaurant	20 minutes	Car
<b>SITE B - Poor Bus Access</b>		<b>Location: South Vancouver</b>	
Family #5	Mall #1	45 minutes	Public Transit
	Value Village	30 minutes	Public Transit
	Superstore	40 minutes	Public Transit
	Walk-in clinic	40 minutes	Public Transit
	Mall #2	30 minutes	Public Transit
	Richmond	45 minutes	Public Transit
	Faith	40 minutes	Public Transit
Family #6	Bellingham, US	1 hour	Car
	Superstore	16 minutes	Car
	Costco	15 minutes	Car
<b>SITE C- Good Bus Access</b>		<b>Location: North Burnaby</b>	
Family #7	Mall	16 minutes	Public Transit
	Parks	10 minutes	Walk
	Safeway	20 minutes	Walk
	Library	20 minutes	Walk
Family #8	Interviews	Various	Car
	Meet with peer	-	Walk
Family #9	Park	6-10 minutes	Walk/Bike
	Library	10 minutes	Bike
	Doctor	10 minutes	Walk/Bike
	Safeway	5 minutes	Cycle

	Superstore	10 minutes	Cycle
Family #10	Hospital	30 minutes	Public Transit
	Metrotown	20 minutes	Public Transit
<b>SITE D– Good Bus Access</b>		<b>Location: East Vancouver</b>	
Family #11	North Vancouver	40 minutes	Public Transit
	Appointments	45 minutes	Public Transit
	Community Centre	5 minutes	Walk
	Drugstore	11 minutes	Walk
	Dentist	20 minutes	Public Transit
	Superstore	30 minutes	Public Transit
Family #12	Safeway	30 minutes	Public Transit
	Superstore	26 minutes	Public Transit
	Volunteer	52 minutes	Public Transit
	Faith	40 minutes	Public Transit
	Downtown Vancouver Library	30 minutes	Public Transit
	Renfrew Library	23 minutes	Public Transit

## 10.2. Transportation and Housing Expenditures

When asked about housing expenditures, one resident was paying less than 30% of their income on housing, three residents were paying 30-49% of their income on housing and six residents were paying 50% or more of their income on housing. Three of the residents who were interviewed had experienced job loss within the past year and their housing expenditures may reflect the household paying market rent with a low-income.

When asked about transportation expenditures, three residents were paying less than 45% of their income on housing and transportation, and six residents were paying more than 45% of their income on housing and transportation. Inclusive of all children and parents in this study, there were a total of 38 individuals. Of those 38, half of them qualified for and used a transportation discount in their household (this includes children under the age of 4). Please see **Table 16** for more information. The majority of the total (32 of 38) rode public transit either to travel to work, to travel to non-work destinations or both.

Table 16: Individual Housing and Transportation Expenditures as a Percentage of their Monthly Income

	HOUSING	TRANSPORTATION	TOTAL
Site A, resident #1	\$210 or 30%	\$53.75 or 7%	37%
Site A, resident #2	n/a	\$422	n/a
Site A, resident #3	\$900 or 27%	\$695 or 20%	47%
Site A, resident #4	n/a	\$612.50 or 10%	n/a
Site B, resident #1	\$565 or 56%	\$127 or 12%	68%
Site B, resident #2	\$557 or 55%	\$300 or 30%	85%
Site C, resident #1	55%	2.1%	57%
Site C, resident #2	\$1,355 or 62%	Paid for	62%
Site C, resident #3	\$385 or 30%	Less than \$20 or 1.5%	31.5%
Site C, resident #4	50%	\$50	n/a
Site D, resident #1	\$500 or 30%	\$84 or 5.6%	35.6%
Site D, resident #2	\$915 or 70%	\$33.75 or 2.5%	72.5%

The information in **Table 16** above demonstrates that residents living in sites with poor bus access tend to spend more of their income on transportation compared to those living in proximity to stronger bus access. Residents from Sites A and B (poor bus access) spent between 7-30% of their income on transportation while residents from Sites C and D spent between 1.5-5.6%. Four of the five households who owned cars were located in sites with poor bus access.

The above data suggests that poor access to bus access creates negative financial repercussions for a low-income family. Residents who lived in sites with poor bus access were more likely to own a car. In the cases where families owned a personal vehicle, the car limited their total disposable income. This limitation also impacts their capacity to become independent of income assistance and/or social housing since they are spending more of their income on housing and transportation costs.

### 10.3. Location

The results in this study suggest a home's proximity to a frequent public transit service impacts the household's likelihood of relying on a personal vehicle.

Walker (2011) suggested that areas with higher densities benefit from better sidewalks and more lighting. Walker’s hypothesis applies to the sites identified with poor public transit (Sites A and B). Nearby streets to Sites A and B were missing sidewalks and a street near Site B did not have lighting.

The built environment of each neighbourhood appeared to impact the public transit service delivery. The sites with poor bus service (Sites A and B) did not have high street connectivity and were more likely to discourage walking. A grid street network, high density and variable land use are seen as beneficial and amenable to public transportation. The Transportation Research Board (1996) suggests that transit ridership is related to density. This hypothesis applies to this study as most of the car owners in this study lived at sites with low densities; and, poor bus access and frequencies.

## 10.4. Cars and Parking

Three of the four sites used in this study contained a mix of market and subsidized units. Some of the residents in the sites below drove more than one car although they were often a minority rather than the majority. On average, a little less than three-quarters (69.5%) of residents in the study sites drove a car (excluding Site C). Please see **Table 17** for more information.

Table 17: Parking Data for Study Sites

	SITE TYPE	% OF RESIDENTS USE PARKING	RENT TYPE
Site A	Poor SkyTrain	83.5%	Market and non-market mix
Site B	Poor Bus	62.7%	100% RGI
Site C	Poor SkyTrain	n/a	Market and non-market mix
Site D	Good Bus	62.5%	Market and non-market mix

Source: various non-profit housing organizations

Car ownership data was also assembled for non-study sites. Sites that contained a mix of different rents were more likely to have stronger car ownership than sites that were limited to RGI. More than three-quarters (85.5%) of tenants in mixed rent buildings drove cars compared to a little more than half (59.8%) in the RGI buildings. Within the

non-study sites, only 3 sites had a 100% parking rate which suggests that there is an oversupply of parking. On average, almost three-quarters (72%) of residents in the study sites drove a car. The parking data collected for the study sites and non-study sites suggest that car ownership rates are higher in mixed housing. Car ownership rates tended to remain the same (55-56%) for RGI buildings regardless of whether they were located in sites with poor bus access or sites with good bus access. Please see **Table 18** for more information.

