



**Technical
Memorandum No. 1:
Investment in Rapid Transit
on Urban Land**

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Introduction

Since the mid 1970s, more than \$2 billion has been spent in Greater Vancouver on major public transit infrastructure projects of different scales, ranging from the development of a SeaBus ferry in the late 1970s, two Skytrain urban rail lines between the 1980s and the early 2000s, and three B-Line rapid bus routes in the 1990s and 2000s.

Accompanying transportation investment in Greater Vancouver has been the implementation of a wider policy to link high quality public transit infrastructure with compact, mixed land use development that would bring a range of employment and services closer to where people live. The strategic direction of developing ‘complete communities’ surrounding transit infrastructure was first laid out in the Greater Vancouver Regional District’s 1975 *Livable Region Plan*, and unanimously re-approved by all member municipalities when the *Plan* was updated in 1996.

Extensive study in other regions has explored the diverse impacts of major urban transit infrastructure projects on issues such as land use development, property prices, demographic changes in communities surrounding new transit facilities and ridership.

Some 30 years after the *Livable Region Plan* was first approved and large scale transit projects began to be developed in Greater Vancouver, this report explores the local land use, development, demographic shifts and ridership impacts that have been associated with different types of major transit investments. Due to the duration of time since the projects have been in use, the paper will focus most extensively on the Skytrain Expo Line, the SeaBus, and the 98 and 99 B-Lines. Since the Millennium Skytrain line opened in late 2001, a sufficient period of time has not yet passed to conclusively examine the impact of this investment on land use or demographic change, a challenge that is compounded by the fact that the last Canadian census of population for which data is available is 2001. Through this review, specific emphasis will be placed on highlighting the impacts of commuter ferry services, automated rail technology and rapid bus, three options that have been proposed for future transit investment in the Greater Vancouver region.

SeaBus

The SeaBus passenger ferry began providing service between Lonsdale Quay in North Vancouver and Waterfront station in Downtown Vancouver in 1977, restarting a ferry route that had not been provided for over 15 years. The SeaBus has a capacity of 400 passengers, and service is operated approximately every 30 minutes. Operations are timed to integrate with other transit services that depart from each terminal.

Since inauguration nearly 30 years ago, the areas surrounding both transit hubs have undergone significant transformations. On the City of Vancouver side, the most notable change is the area directly to the west of Waterfront station, Coal Harbour, which is in the final stages of undergoing a complete redevelopment from an old rail and industrial site to a district of high rise luxury residential towers. The SeaBus, and the transit access that it provides to the North Shore, was likely only one very small motivation among many for developing Coal Harbour, which included: an increased desirability of living in central Vancouver, rapidly rising property prices in the urban core, and the proximity to nearby amenities such as Stanley Park, the Central Business District, Denman Street restaurants and shopping, and the Gastown heritage area.

In North Vancouver the reintroduction of the SeaBus, which is connected to a local bus terminal that acts as a hub for transit service on the North Shore, has had a more direct impact in catalyzing land use transformation and change in the adjacent Lower Lonsdale area, which had previously been dominated by large shipyard facilities. However, this process has not been immediate, but instead continues to stretch over the subsequent decades, and coincided with a series of external changes in the surrounding area.

Nine years after the SeaBus ferry service was restarted, in 1986, the award winning upscale Lonsdale Quay Public Market and adjacent public pier were inaugurated next to the ferry terminal. Together these serve as popular destinations for local residents, commuters to downtown, and tourists that take the scenic SeaBus route across the Burrard Inlet, and have been anchors in the ongoing conversion process of the surrounding area. The impetus for transformation was further spurred in 1992 when after 86 years in business, the surrounding shipyards closed, making sites available for new uses. In 1997, City Council approved a development plan for a portion of Lower Lonsdale that addressed issues such as site assembly, building heights, site planning, open spaces, pedestrian linkages, traffic and amenities, as well as enhanced streetscapes, view corridors, and attractive skylines. Still, according to the City of North Vancouver, it took nearly five more years until 2001, before development opportunities were seized and a new neighbourhood began to emerge at Lower Lonsdale, a process that is still ongoing.

The City of North Vancouver has thus taken an active role in shaping and promoting Lower Lonsdale into a vision of a complete community that combines high-density residential development, with commercial, cultural and recreational opportunities. To raise interest in Lower Lonsdale from developers, residential buyers and commercial tenants, the municipality has used a range of promotional techniques such as media kits, websites, direct mailers and magazines. As such in North Vancouver, while the introduction of the SeaBus served as a spark to catalyze future development, proactive land use planning and favourable market forces have been equally central components of the revitalization of Lower Lonsdale, a process that has stretched over a 30-year period.

Since much of the development in Lower Lonsdale is fairly recent and ongoing, it is difficult to provide a detailed current profile of the type of community that is in the process of being created. However, census data for Lower Lonsdale provides the snapshot of an area that has undergone the steadiest transformation in the City of North Vancouver between 1986 and 2001, the most recent year that census data is available.

