

**IMPROVING TRANSIT FACILITIES THROUGH
LAND USE PLANNING AND URBAN DESIGN**

by

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ABSTRACT

Transit trips include four parts: the trip from the front door to the transit stop; the wait at the transit stop for the transit vehicle; the transit ride; and the trip from the transit drop off point to the final destination. This thesis explores methods of improving the pedestrian trips to and from the transit stop and the waiting period at the transit stop.

People are not satisfied with their transit trips. People want better quality waiting areas, increased safety, comfortable surroundings, transit information, and convenience during the transit trip.

This thesis explores the positive relationship between the quality of public streets and transit facilities, and ridership satisfaction. The thesis proposes that the transit trip can be improved by improving transit waiting areas, and the paths people take arriving at and departing from transit stops.

BC Transit's Vancouver Regional Transit System's transit facilities are the focus of the study. Transit facilities include: bus stops, bus loops, bus exchanges, SkyTrain stations, and SeaBus terminals.

The study reviews people's attitudes towards transit facilities and discusses the items that people consider important to a transit trip. This review includes a survey conducted by the author and a review of surveys conducted for BC Transit.

A review of the literature provides further evidence on the basic requirements for transit facilities and a comparison is made with the local situation.

The thesis explores the potential for land use planning, urban design and on-site design to improve the safety, comfort, and convenience of transit facilities.

The role of BC Transit, in providing adequate transit facilities, is discussed along with the roles and responsibilities of other associated organizations including: the Province, the Greater Vancouver Regional District, municipal governments located within the Vancouver Region, private enterprise, and business improvement districts.

The study concludes BC Transit should give more thought to the transit customer in the design and location of transit facilities. And that municipal governments must take action to improve the quality of streets and transit facilities in their own communities.

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PART ONE

INTRODUCTION

1.0 Introduction to the Thesis Topic

The New York Transit Authority's motto of "We Get You There," sums it up. For a dollar you get a one way passage, but that's about it.¹

This thesis topic evolved from my observation of the Vancouver transit system and the lack of comfortable waiting areas for transit riders. After using the local system for two years, and discussing it with many fellow transit riders, I became curious as to how this aspect of the BC Transit system could be improved.

Neglect of the transit waiting areas stems from a common misconception that a transit trip is only the time spent riding transit. Transit trips include four parts: the trip from the front door to the transit stop; the wait at the transit stop for the transit vehicle; the transit ride; and the trip from the transit drop off point to the final destination.² The time spent outside of the transit ride is an important part of the total transit trip.

This thesis looks at the problems with the areas used by transit customers on their way to and from transit stops, and at the potential methods of improving the transit environment.

Discussion does not focus on a single mode of transit (bus or trains). This is done for two reasons: BC Transit is an integrated system that allows the transit rider to transfer between buses, SkyTrain, and the SeaBus; and secondly, because the principles discussed in this thesis should be applicable to all aspects of the transit system.

The thesis begins with a discussion of people's concerns with the transit trip. Discussion then turns to the different methods of addressing these concerns through planning and design. A summation is presented through a discussion of the different groups involved in implementing the plans that address the concerns.

1.1 Background to the Thesis

Increasing the overall use of mass transit, and consequently, reducing the use of the private automobile, is considered by many to be a necessary component to reducing our environmental problems, as well as solving rush hour gridlock.

The Brundlant Report, Our Common Future, discusses the need for people to reduce their use of finite resources such as fossil fuels, if we are to move towards a sustainable future.² Mark Roseland's resource book, Toward Sustainable Communities, acknowledges transit's role in providing a more environmentally efficient method of transportation.³ "Going Green" has become a familiar slogan that suggests travelling by transit or other sustainable alternative to the private automobile. In addition, mass transit is proposed as the solution to our congested highways, and as a means of reducing the future need for

additional roadways.⁴

A policy of reversing the practice of favouring the private automobile was adopted by the local municipalities under the Greater Vancouver Regional District's "Creating Our Future" program. This policy forms part of the Transport 2021 plan, a regional transportation study developed by the Greater Vancouver Regional District.⁵

The Government of British Columbia undertook responsibility for providing mass transit in 1978, with the creation of BC Transit. BC Transit, a crown corporation, is working towards an improved transit system, and increased ridership levels. To this end, BC Transit commissions studies and surveys on transit riders' usage and attitude of the transit system. The findings show that one method of increasing ridership is to provide high quality customer service.⁶

The ways of improving the quality of service vary from training staff to be more polite, to increasing frequency of bus service. This thesis proposes that one method of improving transit is to improve the areas that transit riders use, so that the waiting areas and pathways leading to transit stops, are safer, more comfortable, and generally more enticing to potential transit users.