Table 18: Parking Data for Non-Study Sites

SITE TYPE		% RESIDENTS USE PARKING	RENT TYPE
Site E	Good Bus Good SkyTrain	56%	Market and non-market mix
Site F		95%	100% RGI
Site G		100%	Market and non-market mix
Site H	Good Bus Poor SkyTrain	38.2% (limited parking)	100% RGI
Site I		41.9%	100% RGI
Site J		52%	Market and non-market mix
Site K		62.7%	100% RGI
Site L		66.6%	100% RGI
Site M		70.9%	100% RGI
Site N		98%	Market and non-market mix
Site O		100%	Market and non-market mix
Site P	Poor Bus Poor SkyTrain	31.3%	100% RGI
Site Q		60%	100% RGI
Site R		72.2%	Market and non-market mix
Site S		72.3%	100% RGI
Site T		93.4%	Market and non-market mix
Site U		98.6%	Market and non-market mix
Site V		100%	Market and non-market mix

Source: various non-profit housing organizations

## 10.5. Transportation Behaviours of Children

It should be noted that the researcher did not speak to or obtain this information directly from the children (excluding one adult child). This information was relayed indirectly through the parents. Sites A and B are located in poor bus locations and this is made apparent by the methods of transportation exhibited by the children. The children who did not walk/bike in Site D were not at an age where they could walk independently.

Please see **Table 19** below for information about the transportation behaviours of the children of the study participants.

Table 19: Transportation Behaviours of Study Participant's Children

SITE	AGE	WALK/BIKE	PUBLIC TRANSIT	CAR
<b>SITE A - Poor Bus Access</b>		<b>Location: South Burnaby</b>		
Female	11	School	Errands with parent	
Female	12	School		Non-school trips Extracurricular activities
Female	14		School Mall Weekend pleasure trips	School (raining) Extracurricular activities
Female	15		School Mall Weekend pleasure trips	School (raining) Extracurricular activities
Female	15		School	School Non-school trips Extracurricular activities
Female	16		School Mall Weekend pleasure trips	School (raining) Extracurricular activities
Male	23	Meet with peers	Work	Car in garage during winter Carpool with friend
<b>SITE B - Poor Bus Access</b>		<b>Location: South Vancouver</b>		
Female	< 1		Errands with parent	
Female	8			School
Male	15		School Meet with peers	
Male	15			School
<b>SITE C - Good Bus Access</b>		<b>Location: North Burnaby</b>		
Male	5	School Library Doctor Park	Park Leisure family trips	
Female	8	School Library Doctor Park	Park Leisure family trips	
Female	13	School Meet with peers Extracurricular activities		
Female	17	n/a	n/a	n/a
Female	21		School Work	Work (taxi)
<b>SITE D - Good Bus Access</b>		<b>Location: East Vancouver</b>		



Male	< 1		Errands with parent	Errands (car co-op or borrow)
Female	2		School	Errands (car co-op or borrow)
Female	3	Errands with parent	Errands with parent Appointments Weekend pleasure trips	Errands with parent (taxi)
Female	4	Errands with parent	Errands with parent Appointments Weekend pleasure trips	School (bus) Errands with parent (taxi)
Female	8	School Errands with parent	Errands with parent Appointments Weekend pleasure trips	Errands with parent (taxi)

## 10.6. Compensating Public Transit through Car Ownership

The interviews with the residents determined that some of them drive a car to fill in the gaps where public transit is lacking. A number of households drove cars and were also regular riders of public transit. Jane (Site A), Rosie (Site A) and Peter (Site A) compensated the public transit with their car(s). In the case of Jane (Site A) and Peter (Site A), they worked odd hours which were not compatible with public transit's hours of operation. Similar to Jane and Peter, Judy's (Site C) work hours are also unconventional and she compensated with a motor-assisted cycle.

In some cases, the car was used to fill in gaps where transit is lacking or for purpose trips which were not suitable for transit. Jane (Site A), Rosie (Site A), Peter (Site A), Edmond (Site B), Simon (Site C) and Judy (Site C) used their cars for non-work tasks such as groceries, destinations which are not convenient by public transit and to carry many people at the same time (this was the case in larger families).

## 10.7. Family Structures Impact Transportation Needs

The relationship between family structure and transportation is intricate. This study did not focus on their interactions but they were relevant to the participants in the study. The majority of the families had one or more children who were not old enough to commute independently. The age of the children, the number of children and the number of parents had a heavy hand in influencing transportation behaviours.

**Single-parent vs. two-parent household.** Single parents experienced greater challenges when it came to transporting their children, especially if they lived in an area with poor bus access. Edmond (Site B) and Rosie (Site A) both have two children, a teenager and a young child. Both households own one car. Edmond is a single father who is not working while Rosie parents her children with her husband, both are employed. Edmond lives in an area with challenging topography, no school bus service, poor public transit choice and infrequent public transit access. These elements contribute to Edmond relying more strongly on his car (and thereby incurring more costs) compared to Rosie's household. The main drawback was income. Edmond was spending \$300 a month on transportation, and while Rosie was spending \$422, this cost was split between her and her husband. In his interview, Edmond repeatedly brought attention to increasing gas prices while gas prices had less of an influence on Rosie. The obstacles in Edmond's life at the time of the interview differed greatly from Rosie's. Edmond was not working, on disability and spending 85% of his income on rent and transportation. Rosie's concerns at the time of the interview included saving up for home ownership in a desirable neighbourhood, deciding on a post-secondary institution for her eldest, finding a job that is more fulfilling than her current one and traveling.

**Age of children.** Younger children demand more attention from their parents. Depending on their age, they may be immobile and dependant on their mother and/or father for all/some of their basic needs. Alexandra (Site D) and Jane (Site A) are both mothers to three children. Alexandra is a mother to three children between the ages of 3-8 and Jane is a mother to three children between the ages of 14-16. Alexandra lives in an area with good bus access while Jane lives in an area with poor bus access. Alexandra's children are very young and even though two of Alexandra's children attend school and extracurricular programs across the street, they are not old enough to walk unsupervised. Jane's children take public transit to their respective schools and the mall to meet with their peers. Although Jane insists on driving her children more than other families who live in the same complex, the time required to fulfill her children's transportation needs are far less than Alexandra's.

**Number of children.** The average expense to raise a child to 19 years of age in Canada is \$191,665<sup>33</sup>. Having more than one child will increase a household's expenses. Alexandra (Site D) and Jane (Site A) are mothers to three children while Andrea (Site A) and Chantel (Site C) are mothers to one child. According to the United States Department of Agriculture Cost of Raising a Child calculator<sup>34</sup>, Alexandra and Jane can expect to spend between \$18,753-\$22,511 on their children annually while Andrea and Chantel will spend between \$11,262-\$11,778 this year. The annual difference ranges between \$7,491-\$10,733 or \$142,329-\$203,927 over 19 years of age. The increased expenses are significant among low-income households and limits their transportation options, especially if they have a low-income and if they live in an area with poor bus access. Poor public transit access may force a household to choose between getting around and other basic necessities (shelter, food, clothing).

**Disability.** Families that contained a member with a disability had to amend their transportation needs accordingly. Andrea (Site A), Edmond (Site B), Simon (Site C), Joanna (Site C), Alexandra (Site D) and Christine (Site D) were all families that contained a family member who was on disability and was not working. The reasons for their unemployment ranged from the disability prevented their ability to work, caring for a baby or young child(ren), actively looking for work but experiencing difficulty finding work or medical appointments which conflicted with work hours.