For instance, Lower Lonsdale is the most populace area in the municipality and has experienced the fastest rate of population growth, as well as the largest increase in the number of occupied dwellings, a trend that expanded most rapidly after 1991. Between 1996 and 2001, 67% of the population of Lower Lonsdale had moved residences at least once, the highest rate of any neighbourhood in the City of North Vancouver, and a figure that the municipality attributes to the neighbourhood having the highest concentration of rental housing. In 2001, only 14% of the Lower Lonsdale population was under 19 years of age, the lowest proportion of any Neighbourhood in North Vancouver, while the neighbourhood had among the highest proportion of residents over 55 years of age. More than half of all dwellings in Lower Lonsdale were located in buildings over 5 stories, compared to nearly all other areas which were predominantly covered with single family homes. Finally, despite experiencing the fastest rate of growth between 1986 and 2001, residents of Lower Lonsdale had the lowest average household income

of any neighbourhood in the City of North Vancouver at \$59,036, some \$34,000 lower than the average income in the most affluent area of Tempe.¹

This statistical overview of the neighbourhood adjacent to the SeaBus terminal provides the impression of an emerging high density, compact community, within close proximity to quality public transit facilities. In a municipality where nearly a quarter of the labour force worked in the City of Vancouver in 2001 according to the census, the SeaBus provides a particularly viable transportation alternative for those residing near the terminal. While few inferences can be drawn from the census commuting pattern data due to a stoppage of transit service that coincided with the data collection date, in 2005 the SeaBus carried over 16,000 passengers trips on a typical work day, many of whom continue their trip on another mode of transit.² This reflects a 1.6% decline in ridership on the SeaBus from the previous year, which has been attributed to the fare increase enacted in 2005.

Skytrain

Planning for the development of rail rapid transit in Greater Vancouver began in the early 1970's. After nearly a decade of intergovernmental wrangling and on again/off again decisions, the Province announced in 1980 that the first line of a regional system would be built using an innovative advanced light rail transit technology that was driverless. Known as Skytrain, it would operate underground from Waterfront Station through the city centre and on an elevated guideway as it traveled east through Vancouver and then followed an old interurban rail corridor in Burnaby and New Westminster. Plans were in place for an eventual crossing of the Fraser River and expansion into central Surrey. The development of Skytrain was planned to coincide with Vancouver's hosting of Expo 86, and construction began in February of 1982. In 1986, the first portion of the Skytrain system, called the Expo Line, opened for operation, on time and at a completed cost including interest payments of \$1.016 billion. In 1994, the extension to Surrey was completed at a total cost of \$282 million.³

Early Impact on Property Prices

An early statistical analysis of single family home prices in one east Vancouver neighbourhood between Clarke Drive and Boundary Road found a considerable lag between the time that planning for rapid transit was started, the date that the project was announced, the period when construction began, and the impact on property prices.⁴ Only in 1983, some ten years after project planning began, two years after the project was announced and one year after construction began was a rise in prices observed for properties within 600 meters from a future station. Properties further away from the stations experienced diminishing value growth. At the same time, a property's distance to the line itself, which was elevated in many locations, did not have an impact on value.

¹ For complete details on the 2001 Census data for the City of North Vancouver, please see the community profile at <http://www.cnv.org/c//DATA/1/249/COMMUNITY%20PROFILE%202004.PDF>

² See data provided in the Vancouver/UBC Area Transit Plan

³ Sproule, D. (2003). *On Track: The Skytrain Story*. Burnaby British Columbia: B.C. Rapid Transit Company Ltd.

⁴ Ferguson, B.G., Goldberg, M.A. and Mark, J. (1988). The Pre-Service Impacts of the Vancouver Advanced Light Rail Transit System on Single-Family Property Values. Pp. 78- 107. In *Real Estate Market Analysis* (Eds) Clapp, J. and Messner, S.D. New York: Praeger.

The study's authors suggest that the statistical findings reflect the market taking three years to react to the development of the Skytrain line, which was likely due to indecision surrounding the project approval during the planning phase and uncertainty surrounding the visual intrusion, noise and performance of a new technology. As construction began in 1982 making the line tangible, and BC Transit held publicity displays to promote the virtues of the new system, there was less perception of risk associated with investing in property adjacent to the new rapid transit line. With diminished risk, the market began to add value to properties near to stations some three years before the system was scheduled to be completed.

It is important to point out that in addition to transportation factors that can be used to explain the timing of changes in property prices following the announcement to develop the Skytrain, the authors highlight a series of other factors with directing change. These include high and fluctuating interest rates, regional property values in Vancouver that were rising rapidly in 1980 and 1981 and then decreased rapidly in 1982, and the nearing of Expo 86 that raised interest in redevelopment in Vancouver. Additionally, city land use plans and zoning surrounding stations (which can often include considerably increased density allowances) has an impact on the property market reaction to new rapid transit facilities.