Joanna's disability limits recreational trips with her daughter to areas which are wheelchair friendly and accessible to the HandyDART bus service, such as the mall. Andrea's wheelchair does not allow her to visit areas with steep slopes without an

<sup>33</sup> Minicucci, D. (2011, June 10)

<sup>34</sup> United States Department of Agriculture. (date not available)

attendant. Although Andrea is fortunate to have her young daughter assist her, there may be times when she is not strong enough to push her mother up certain streets. Christine's disability limits her destinations to areas without stairs or areas with an elevator.

## **10.8. Experiences Taking Transit**

The transit experiences of interviews participants varied by individual although themes can be drawn from those experiences. Different characteristics such as gender or the presence of a disability culminate into a transit experience that is unique to the rider. The following sections will present the different transit experiences by theme. They are: riding public transit with a disability, riding public transit with a stroller and gender.

### ***10.8.1. From the Perspective of a Rider with a Disability***

Of the 12 interview participants, 9 were mothers with children under the age of 18. Four of those mothers were on disability. Their disabilities ranged from hidden (balance, memory, pain receptors) to highly visible (wheelchair, walker). The interview with Christine from Site D was an opportunity to inquire about the challenges of riding transit from the perspective of a rider with a hidden disability and a stroller. Christine's disability is not visible in the sense that she does not require a cane, a seeing-eye dog or a wheelchair. She requires a walker on bad days but this is not often. Christine experiences difficulties with orientation. Recent renovations in the SkyTrain stations have limited the availability of elevators. Christine expressed frustration about the lack of notice to riders such as herself, who do not have access to a smart phone. She feels penalized for not owning a smartphone (she cannot afford one). Christine's disability makes it difficult for her to stand on a moving bus and she has to sit. She expressed her frustration at able-bodied riders who occupy the priority seating. Her requests in asking them to move have been met with disdain, especially from younger riders who may not be aware of the rules governing priority seating. Her memory disability also impacts her ability to get around as she explains below:

*“With all the construction going on downtown...they reroute some of them and so that throws me off a little. My memory’s not great and I have a hard time navigating a route if it’s been rerouted or if it looks different. If I get used to a route I know which bus to get on and which bus to get off. I remember a place to get off in front of. When they go down another street it totally throws me off even if it’s only a block over, I get disoriented.”*

Andrea from Site A had a different experience with riders from the perspective of a rider in a wheelchair. The configuration of the handicap seating on the bus places Andrea in a direction where she rides with her back to the driver and sits facing the riders near the priority seating *“People feel like they have to talk to me or they should talk to me. I’ve had all sorts of experiences. Really rude and really nice...I think when you’re not around somebody who’s in a chair, your questions come up.”* Her frustrations with the public transit system stem from her interactions with the bus drivers:

*“It just seems like each bus driver has different rules to what goes on in their bus which gets frustrating for me cause then I don’t know what’s going on. And I don’t want to argue with anybody but each time I hear something different I think well ok the last one said this...so what’s the right answer?”*

Joanna’s (Site A) disability eliminates walking and the regular bus from her transportation options. She relies on the HandyDART for all her transportation needs for trips as far as Vancouver or as close as two city blocks. Joanna illustrated the difficulty of traveling her neighbourhood by herself in her wheelchair and why she chooses to remain indoors:

*“Three weeks ago I almost had accident because I was coming from that way [downhill] and I came here really fast. I tried to stop but [I rolled] in[to] the street. There was a couple people, they helped me to come here. That’s why I don’t go outside so much because this part, especially this part here is more dangerous, you go down.”*

The strong demand for the service is evident given that Joanna has to reserve the HandyDART up to a week in advance at times. Joanna had favourable comments when asked about the HandyDART service *“They [the drivers] open the door for me,*

*they bring me here to be safe. It's easy..the HandyDART in this moment is the best thing I can have."*

Chantel does not have a disability but she experiences back pain which disagrees with the bus seats:

*"In front of the busses, they're the worst seats cause they're on a 90 degree angle, I have to sit sideways. There's no support for the lower back. They fold up but there's no back support."*

### **10.8.2. From the Perspective of a Mother with a Stroller**

The interview with Alexandra from Site D provided a snapshot of what it was like to travel with three young children under the age of 8. Like many of the mothers who were interviewed, the stroller was a sore point. Alexandra's experience with the stroller was no different than the other mother's but was made all the more difficult because she had two young children in addition to the stroller. Alexandra considered the actions of some of the bus drivers to be inconsiderate. For example:

*"It just seems like when me and the kids are running for the bus, they see us, I know they see us cause they have to look in their rear view mirror when they're pulling out or whatever, and me and the kids are running and they just pull away as soon as one of my kids get to the door. That's happened a couple of times. And the 4-year old is like he just left us! Why would he do that?"*

Another example is *"one bus driver wouldn't let us on the bus cause there were too many seniors and we had a stroller, he wasn't going to ask the seniors to move back."* While this may appear inconsiderate, the bus driver's actions were reflective of the transportation authority's policy on priority seating.

Mona from Site B schedules her errands around her baby, the stroller and rush hour. Mona avoids riding the bus during rush hour with a stroller because there is a greater chance there will not be enough room to board *"It's awful because there is only one bus here and sometimes it's packed. Sometimes there are already two strollers on*

*board.” At the time of the interview, the baby had only ridden the bus 10 times and Mona was still easing her into a new experience “If she cries, I’m not so comfortable. She likes when bus is moving but she doesn’t like it when it stops...she doesn’t like the bus.”* Mona elaborated upon the difficulty of living in an area with poor bus access with a young child *“I’m in the worst position right now. My main problem is I don’t drive. I don’t know how to drive.”*

### **10.8.3. Gender**

Of the 12 interviews, 9 participants were female. The biggest concern among the female participants was safety. Given the choice between riding the bus or the SkyTrain at night, most of the female interview participants preferred to ride the bus. The presence of a driver and the driver’s access to a phone was reassuring for the females.

The conversations regarding safety when walking home at night also varied. Several participants did not feel safe in their neighbourhoods. Mona (Site B) said she did not feel safe on her walk home at night *“I do not feel safe. At winter time there are less people in the street. I don’t know why but winter time is more scary and it’s dark at 4-5 p.m. winter time is more scary. I travel less during winter time.”* Peter (Site A) also noted his concerns about safety and related it to a previous experience when he was jumped not far from his home.

*“It’s not the transit system itself. It’s the walk home is where it becomes dangerous...it would change for the kind of person you are. If you’re an attractive female you’re going to get hit on like crazy or get people you don’t want around...one of my friends, she lives in Surrey Central and her walk was literally 5 minutes from the SkyTrain she refused to do that walk.”*

Upon asking if his friend was being overprotective Peter said, *“No, she’s probably smart. You should always take precautions.”*

Other participants felt their neighbourhoods were safe. Chantel (Site C) feels safe in her neighbourhood and is supportive of her daughter walking the neighbourhood in the evenings with a friend. She has taught her daughter to read body language, to

remain on well-lit streets, how to formulate an exit strategy if she suspects something wrong and to remain aware of cars since they cannot see her at night.

A parent's experiences and perceptions about transit overlap into their children's experiences. Jane (Site A) has three teenage daughters. Her daughters are involved in numerous extracurricular activities which take place on weeknights. If Jane works a late shift the girls will take a taxi home. Jane notes that it is rare the girls will take the bus in the evenings. Jane also has her reservations about the neighbourhood (people walking around with backpacks late at night, poor police presence in the neighbourhood). Jane's does not feel her fare is representative of the transit experience "*sometimes you have to sit with someone you don't want to sit with, see something you don't want to see. You're paying for this so buy a car!*"

Of the 12 interview participants, 3 were male. The males had very different opinions regarding public transit compared to the women. All 3 men drove personal vehicles. Peter (Site C), the youngest male of the male participants (23 years old) voluntarily took public transit for economic and environmental reasons. When asked to recall their previous experiences with public transit, the older men had barely if any, previous experiences riding public transit. The older males were very critical of public transit and disliked the public transit experience mainly due to ridership (it should be noted that their observations about the public transit system were not recent and were derived from the few select experiences when did had ridden public transit). Their concerns echo an observation made by Walker (2011) "*Associating busses with failure or poverty is a common attitude in certain cities.*"

Female riders Chantel (Site C), Judy (Site C) and Christine (Site D) echoed similar comments about ridership. The female participants were most concerned about riders who were inebriated; it affected their sense of safety on public transit. The men were not concerned about personal safety but had strong opinions about the people who rode public transit. Simon (Site C) noted his observations about SkyTrain riders and bus riders "*Bus is very crowded and different people ride the bus than the SkyTrain people... You see there's a lot of difference between those people and bus people.* Edmond's (Site B) reasons for passing on the bus were more specific than Simon's "*people using*



*bad language, people shouting, people spitting inside the bus. I don't want to see it...people fighting with the bus driver."*

## **10.9. Issues Facing Housing Providers**

Interviews with social housing providers demonstrate that although public transit was a consideration prior to the construction of social housing, there were no formal policies which made public transit accessibility obligatory for a site. Stakeholders were more likely to consider public transit when constructing seniors housing but the same consideration was not applied to family housing. Housing providers cited factors such as land cost, zoning and schools as considerations which took precedence over public transit accessibility. A housing provider elaborates: *"Do we take transportation into consideration when we plan a site? While it is a consideration, it's not a high priority. We need land that is first of all zoned, serviced and free."*

Housing providers displayed a lack of awareness surrounding the transportation habits and methods of their residents. Although they had a general awareness of the transportation needs of some residents, they did not have strong knowledge of their non-work destinations and transportation habits. BC Housing is unaware if the parking they have provided in their buildings is oversupplied or undersupplied.

BC Housing is a provincial agency and reports through a Board of Commissioners. The Government's Letter of Expectations is an agreement between the Minister Responsible for Housing and the Chair of BC Housing which clarifies the roles of each party. The letter specifies that BC Housing's responsibilities are to undertake programs, implement the provincial housing strategy, administer the Homeowner Protection Act and provide construction capital management expertise (Government's Letter of Expectations, 2012). The letter makes no mention of policy or research. A stakeholder elaborates:

*"[BC Housing] don't have a policy shop per se. Any policy is done in Victoria... [BC Housing have] dovetailed their priorities into the federal priorities and they don't do a*

*call for proposals or anything. They generally have been out there building themselves and then they put out an RFP for operators.”*

Although Vancouver and Burnaby have done work related to housing policy, it is the provincial government who decides how much to fund and which housing programs to implement. The previous decade has seen a bias towards housing with supports and housing for seniors. The interview excerpt above hints at a desire for the provincial government (BC Housing) to embrace a more proactive role in housing.

## **10.10. Summary of Study Findings**

The social housing sector in Vancouver and Burnaby remains unaware and disconnected from the transportation concerns and experiences of its residents. When asked, many social housing providers had never even considered the links between housing and transit for families. The preliminary findings in this study suggest a rich source of untapped information. Information such as commute times and work locations should be collected and studied to inform future developments. The following chapter will elaborate upon how this can and should happen.

## 11. Summary and Conclusions

Based on the findings in this study, it can be concluded that social housing locations impact the use of public transit. But social housing locations are not the sole determinants of transportation mode. The decision to ride a bike or drive a car is supplemented by other factors as well.

Despite the efforts of transportation authorities and advocates who recommend the benefits of public transportation, a stigma about public transit still exists. For some, this stigma was so strong; they willingly relinquished their limited disposable income and directed it to their cars.

Or perhaps there is a lack of understanding about financial management and the total costs of maintaining a car (insurance, maintenance, and gas) and the savings which can be incurred through public transit.

Public transit maps and schedules require some literacy (the ability to read maps, understand English). New residents may feel intimidated by the information or lack the means to access this information (internet, computer, smartphone, literate in English).

Riders who displayed poor manners and/or were unaware of public transit etiquette was also another frequently cited reason that took away the enjoyment of the transit experience.

The literature review discussed the importance of linking housing, jobs and transit. Spatial mismatch was evident for all residents as most of them had weighed or continued to weigh the pros and cons of owning a car or riding public transit. This debate continued even for residents who owned a car.

Social housing providers and TransLink currently do not work directly together sufficiently. The existing interactions are limited to informal phone calls after the building has been built or they are limited to the circulation of a new development application at the municipality's discretion. Stakeholders noted that Vancouver and Burnaby are typically well-served when it came to public transit in comparison to other municipalities. Although correct, interviews with residents noted that the existing routes and services do not service their needs at the times and frequencies they would like.

This study also explored the idea that there is an element of personal choice involved when an individual considers transportation modes. Overall, residents made a choice about public transportation based six main reasons: **Individual** (personal perceptions, opinions, experiences and stigmas which influence an individual's decision to ride or pass on public transit); **Family structure** (number of children, age of children, disability are all factors which can influence the income of a household); **Work destinations**; **Non-work destinations** (regular trips which include errands, visiting friends and family, health, religion and/or spirituality); **Public transit availability** (frequency); and, **Built environment** (land use, street connectivity, topography, urban design).

Despite the unaffordability of a car, some interview participants were willing to spend beyond their affordability to drive a car. The manner and process in which families made this decision varied and although the weighing may have been different for every family, they all considered the car a worthwhile investment. Research regarding the compromises, choices and costs made by low-income families requires further investigation.

The knowledge overlapping the social housing and transportation sectors remains undeveloped. Neither the transportation nor housing sectors have contemplated this topic sincerely as evidenced by the lack of supplementary research and persuasive policies. Some of the social housing providers in this study had never even considered linking the two. They may have made the connection with seniors housing but this connection was omitted when it came to family housing. It was assumed that families were either able-bodied enough to walk to transit or it was assumed they owned a car. It

can be presumed that this assumption is hurtful and unwarranted. There was consensus among stakeholders that there is a lack of research in the relationships, causes and consequences of social housing and transportation. The existing research that has been completed has been conducted by organizations who either straddle the two sectors such as Metro Vancouver or organizations that represent a sector such as BCNPHA (BC Non-Profit Housing Association). The existing research is basic and does not provide the details necessary to initiate the necessary policies.