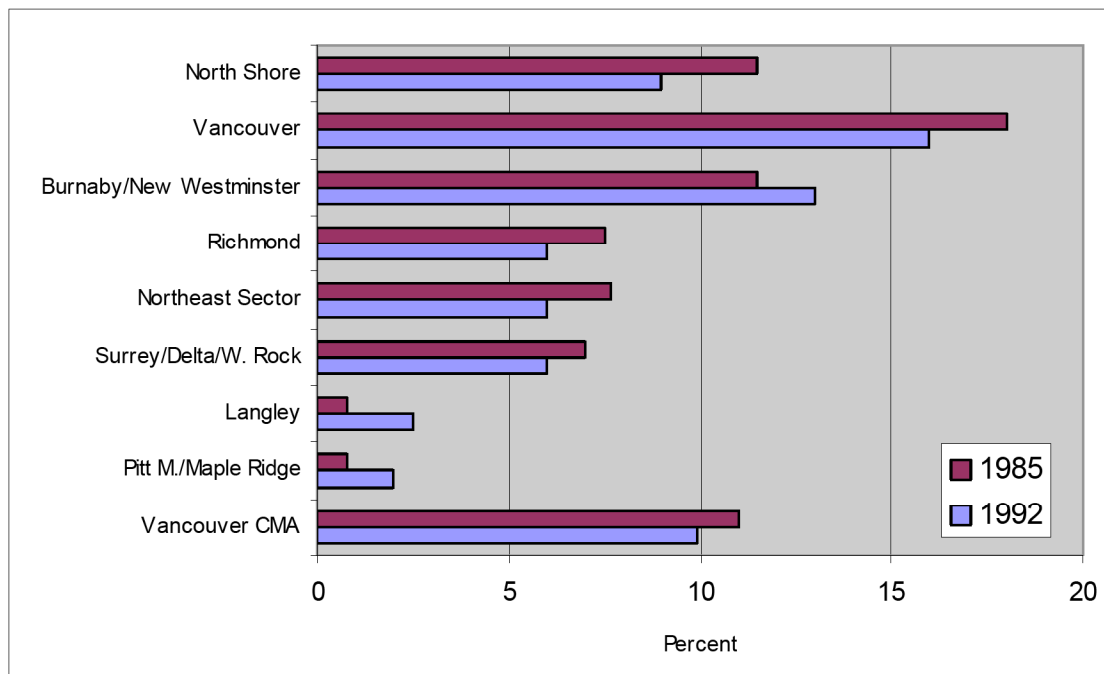
Early Impact of Skytrain on Transit Ridership

In its first year of operation in 1986, the Skytrain system carried 32.7 million people, which declined to 21.3 million boardings in 1987 and 23.2 million boardings in 1988. However, across Greater Vancouver, despite the large investment in the Expo rapid transit line, overall transit ridership was in decline. Between 1985 and 1992, while the municipalities of Burnaby and New Westminster experienced an increase in the share of personal trips made by transit, the share of all trips made in the region by transit declined by 1.3% to around 10%, while the share of trips made by automobile increased by 2.4%. The share of ridership also declined in the City of Vancouver, a municipality through which the Skytrain also passed (Figure 1).

While it could be argued that the opening of Skytrain contributed to considerably mitigating a deeper decline in transit ridership during the mid to late 1980's, a study conducted in 1987 by Peterson and Glover found that when comparing annual regional transit ridership estimates for a system with Skytrain versus one in which Skytrain had not been built, there was only about a 10% difference in expected ridership, and the rate of growth would be almost the same. The study did not provide estimates of the impact on ridership that would have occurred if funds spent on the Skytrain had been allocated to other priorities, such as expanding the region's bus network.⁵

⁵ Peterson, D. and Glover, R. (1987). *ALRT impact assessment: baseline travel survey*. Montreal: Transportation Development Centre.

Figure 1: Transit Trip Origin Mode Shares by Sub Region, 1985-1992



(Source: 1992 Greater Vancouver Travel Survey: Report Number 6)

Skytrain as a Catalyst of Land Use Change

Despite initially having only a minimal impact on system wide transit ridership in Greater Vancouver, the Skytrain Line had a considerable impact on land use in surrounding areas. A BC Transit study published in 1989 found that more than \$5 billion worth of investment had been planned or already started within a 5-10 minute walk from a Skytrain station, with an expected economic benefit in the community of \$15 billion. Much of this development was very high-density residential towers along with some office and commercial development, centrally focused in Central Vancouver, at Burnaby Metrotown and surrounding stations, and Joyce-Collingwood in the City of Vancouver. The report was clear to point out that Skytrain may not have been the main cause for all developments. In addition to the Skytrain, many of the municipalities along the route enacted special zoning to encourage transit-oriented development in some locations, and invested further in local facilities such as parks, bicycle connections and walkways near the transit line to make adjacent locations more attractive to developers.⁶ More recently, new commercial towers were developed adjacent to two Skytrain stations in Surrey to take advantage of greater accessibility provided by the rapid transit line.

A statistical analysis of census data conducted by Kristin Olson as part of her Master's dissertation in geography at the University of British Columbia confirms the relative strength of the Skytrain in catalyzing high-density residential development. As shown in Figure 2, between 1991 and 2001, the proportion of residential dwellings in buildings five stories or greater rose more than twice as fast in census tracts adjacent to the Expo Skytrain line in Vancouver,

⁶ BC Transit. (1989). Skytrain, A Catalyst for Development. Retrieved September 26, 2005, from <http://www.rapidtransit.bc.ca/media/pdf/catalyst-apr-00.pdf>

Burnaby and Surrey, when compared with the rate of increase in all other census tracts in Greater Vancouver.⁷