All stakeholders were asked to elaborate upon what they thought were the most significant issues facing low-income families in Vancouver and Burnaby. Their answers are listed below in order of popularity (most popular being the first). The answers were all very similar in the sense that they alluded to a larger political picture. The impact of neoliberal logic on affordable housing in Canada was a theme that was hinted at by various stakeholders and even pointed to specifically by one social housing provider.

**Affordability and availability of housing.** The cost of today's market housing in Vancouver is out of reach for many low-income families. The trend that has taken place in Vancouver and to some extent, Burnaby is the larger a family becomes the further out they have to travel to seek housing that suits their income. Many of the older purpose-built rental housing stock is deteriorating given their age (40-50 years old) and the new apartments do not compare to the affordability of these older structures.

**Low-Income.** Some people have low-incomes due to a host of reasons: mental health issues, physical disability, addictions, bad luck, illness, accident, divorce, business failure, immigration, fleeing an abusive relationship, etc. When probed why low-income is prevalent in Vancouver and Burnaby, one stakeholder said:

*“Everybody has networks of support in areas of relationships, finances, emotions and spirituality. Somehow when a trauma happens those networks of support get shattered. That was probably the most significant thing that happens I've seen in people in low-income situations...the common denominator is something has gone badly wrong in someone's life”*

**Poverty.** Half of Burnaby's population are immigrants (this is 5% higher than in Vancouver). For some immigrants, it takes time to establish their careers and education in a new country. The services they require may not be offered in their native language. Until they have settled, immigrants may experience poverty. Poverty also prohibits a family's ability to secure safe, affordable and adequate housing.

The existing systems and processes we have in place are not perfect. There are opportunities for further research and review. These will be elaborated upon in the next section.

### **11.1. Directions for further research**

A topic which elicited similar and consistent comments from interview participants was the lack of awareness and education around topics such as priority seating, how to accommodate a stroller and the role of hidden disabilities. It is recommended that an education campaign be introduced to educate riders about these and other related topics. The campaign could begin in elementary and secondary schools. Lessons and field trips teaching students how to ride public transportation could be incorporated into the school curriculum. The program would build confidence at an early age and would be relevant to those who live in households where public transit is not endorsed. Other possible avenues for education targeted at an adult audience could include commercial advertising.

In 2012, Metro Vancouver completed a parking study. The study examined the apartment parking supply and determined that parking demand is lower in areas near

the Frequent Transit Network; car ownership is lower among apartment renters; and, visitor parking tends to be oversupplied<sup>35</sup>. The parking data in this study parallels Metro Vancouver's findings. Although the data in this study is not conclusive, the results suggest further research is warranted. It is recommended that a parking study specific to social housing sites in Metro Vancouver be conducted by Metro Vancouver or an umbrella organization such as BCNPHA.

It is not uncommon for one sector to be disconnected from another; in this case it is the social housing and transportation sectors. Interviews with stakeholders suggest that it would be beneficial for both sectors to increase their awareness of one another. One such recommendation is combining housing and transit data on a digital map. The map would illustrate bus routes and assist housing providers in determining the transit quality of different neighbourhoods. Maps could be completed by students or interns who possess geographic information system (GIS) experience. Most of this data is already available. BC Housing's housing listings maintain a list of social housing and co-operative housing sites in the province. The addresses could be transferred to an excel spreadsheet and converted into a GIS layer. TransLink and BC Housing could share these GIS layers with each other. This map could also assist residents in choosing housing.

The current transit discount program is based on age and disability as they are made available to seniors, children, students and those with disabilities. The discount programs do not reflect the needs of all households. The question of whether this model is relevant to our present society can be questioned. It is recommended that TransLink

<sup>35</sup> Metro Vancouver. (2012).

review their discount programs and determine if their discounts are consistent with other discounts in the city. For example, rental assistance programs such as RAP and SAFER consider age in addition to other factors such as income. A financial impact report would be included in that review to determine its financial viability.



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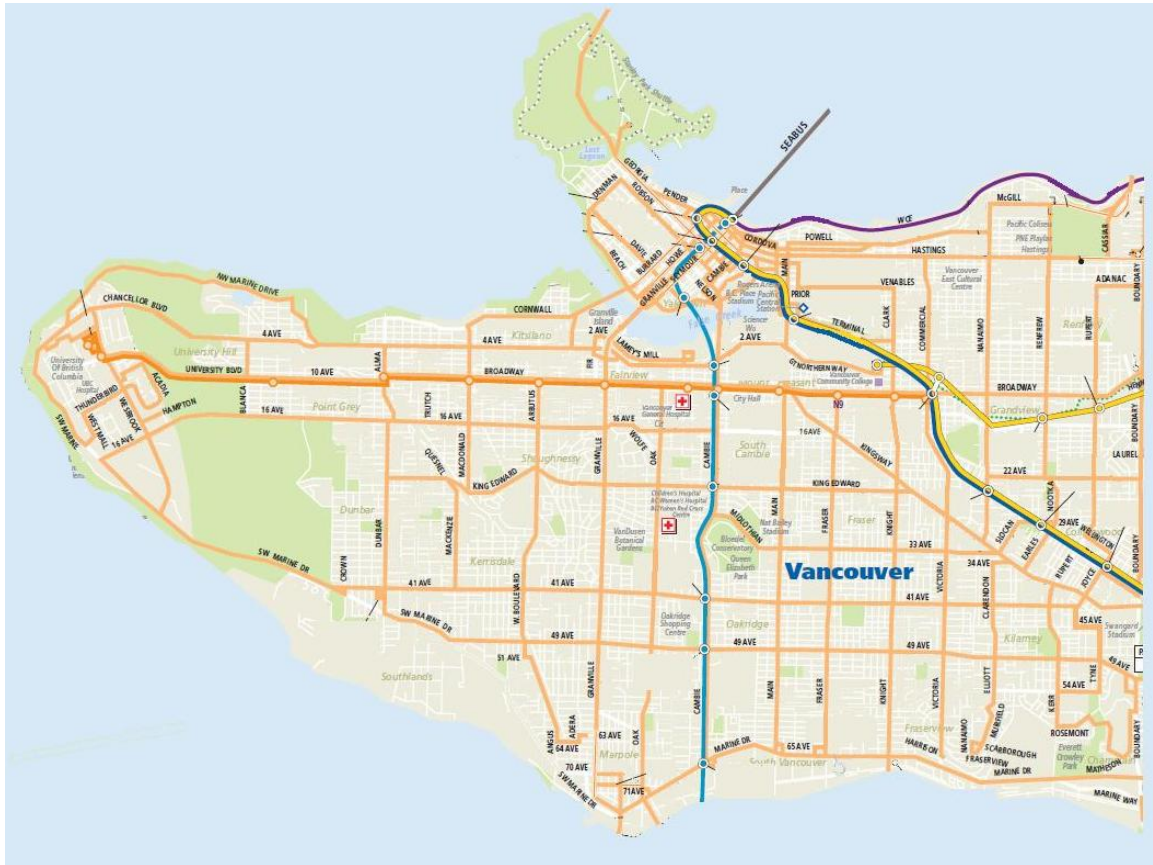
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## **Appendices**

## Appendix A.

### Vancouver Bus and SkyTrain Service Areas

There are a total of 21 SkyTrain stations and 36 bus routes in Vancouver<sup>36</sup>.