Figure 2: Proportion of Dwellings in Building Over Five Stories

	1991	2001	% Change
Downtown Vancouver	73	83	14
Vancouver-Burnaby Skytrain CTs	15	21	40
Surrey SkyTrain CTs	11	16	45
All other CTs	8	9	17

(Source: Statistics Canada, 1991, 2001)

While many of the developments along the Skytrain line were high density and motivated by the objectives of the *Liveable Region Plan* to link high quality transit with compact communities, many of the largest land developments remained at least to some degree oriented towards the automobile. One feature of many of the early residential and commercial developments within close proximity of the Skytrain line was the continued provision of ample parking for automobiles (Figure 3). At the Concord Pacific site adjacent to Stadium station on the Expo lands, for example, plans were in place to provide two parking spots for every one residential unit. In Burnaby around the Metrotown Skytrain station where a major new regional shopping mall, twin office towers and multiple residential towers were built, the local arterial road was widened to handle the increased car traffic volumes at an adjoining 2,900 spot parking lot. While the mix of residential and commercial land uses in single facilities means that not all parking is necessarily allocated to residential units, the continued effort to accommodate cars as part of some developments along the Skytrain route had the potential to contradict the explicit goal of using public transit investment to reduce automobile dependence.⁸

Figure 3: Selected Developments Near Skytrain Stations and Parking Allowances as Proposed in 1989

Development	Developer	Value (\$)	Station Location	Residential Units	Commercial Space (Sq. Feet)	Office Space (Sq. Feet)	Enclosed Parking Spaces
Pacific Place	Concord Pacific	2 Billion	Stadium	10,000	240,000	0	20,000
Coal Harbour (Phase 1)	Marathon Realty	1 Billion	Waterfront	1,400	60,000	0	N/A
Office Tower, 27 stories	Adams Properties Group	+100 Million	Granville/Burrard	0	269,537	336,252	492
Mixed Use Complex	Perkins and Cheung	200 Million	Main	400	64,765	77,420	850

⁷ New Westminster was excluded from the analysis due to problems with the base census data.

⁸ BC Transit. (1989). Skytrain, A Catalyst for Development. Retrieved September 26, 2005, from <http://www.rapidtransit.bc.ca/media/pdf/catalyst-apr-00.pdf>

Development	Developer	Value (\$)	Station Location	Residential Units	Commercial Space (Sq. Feet)	Office Space (Sq. Feet)	Enclosed Parking Spaces
Mixed Use Building	William Rhone	N/A	Joyce	60	N/A	0	88
Metrotown	Numerous	500 Million	Metrotown	+500	+1.5 Million	+500,000	2,900

(Source: BC Transit, 1989)

Some ten years after the Skytrain opened, a 1996 study by Bunt and Joyce of new developments near rapid transit stations found that the rate of car ownership per dwelling unit was 9% lower for those living within a short walk to a Skytrain station (300 meters) as opposed to those in more remote locations (more than 1000 meters away), suggesting that future developments along the transit corridor could be built with lower parking requirements. However, the study concluded that regardless of proximity to a Skytrain station, household income had the strongest impact on car ownership, as those earning more than \$70,000 had a 78% higher rate of car ownership per household than those earning less than \$30,000.⁹

A final point to highlight with respect to rapid transit investment as a catalyst for land use development is the variable impact that Skytrain has had on different locations along the line. While the construction of Skytrain stations catalyzed development at certain key nodes along the route, other areas have experience little new development to date. In some parts of East Vancouver, for instance, established communities comprised predominantly of single-family dwellings have been largely unchanged, with only some new low and medium density infill development. Around some station areas in the eastern part of Burnaby and the western part of New Westminster, there is little sign of redevelopment in areas that are fairly run down or comprised of industrial land uses. And in Surrey, more than 10 years after the Skytrain was extended over the Fraser River and into the regional town centre, master planning is still underway to create a transit oriented community in Central Surrey, which today is occupied predominantly by large format retail stores and parking lots (Figure 4).

This pattern where some station locations have achieved extensive new development while others have gone largely untouched suggests a need to see increased accessibility from major public transit investment as only one (albeit critical) factor in determining where new developments will occur. Issues such as the strength of the property market and the wider economy, interest rates, supply of available land, zoning stipulations, and proximity to other amenities, are features that together are equally important in determining where new development will occur.

⁹ Bunt, P. and Joyce, P. (1996). *Car Ownership Patterns Near Rapid Transit Stations*. Retrieved September 27, 2005, from http://www.citebc.ca/Feb98_Ownership.html

Figure 4: Development Surrounding Skytrain Stations



Shifting Community Demographics Surrounding Skytrain Stations

Accompanying land use change along the Expo Skytrain line, the composition of the communities adjacent to the Skytrain have undergone considerable transformations in the 20 years since the system was first inaugurated. These can be observed in a series of maps and figures based on census data that chart shifting demographic patterns in tracts surrounding the Skytrain line.¹⁰ Many of the census tracts upon which this analysis is based are larger than 500 meters, the area within which new property development is typically catalyzed by rapid transit projects. As such this analysis can be seen to be more widely examining complete neighbourhood transition as impacted by transit investment, rather than a more narrow study of the impacts of transit oriented developments.

At the outset of this analysis, it bears repeating that while the most recent census data is for 2001, many areas along the Skytrain line have continued to experience further development and transformation subsequently, and the composition of some communities today may be considerably different from five years ago. Despite the lag in updated data, this analysis does

¹⁰ The data analysis and maps were produced by Kristin Olson as part of her Master's thesis in Geography at the University of British Columbia

provide a time series image of some community transitions that occurred as neighbourhoods evolve following the development of new rapid transit infrastructure, a picture that can be updated when the 2006 census data is released.

As Figure 5 shows, between 1991 and 2001, the number of occupied dwellings along the Skytrain line increased by 44%, with the largest absolute increase in units occurring in Vancouver and Burnaby. When downtown Vancouver is excluded from the calculation, the rate of development of new residential units along the Skytrain line was around the same as in other areas not adjacent to the Skytrain line. Despite the growth in new developments, increases in the income levels of residents living along the Skytrain line have not kept pace with income levels for residents of other parts of the region. With the exception of locations in downtown Vancouver, the median family income for residents living in census tracts along the Skytrain line is below the regional median, and has increased at a slower rate between 1991 and 2001 than areas not adjacent to the Expo Skytrain line.

During the same 1991 to 2001 period, there has been a noticeable increase in the proportion of the population along the Expo Skytrain line that are considered low income, based on the Statistics Canada definition of families or unattached individuals spending 20% more than average on food, shelter and clothing. As figure 6 shows, this new clustering of low-income residents has been dramatically observed along the Skytrain line in the suburban municipality of Burnaby, with existing concentrations growing in Vancouver and Surrey central. However, other areas such as Marpole in South Vancouver and Richmond centre have also had considerable increases in the concentration of low-income residents between 1991 and 2001 despite not having any investment in rapid transit during the period. This suggests that rapid transit can be seen as only one among a wide variety of factors that attract new concentrations of low-income residents to an area.

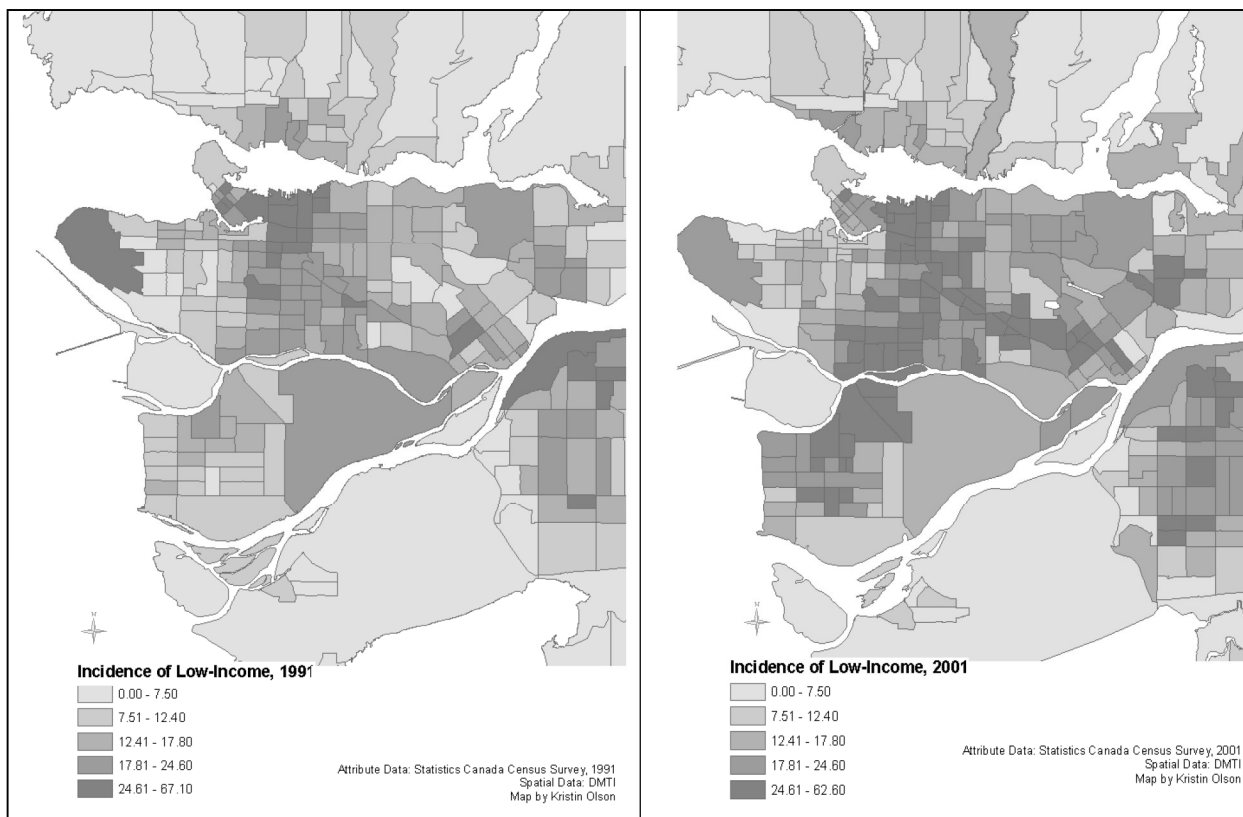
Figure 5: Statistical Profile of Communities Surrounding Expo Skytrain Line