<sup>36</sup> TransLink. (2012c)

## Appendix B.

### Burnaby Bus and SkyTrain Service Areas

There are a total of 16 SkyTrain stations and 26 bus routes in Burnaby<sup>37</sup>.



<sup>37</sup> Translink. (2012).

## Appendix C.

### Social Housing Resident Interview Questions

1. Tell me a bit about yourself and your family.
2. What percentage of your income do you spend on housing per month?: \_\_\_\_\_%
3. What percentage of your income do you spend on transportation per month (includes transit pass, parking, insurance, gas for the car, car maintenance)? \_\_\_\_\_%
4. Is transit affordable for you and your family? Do you think the fares are reasonable?
5. Do you own a car?
6. What were the reasons you chose to live at (NAME OF SITE)?
7. Are you satisfied with the transit in your neighbourhood?
8. Where is your current workplace located (postal code or with aid of map)?
9. Do you feel comfortable in this neighbourhood?
10. What are your work hours like?
11. If you were to look for work, what would be your ideal area? Ideal commute time?  
Ideal commute?
12. What types of jobs do you look for?
13. Do you have an idea of where your neighbours in this complex working or where they go to work?
14. How far are you willing to live from work?
15. What do you look for when you want to move?
16. What has your experience been like taking transit?
17. Are there a lot of transit options in this area? If no, do the routes take you where you need to go? Do you transfer often? What are your thoughts about transferring?
18. Which grocery store do you shop at?

19. Can you describe the impact that transit has in your life? A way to think about this is to frame it as “if transit was not nearby...”
20. What do you look for in a job? Easy to get to?
21. Do you avoid certain bus routes or drivers? Why?
22. Do you have a preference between the SkyTrain, bus or car (scenario a: assume cost isn't a concern, scenario b: assume cost is a concern)? Which would you chose and why?
23. How far are you willing to allow your child to walk unsupervised?
24. When you moved here, how did you figure out how to get around?
25. How does transit in this area compare to other areas you have lived in the past?
26. What is your experience in taking transit with your children? Can you describe it or describe a specific situation that comes to mind.
27. Can you provide a brief description of how you and your family get around on weekdays?
28. Can you provide a brief description of how you and your family get around on weekends?
29. Is weekend transit service important for you and your family?
30. Do you feel safe taking and waiting for the bus? What about at night?
31. Why do you take transit?
32. Has transit changed your life?
33. In your opinion, can transit be improved to suit you and your household's needs?
34. Do the bus routes near your home take you where you need to go?
35. What other bus routes would you like to see this bus stop provide? Which areas would you like to see it visit?
36. Do you ride the bus differently in the summer versus the winter? In the rain versus the sun?

## **Appendix D.**

### **City of Vancouver and Burnaby Interview Questions**

1. Can you tell me about your municipality and what you do.
2. Does your municipality lease or own affordable housing sites?
3. Does your municipality have any information about how low-income families get around (walk, bike, bus, etc) and is this information available?
4. What do you think are the most significant issues facing families in your municipality?
5. Does your municipality monitor affordable housing need? Please describe.
6. Does your municipality monitor transit need? Please describe.
7. How does your municipality plan new bike routes and trails? Can you elaborate on the research you would conduct for these items?
8. Can you describe your municipality's relationship with TransLink?
  - a. Does your municipality work with TransLink when planning or improving bus routes?
9. Does your municipality offer transit assistance to low-income residents?
10. Has your municipality received complaints or comments from residents regarding transit? Can you provide some examples?
11. What characteristics influence transit demand?
12. Is transit demand being met in your municipality?
13. Is affordable housing demand being met in your municipality?
14. How do you decide which bus stops to install bus shelters and benches?
15. Does your municipality have policies which mutually benefit housing and transportation?
16. Are affordable housing and public transit linked?

17. For the City of Vancouver:

- a. At this time, over one-third of social housing in Vancouver is on City-owned land. How does the city decide which sites to lease for housing? Can you explain this process?
- b. At this time, Burnaby has an affordable housing incentive where parking requirements are reduced for all housing located in areas with good access to transit. Does Vancouver have similar policies?
- c. Does the City of Vancouver's social infrastructure department interact with the City's Transportation and Engineering Departments? And in what way?

18. For the City of Burnaby:

- a. At this time, Burnaby purchases properties close to parks and major streets in anticipation of future expansions, Some of those sites are residential and they are rented out at market rents. Would the City of Burnaby consider renting them below market rate similar to Vancouver?
- b. At this time, Burnaby has an affordable housing incentive where parking requirements are reduced for all housing located in areas with good access to transit. Has this policy been successful? Why or why not?

19. Does social exclusion exist in your municipality?

20. Do the locations of affordable housing impact jobs?

21. Does the availability of transit impact jobs?

22. Does a neighbourhood's median income affect transit and housing demand?



## **Appendix E.**

### **Social Housing Provider Questions**

1. Tell me about your organization and what you do.
2. Does your organization have any information about how low-income families commute (walk, bike, bus, etc.) and would this information be available?
3. What do you think are the most significant issues facing low-income families?
4. Does your organization monitor housing demand and how they do it?
5. Does your organization conduct research before constructing or improving buildings?
  - a. Do you consider transit locations? Do you differ between SkyTrain and busses?
6. Do low-income families use public transit? More than non low-income households?
7. Does your organization offer transit assistance programs for its residents?
8. Has your organization received requests for public transit assistance in the past?
9. Does your organization have a working relationship with TransLink? Can you describe that relationship?
10. Does your organization have records of car ownership in their complexes? Could this data be released to the researcher?
11. Are transit fares affordable for low-income families?
12. Are the transit needs of your residents the same, regardless of their location (e.g. Vancouver vs. Burnaby)?
13. Does a household's income affect transit demand?
14. Are public transit needs being met equally on your sites?
15. Do different municipalities have different affordable housing needs?
16. Do you think social exclusion exists in Vancouver and Burnaby? Please explain.

17. Do the locations of affordable housing impact jobs?
18. Does the availability of transit impact jobs?
19. Could you operate without BC Housing funding?
20. Do you think there should be a dialogue (assuming one does not exist at this time) between social housing providers such as yourself and TransLink?
21. Do you provide transit information to residents and applicants? Or is there an expectation that they figure it out on their own?
22. Do you negotiate parking spaces with the city?
23. Do you speak to TransLink prior to constructing new routes?

## Appendix F.

### Social Housing Site Public Transportation Scores

The scores indicate that almost half of Burnaby's social housing sites are not located within walking distance to a SkyTrain station. Social housing sites in Vancouver were more likely to be located within walking distance to a SkyTrain station (30% of Vancouver's sites were not located within walking distance). Social housing sites in the DTES and Strathcona had the strongest transit scores because many parts of those neighbourhoods are well-served by transit.

#### LEGEND



Site #	SkyTrain Stations (1,750m)	Bus Stops (400m)	Bus Routes (400m)	Total Score	Average Score	City - Neighbourhood
1	5	21	26	52	26.0	Vancouver - West End/Downtown
2	6	17	21	44	22.0	Vancouver - West End/Downtown
3	4	14	17	35	17.5	Vancouver - DTES/Strathcona
4	4	14	17	35	17.5	Vancouver - DTES/Strathcona
5	6	12	11	29	14.5	Vancouver - West End/Downtown
6	3	12	12	27	13.5	Vancouver - DTES/Strathcona
7	4	6	15	25	12.5	Vancouver - West End/Downtown
8	4	13	8	25	12.5	Vancouver - Mount Pleasant
9	3	11	11	25	12.5	Vancouver - DTES/Strathcona
10	4	4	17	25	12.5	Vancouver - West End/Downtown
11	5	6	13	24	12.0	Vancouver - West End/Downtown
12	3	8	13	24	12.0	Vancouver - DTES/Strathcona
13	0	13	9	22	11.0	Vancouver - Grandview
14	2	12	8	22	11.0	Vancouver - Fairview
15	3	11	8	22	11.0	Vancouver - DTES/Strathcona

16	3	11	8	22	11.0	Vancouver - DTES/Strathcona
17	0	13	7	20	10.0	Vancouver - Grandview
18	0	13	7	20	10.0	Vancouver - Grandview
19	2	11	7	20	10.0	Vancouver - Hastings/Sunrise
20	2	10	8	20	10.0	Vancouver - DTES/Strathcona
21	2	10	8	20	10.0	Vancouver - DTES/Strathcona
22	6	10	4	20	10.0	Vancouver - West End/Downtown
23	0	12	7	19	9.5	Vancouver - Grandview
24	3	10	5	18	9.0	Vancouver - Hastings/Sunrise
25	2	12	4	18	9.0	Vancouver - Renfrew/Collingwood
26	2	9	6	17	8.5	Vancouver - DTES/Strathcona
27	0	9	7	16	8.0	Burnaby North
28	0	9	7	16	8.0	Burnaby North
29	2	9	5	16	8.0	Vancouver - Grandview
30	1	11	4	16	8.0	Vancouver - Killarney
31	2	8	6	16	8.0	Vancouver - DTES/Strathcona
32	0	6	9	15	7.5	Vancouver - DTES/Strathcona
33	0	7	8	15	7.5	Vancouver - Grandview

34	3	9	3	15	7.5	Vancouver - South Cambie/Riley Park/Kensington
35	0	7	7	14	7.0	Vancouver - Grandview
36	1	7	6	14	7.0	Vancouver - Oakridge/Marpole
37	1	4	9	14	7.0	Vancouver - Fairview
38	0	10	3	13	6.5	Vancouver - Victoria/Fraserview/Sunset
39	0	9	4	13	6.5	Burnaby Southeast
40	0	6	7	13	6.5	Vancouver - Fairview
41	2	6	5	13	6.5	Vancouver - Renfrew/Collingwood
42	2	5	6	13	6.5	Vancouver - Renfrew/Collingwood
43	1	8	4	13	6.5	Burnaby Southeast
44	0	5	7	12	6.0	Burnaby North
45	0	9	3	12	6.0	Vancouver - Victoria/Fraserview/Sunset
46	2	6	3	11	5.5	Vancouver - Grandview
47	1	8	2	11	5.5	Vancouver - Killarney
48	2	7	2	11	5.5	Vancouver - West Side
49	2	7	2	11	5.5	Vancouver - Grandview
50	2	5	4	11	5.5	Vancouver - Mount Pleasant
51	2	6	3	11	5.5	Vancouver - South Cambie/Riley Park/Kensington

52	0	6	5	11	5.5	Vancouver - Kitsilano
53	0	9	1	10	5.0	Vancouver - Killarney
54	0	5	5	10	5.0	Vancouver - Grandview
55	0	7	3	10	5.0	Vancouver - Grandview
56	1	6	3	10	5.0	Burnaby Southeast
57	3	6	1	10	5.0	Vancouver - Renfrew/Collingwood
58	1	6	3	10	5.0	Vancouver - West End/Downtown
59	2	7	1	10	5.0	Vancouver - South Cambie/Riley Park/Kensington
60	2	6	2	10	5.0	Vancouver - Fairview
61	0	6	3	9	4.5	Vancouver - Victoria/Fraserview/Sunset
62	0	6	3	9	4.5	Vancouver - Victoria/Fraserview/Sunset
63	0	4	5	9	4.5	Vancouver - West Side
64	0	7	2	9	4.5	Vancouver - Killarney
65	0	4	5	9	4.5	Vancouver - Grandview
66	2	4	3	9	4.5	Vancouver - Grandview
67	2	4	3	9	4.5	Vancouver - Fairview
68	1	6	2	9	4.5	Burnaby Southwest
69	1	7	1	9	4.5	Burnaby Southeast

70	2	4	2	8	4.0	Vancouver - South Cambie/Riley Park/Kensington
71	2	3	3	8	4.0	Vancouver - Mount Pleasant
72	2	5	1	8	4.0	Vancouver - Grandview
73	2	3	3	8	4.0	Vancouver - Renfrew/Collingwood
74	1	6	1	8	4.0	Burnaby Southeast
75	2	2	4	8	4.0	Vancouver - Renfrew/Collingwood
76	3	2	3	8	4.0	Vancouver - Fairview
77	0	6	2	8	4.0	Vancouver - South Cambie/Riley Park/Kensington
78	0	4	4	8	4.0	Burnaby North
79	2	2	3	7	3.5	Burnaby North
80	3	3	1	7	3.5	Vancouver - Renfrew/Collingwood
81	3	3	1	7	3.5	Vancouver - Fairview
82	2	4	1	7	3.5	Vancouver - Renfrew/Collingwood
83	3	3	1	7	3.5	Vancouver - Hastings/Sunrise
84	2	4	1	7	3.5	Vancouver - Fairview
85	2	2	2	6	3.0	Vancouver - South Cambie/Riley Park/Kensington
86	2	2	2	6	3.0	Vancouver - South Cambie/Riley Park/Kensington
87	3	2	1	6	3.0	Vancouver - Fairview



88	3	2	1	6	3.0	Vancouver - Fairview
89	1	1	4	6	3.0	Vancouver - Renfrew/Collingwood
90	0	5	1	6	3.0	Burnaby North
91	0	2	4	6	3.0	Vancouver - Grandview
92	1	3	1	5	2.5	Burnaby Southeast
93	1	3	1	5	2.5	Burnaby Southwest
94	2	2	1	5	2.5	Burnaby Southwest
95	0	4	1	5	2.5	Burnaby Southeast
96	0	4	1	5	2.5	Vancouver - Killarney
97	0	4	1	5	2.5	Vancouver - Killarney
98	0	4	1	5	2.5	Vancouver - Killarney
99	0	2	1	3	1.5	Burnaby Southeast
100	0	2	1	3	1.5	Burnaby Southwest
101	0	2	1	3	1.5	Burnaby North
102	3	0	0	3	1.5	Vancouver - Mount Pleasant
103	1	1	1	3	1.5	Burnaby Southeast
104	2	0	0	2	1.0	Burnaby Southeast
105	2	0	0	2	1.0	Burnaby North