	Number Occupied Private Dwellings	Number Occupied Private Dwellings	Rate of Change 1991 - 2001	Incidence of Low-Income 1991	Incidence of Low-Income 2001	Rate of Change 1991 - 2001	Median Family Income 1991	Median Family Income 2001	Rate of Change 1991 - 2001
GVRD - all CTs	609,220	758,690	25	14	20	41	50,266	71,706	43
Downtown Skytrain	9,670	22,345	131	27	37	36	34,779	72,546	109
Vancouver Skytrain	20,145	25,625	27	29	34	18	34,183	39,228	15
Burnaby Skytrain	19,630	25,280	29	16	34	112	45,286	43,071	-5
New West - Skytrain	4,345	6,140	41	18	21	13	41,803	54,439	30
Surrey Skytrain	6,990	7,990	14	24	29	20	39,120	44,244	13
SkyTrain - all CTs	60,780	87,380	44	23	32	40	39,058	45,729	17
SkyTrain (minus Downtown)	51,110	65,035	27	22	27	21	39,771	43,556	10

Whether the clustering of low-income residents along the Expo Skytrain line is a positive or negative community transformation is an open question. On the one hand, the clustering of low income residents in areas close to high quality public transit facilities is positive, as it provides individuals with convenient access to employment, shopping and recreational facilities along the line without having to take on the expense of owning and operating a car.

On the other hand, in the past two decades, a dispersion of employment locations away from the urban core of Vancouver and into more distant office and industrial parks has been accompanied by shifting regional travel patterns. The BC Ministry of Transportation reports that while the typical regional commuting pattern was once from the suburbs to central Vancouver, today a more complex pattern has emerged where commuters readily travel both into and out of the urban core and around the suburbs on the periphery of Vancouver to reach their place of employment.¹¹ The Expo Skytrain line, with its suburbs to city centre alignment, is not particularly well suited to provide access to the increasingly dispersed employment locations and accompanying inter-suburban travel patterns. Moreover, bus service in these suburban regions is less frequent than in the urban core of Vancouver, where larger proportions of low-income residents previously resided. There may also be fewer amenities such as medical clinics, schools and daycares within walking distance of transit in suburban locations.

Figure 6: Incidence of Low Income in Greater Vancouver, 1991 - 2001



As such, the transitions that have occurred in the communities surrounding Skytrain stations on the Expo line have had mixed implications on mobility, accessibility and livability. Beyond the brief statistical snapshot and discussion presented above, it is necessary to use a range of other indicators to gauge the positive or negative impacts of the Skytrain line. As highlighted in

¹¹ See the Ministry of Transportation Gateway Program website: <http://www.gatewayprogram.bc.ca/>

research by Leonie Sandercock at UBC's School of Community and Regional Planning, proactive planning and ongoing citizen engagement in the Joyce-Collingwood neighbourhood in East Vancouver has led to the cultivation of a vibrant, mixed income, multi-ethnic community that saw rapid redevelopment catalyzed by the Skytrain line. Other research by Jennifer Buckley as part of her 1996 Master's thesis in Criminology at Simon Fraser University identified locations adjacent to Skytrain stations as being the sites of elevated incidence of criminal activity. Further research is necessary to better understand how successful communities along the Skytrain line have developed, and what lessons can be learned so that future transit oriented communities are positive places to live and work.

Longer Term Impact on Property Values

There have been many studies that have examined the long-term impacts of investment in large-scale urban rail projects on property values. Summarizing the peer reviewed literature on projects in North America and Europe, a 2006 report published by the Real Estate Investment Network concluded that properties within close proximity (500 meters) to a rail rapid transit station had values that were between 10% and 20% higher than properties located further away from transit. Moreover, they found that properties close to transit stations would outperform properties in locations where transit was not developed. If market prices rose, locations close to transit stations would see values rise by between 10% and 20% greater than the rest of the region; if the market declined, prices would decline by between 10% and 20% less than the rest of the region.¹²

An analysis of property values surrounding the Skytrain in Greater Vancouver since 1981 reveals a pattern that is somewhat different from the international experience as highlighted in the Real Estate Investment Network study. Calculations by Kristin Olson based on census data show that between 1981 when the finalized Skytrain proposal was first announced and 1991, five years after the line was completed, property values in census tracts along the Skytrain line in the City of Vancouver, Burnaby and Surrey rose by 63%, a 12% faster rate of growth than census tracts not located adjacent to the Skytrain line or the proposed extension site. However, between 1991 and 2001, with the Expo Skytrain line now extended on to central Surrey, property values in census tracts along the line increased by 10%, a 13% slower rate of growth than in census tracts not located adjacent to the Skytrain line. And over the 20 year period between 1981 and 2001 as a whole, property values in census tracts along the Skytrain line grew by 80%, 6% less than values in census tracts not adjacent to the Skytrain line (Figure 7).