106	0	1	1	2	1.0	Burnaby Southeast
107	0	1	1	2	1.0	Vancouver - Victoria/Fraserview/Sunset
108	0	0	0	0	0.0	Vancouver - Killarney

## Appendix G. Bus Frequency

No bus service

### Site A - Bus Frequency (Weekday)

<b>SITE A WEEKDAY</b>	A.M.								P.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	1	3	3	3	2	2	2	2	2	2	4	2
<b>SITE A WEEKDAY</b>	P.M.								A.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	4	3	2	2	1	1	1	1				

### Site A - Bus Frequency (Weekend)

<b>SITE A WEEKEND</b>	A.M.								P.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1		2	2	2	2	2	2	2	2	2	1	2
<b>SITE A WEEKEND</b>	P.M.								A.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	2	2	2	2	1	1	1	1				

Source: TransLink. (2012c)

### Site B - Bus Frequency (Weekday)

<b>SITE B WEEKDAY</b>	A.M.								P.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	5	6	5	6	5	5	5	5	5	5	5	6
<b>SITE B WEEKDAY</b>	P.M.								A.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	6	6	4	4	3	3	3	2				

### Site B - Bus Frequency (Weekend)

<b>SITE B WEEKEND</b>	A.M.								P.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	3	3	4	4	4	3	4	4	4	4	4	4
<b>SITE B WEEKEND</b>	P.M.								A.M.				
	<b>Bus</b>	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
	Bus #1	4	4	5	4	2	2	2	2				

Source: TransLink. (2012c)

### Site C – Bus Frequency (Weekday)

SITE C WEEKDAY	A.M.							P.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1		3	4	4	4	4	4	4	4	4	4	4	4
Bus #2	1	7	11	12	12	8	8	7	8	8	9	8	
Bus #3													
Bus #4	1	2	2	2	2	2	2	2	2	2	2	2	2
Bus #5	1	8	7	4	4	4	4	4	4	4	4	4	4
Bus #6		2	2	2	2	2	2	2	2	2	2	2	3
Bus #7											2	2	

SITE C WEEKDAY	P.M.							A.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1	4	4	4	4	3	2	2	2	2	1			
Bus #2	8	6	5	8	4	4	4	3	2	1	2		
Bus #3													
Bus #4	2	2	2	2	2								
Bus #5	4	4	4	2	2	2	2	2	1				
Bus #6	2	3	2	2	2	2	3	1					
Bus #7	1	1											

Source: TransLink. (2012c)

### Site C - Bus Frequency (Weekend)

SITE C WEEKEND	A.M.							P.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1		3	3	4	4	4	4	4	4	4	4	4	4
Bus #2		2	4	4	5	5	4	5	5	5	5	5	5
Bus #3													
Bus #4			2	2	2	2	2	2	2	2	2	2	2
Bus #5		2	2	2	4	4	4	4	4	4	4	4	4
Bus #6			1	2	2	2	2	2	2	2	2	2	2
Bus #7													

SITE C WEEKEND	P.M.							A.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1	4	4	4	4	3	2	2	2	2	1			
Bus #2	5	5	5	4	3	3	3	3	3				
Bus #3										1	2		
Bus #4	2	2	2	2	2								
Bus #5	4	4	3	2	2	2	2	2	1				
Bus #6	2	2	2	2	1	2	2	2					
Bus #7													

Source: TransLink. (2012c)

### Site D – Bus Frequency (Weekday)

SITE D WEEKDAY	A.M.							P.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1		3	4	5	4	4	4	4	4	4	4	5	
Bus #2													
Bus #3	1	4	4	4	4	4	4	4	5	3	6	5	
Bus #4													
Bus #5		3	5	4	2	2	2	2	2	2	4	4	
Bus #6						2	2	2	2	2	3	4	
Bus #7												2	

SITE D WEEKDAY	P.M..							A.M.					
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4	4:01-5
Bus #1	5	3	3	3	3	3	3	3	1				
Bus #2									1	2	1		
Bus #3	5	4	3	1									
Bus #4				1	2	2	2	2	1				
Bus #5	4	4	3	1									
Bus #6	4	2											
Bus #7	1												

Source: TransLink. (2012c)

### Site D – Bus Frequency (Weekend)

SITE D WEEKEND	A.M.							P.M.				
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4
Bus #1		3	3	3	4	4	4	4	4	4	4	4
Bus #2												
Bus #3	1	2	3	5	5	4	3	5	3	4	4	4
Bus #4												
Bus #5			2	2	2	2	2	2	3	3	3	3
Bus #6						2	2	2	2	2	2	2
Bus #7												

SITE D WEEKEND	P.M.							A.M.				
	Bus	5:01-6	6:01-7	7:01-8	8:01-9	9:01-10	10:01-11	11:01-12	12:01-1	1:01-2	2:01-3	3:01-4
Bus #1	4	3	3	3	3	3	3	3	1			
Bus #2									1	2	1	
Bus #3	4	4	3	1								
Bus #4				1	2	2	2	2	1			
Bus #5	3	3	3	2								
Bus #6	2											
Bus #7												

Source: TransLink. (2012c)



**Appendix H.**

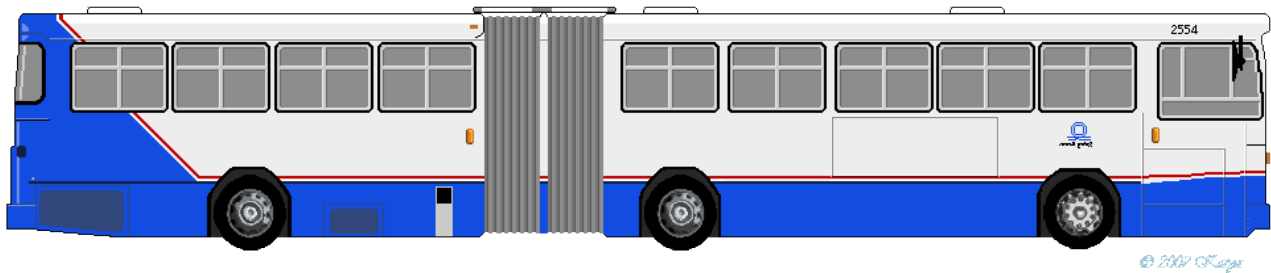
**Social Housing Resident Recruitment Flyer**

# Department of Urban Studies Simon Fraser University

## PARTICIPANTS NEEDED

To take part in a study that researches how families living in affordable housing ride transit.

As a participant in the study, you will be interviewed by the researcher. Each interview will last approximately 1-2 hours. In appreciation of your time, you will receive a gift voucher.



## Contact

FOR MORE INFORMATION ABOUT THIS  
STUDY OR TO VOLUNTEER FOR THIS STUDY,  
PLEASE CONTACT **VANESSA WONG**

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