Figure 7: Property Price Changes In Greater Vancouver, 1981 - 2001

	2001	1991	1981	% change 81-01	%change 81-91	%change 91-2001
SkyTrain CTs	\$228,891	\$207,184	\$126,930	80	63	10
Non-Skytrain CTs	\$322,060	\$262,027	\$173,001	86	51	23
GVRD	\$311,071	\$255,558	\$167,575	86	53	22

¹² Campbell, D.R. and Westcott, R. *The Gateway Effect*. Real Estate Investment Network. Retrieved June 3, 2006, from: <https://www.reincanada.com/>

In the five years since the last census was conducted, the trend of property prices growing more slowly along the Skytrain line than in other parts of Greater Vancouver may have reversed, as extensive new developments have been completed. This suggests that in the life of a transit project, 20 years may not be considered long term, and in subsequent years if road congestion continues to increase and fuel prices rise, locations along the Skytrain that provide close access to high quality rapid transit may increase more rapidly in value.

Finally, this analysis does not provide evidence that entirely contradicts the international experience of property price rises adjacent to transit stations as presented in the Real Estate Investment Network Study. This analysis of Vancouver was carried out on census tracts that are often larger than 500 meters in size and covered all census tracts adjacent to the line, and not only those areas directly next to station areas. This means that it is not possible to draw conclusions about the impact that close proximity to Skytrain stations specifically have on property values as was done in studies of other jurisdiction. A micro scale analysis may have found a price premium for properties located within 500 meters to the Expo Skytrain stations as compared to those further away in the same neighbourhood.

Despite the need for a finer grain analysis of property prices around station areas in particular, Skytrain stations and the above ground guideway upon which it travels in East Vancouver, Burnaby, New Westminster and Surrey are integrated into wider neighbourhoods and communities that extend beyond the areas directly adjacent to the transit stations. This analysis has presented the impact of Skytrain on property prices in these larger communities that have evolved around rapid transit facilities between 1981 and 2001.

Long Term Ridership

Amidst the intense development and community transformations that have occurred along the Expo Skytrain line, system ridership has experienced consistent growth. In 2003 the Skytrain system, which now included the Millennium line extension, carried 33.9 million riders, eclipsing for the first time the numbers of passengers carried during the Skytrain's first year of operation in 1986. This reflects a 59% increase in overall ridership on Skytrain since 1987, when patronage plummeted to a low of 21.3 million riders following the conclusion of Expo 86.

More recently since 2003, preliminary findings from the 2005 Skytrain survey reported in the UBC Area Transit Plan suggest that ridership growth on the Expo Line ranged from 15% and 20% between 2003 and 2005, while the region's transit system as a whole experienced growth of 19% during the period. With respect to commuting into the urban core, the frequent, fast and reliable service that Skytrain provides has contributed to overall reductions in the share of trips entering downtown that are made by automobile. It has been reported that with the current fleet of transit vehicles, the Skytrain system is operating near or at capacity during peak periods, and future ridership growth will need to be supported by planned fleet expansion.

B-Line Rapid Bus

The B-Line bus is the smallest scale rapid transit investment in Greater Vancouver. Implemented in some of the densest urban corridors in Greater Vancouver where future rail transit systems were planned, B-Line services were designed and communicated as extensions of the rapid transit network. Since the most recent 97 B-Line was only implemented quite recently, this section focuses on the longer-term experience with the 99 and 98 B-Lines.

99 B-Line

The first B-Line service was introduced in September of 1996, and designed to provide a limited stop connection between the University of British Columbia and Lougheed Mall in Burnaby while passing by the main uptown employment district along central Broadway. The 99 B-Line traveled along Tenth Avenue, Broadway, and Lougheed Highway, with bus frequency that ranged from 4 to 6 minute intervals. The service was initially operated using standard diesel buses, and a dedicated fleet of articulated low floor vehicles was subsequently purchased to serve the 99 B-Line route and painted with a unique color scheme. With the opening of the Millennium Skytrain line in late 2001 that travels from Lougheed Mall to Commercial Drive, the 99 B-Line now stops at Broadway and Commercial Drive.

The 99 B-Line was not equipped with any transit priority measures such as traffic light signal priority or a dedicated lane, and scheduling reliability was cited as an early challenge. As well, some initial concerns from local businesses about inconveniences caused by the location of bus shelters were addressed through ongoing consultations and small-scale remediation.¹³

Despite some of the early operational challenges of providing service along a busy transportation corridor in mixed traffic, the B-Line became quickly popular, and experienced rapid growth in ridership. As a service providing express transit access to UBC, the B-Line has a large student ridership base. Between the first year of operation in 1996-1997 and 2002, patronage grew from around 10,000 to 25,000 riders per day, a 150% increase. A year later, the introduction of a universal transit pass at UBC was attributed with increasing ridership on the 99-B Line by 36% to 34,000 passengers per day. This placed pressure on the capacity of the Broadway rapid bus line, which continued to be operated without any major transit priority measures such as dedicated bus lanes.

With respect to land use change, it is difficult to pinpoint precisely the degree to which the 99 B-Line has catalyzed property redevelopment along Broadway or Tenth Avenue. The 99 B-Line passes through numerous established neighbourhoods with distinctive local identities, which each have their own unique forces driving community change. At a wider scale, strong market demand for increased residential density in central Vancouver is likely the key force guiding development along the Broadway corridor.

In spite of the range of external forces promoting land use densification in central Vancouver, there is an observed pattern of redevelopment occurring near 99 B-Line stops. While not as pronounced in terms of attracting new residential density as along the Expo Skytrain line, at locations where the 99 B-Line stops, considerable redevelopment has occurred. At B-Line stops west of Macdonald Street such as Sasamat and Alma, new residential developments are typically 3 to 5 stories with retail on the ground floor. At Main/Kingsway and around Oak Street, larger residential towers are being developed. New shops, restaurants, and small galleries have also opened near stops on the 99-B Line, and many existing retailers have renovated their stores subsequent to increased bus rapid transit service being provided.

To this end, it appears that the rapid transit service provided by the 99 B-Line has contributed to catalyzing smaller scale developments that integrate into the existing urban fabric of each location, rather than the larger scale community transformations that are stimulated by larger

¹³ See for instance the administrative report to the Transportation and Traffic Committee of the City of Vancouver, from March 11, 1997, available online at: <http://www.city.vancouver.bc.ca/ctyclerk/ccclerk/970311/tt5.htm>

scale rapid transit investment. Market forces, as well as municipal land use planning and zoning regulations have likely reinforced the differential density of development when comparing the Skytrain and B-Line rapid transit services.

98 B-Line

In 2001, a second B-Line rapid bus service was introduced connecting Waterfront station in downtown Vancouver with Richmond Centre, and providing a connection for service to the Vancouver airport. The total capital cost of implementing the new B-Line service was around \$52 million. The 98 B-Line travels on a segregated transit only lane on Number 3 Road, which is landscaped to enhance the urban environment in the urban core of Richmond. On Granville in South Vancouver and through downtown Vancouver, the B-Line operates in mixed traffic.

The 98 B-Line is equipped with a range of high technology transit priority measures designed to improve service reliability and increase customer satisfaction. These include traffic signal priority measures, GPS based Automated Vehicle Location technology used to improve scheduling, and real time vehicle location information provided at stop locations.

A post implementation review by IBI Group studied the impacts of the 98 B-Line rapid bus. The review found that the transit priority measures implemented for the 98 B-Line slightly lowered total trip times, reduced trip variability by between 40% and 50%, had only minimal impact on the flow of general purpose automobile traffic, and reduced Carbon Dioxide emissions by an estimated 1,200 tonnes per year. As well, the customer information systems and frequent service implemented as part of the B-Line resulted in customer satisfaction ratings that often exceeded those for the transit system as a whole.¹⁴

In its first year of operation, the 98 B-Line carried 18,000 riders per day, which increased by 11% to 20,000 users per day the following year. A subsequent market research survey found that 31% of trips made on the 98 B-Line were new to transit, of which 23% were riders who used to travel by car as either a driver or passenger.¹⁵ And some 5 years after inauguration, in the districts of South Granville and Marpole where merchants and residents were concerned about street safety and the adverse impact of the new bus service on businesses, the neighbourhoods remain vibrant and safe.

In 2004, the success of the 98 B-Line was recognized through an award for innovation and exceptional performance from the Canadian Urban Transit Association. The 98 B-Line is being discontinued in 2010 when the new Canada Line is inaugurated, a factor that has likely limited the impact that the 98 B-Line has had on land use change.

¹⁴ IBI Group, "98 B-Line Bus Rapid Transit Evaluation Study" September 29, 2003.

¹⁵ Mills, B. (2004). Bus Rapid Transit in Vancouver: A Review of Experience. Available online at: <http://www.apta.com/research/info/briefings/documents/mills.pdf>

Conclusion: Implications for Future Rapid Transit Developments

In the past 30 years, the development of rapid transit has had a defining impact on the Greater Vancouver Region, a process that is in an ongoing state of transformation and plays out over an extend time horizon. In North Vancouver, the opening of the SeaBus served as an initial spark to stimulate the revitalization of the Lower Lonsdale District, which is still ongoing. In certain locations in each of the municipalities through which the Skytrain passes, it has catalyzed community revitalization and residential densification of land use adjacent to transit facilities, in accordance with the objectives established in the *Livable Region Plan*. In other locations, there remain station areas along the Expo Skytrain line that have not yet experienced any new transit oriented development. And around B-Line stops, particularly on the Broadway corridor, smaller scale infill developments have been carried out. While residential development has clustered around many rapid transit stations, outside of central Vancouver, dense commercial activity has been developed in only a few transit-oriented locations – at Metrotown, Lower Lonsdale, and more recently in parts of Central Surrey. The overall experience with the SeaBus, Skytrain and B-Line suggests that rapid transit is one powerful factor among many that determine where and when new development will occur. Wider market supply and demand is also important in determining the specific location and timing of new development.

Overall, long term ridership figures on each component of the rapid transit network suggest that while dense residential development surrounding station areas has supported transit usage for certain types of trips, simply attracting new development directly adjacent to high quality fixed rapid transit lines does not necessarily guarantee growth in transit ridership that exceeds the rate of change across the entire system. Micro factors such as access to available parking in new residential facilities and perceived safety surrounding rapid transit facilities, and macro factors such as regional shifts in workplace locations and transit fares are also important drivers of transit usage.

To this end, proactive land use planning and community consultation during the early phases of the rapid transit project development process are critical to complement ongoing market forces that direct the real estate industry. Both land use planning and market forces contribute to defining the form of development that best integrates with the existing community surroundings, and serve to maximize the advantages of increased transit accessibility.