There is a broad variety of recommendations to be found in the literature on how the design of transit facilities (bus stops, bus loops, stations, and terminals) can be improved. Most authors focus on a single aspect of transit design, such as improving the safety of

a bus stop, or improving the design of a transit station. This material will be covered in the chapters that follow.

A few authors have taken a broader perspective. One such group is Beimborn, Rabinowitz, Lindquest and Oppen, from the University of Wisconsin, who have written on the need for a "market-based approach to transit facility design." Their studies suggest a need for transit planning that plans for the customers:

An understanding of the market and how to serve it should manifest itself in station planning and design, as well as in the areas around stations. Quality design will create use both for transit and development with a benefit to both public and private activities.⁷

Other authors, who take a broader perspective, come from the architectural or planning disciplines. They stress, as do Beimborn and his associates, the need for transit planning to incorporate the principles of design and site planning. Architecture magazine devoted an issue to mass transit design in August 1993. In that issue the Jane Holtz Kay commented:

the architects of the light rail systems appearing on these pages pay careful attention to public safety - with a quest for light and visibility - and public amenities, from brick walks to brisk graphics, from benches to street lights. These efforts create congenial urban streetscapes designed to attract riders. Pedestrian surroundings invite the walk to the station and hence make the trip between work and home, between commercial and cultural life alluring.⁸

It is difficult to quantify the degree to which transit ridership might increase if the quality of public streets and transit facilities improve. BC Transit, and other mass transit experts, suggest that conservative increases in ridership may result from better design of transit

facilities.

More importantly, an improvement in the quality of public streets and waiting areas will improve the quality of the transit trip for the rider, improving their quality of life, and the likelihood for them to continue using transit.

1.2 Preliminary Investigation of the Thesis Topic

This thesis topic required research to determine whether or not other transit riders were unsatisfied with the quality of the transit facilities and if there was a possibility for improvements to lead to increased ridership and transit use.

This section outlines my initial findings.

i) Personal Experience

Since 1991, when I moved to Vancouver, I have been using the BC Transit system. I have noticed the lack of basic amenities at most of the stops and stations, including a lack of seating, shelter, lighting, garbage cans, and newspaper machines.

ii) Student Survey

In 1993, I conducted a survey of forty University of British Columbia students to determine what people felt about transit facilities. (See Appendix I.) The results were in keeping with my thesis proposal that people were not satisfied with the existing transit facilities.

The fifth question on the survey asked people to list things that came to mind as being good or bad about bus stops, bus loops, SkyTrain stations and the SeaBus terminals.

Thirty nine of the forty respondents commented on problems with transit waiting areas.

Here is an example of the results received for bus stops:

- 26 people want some or better shelter from the wind, rain and in one case, sun.
- 9 people want places to sit (dry benches are preferred)
- 9 people want better lighting at the bus stops
- 8 people want schedule information
- 5 people want garbage cans
- 5 people note the level of vandalism
- 3 people note the dirtiness of the bus stops
- 3 people note the isolation of the bus stops
- 2 people note getting splashed while waiting for the bus
- 2 people find the stops inconveniently located

The survey continued with similar results for bus loops, SkyTrain Stations, and the SeaBus.

Question twelve asked, "Do you feel that the design of transit stations makes a noticeable difference to the quality of your trip?" Seventeen people (42.5%) responded that it makes a big difference, fifteen people (37.5%) said that it makes some difference, and only eight people (20%) said that it made no difference at all to the quality of their transit trip.

The survey results indicated that transit users had noticed problems with transit facilities and wanted to see them improved.

iii) BC Transit Survey Results

The Angus Reid Group regularly conducts surveys of BC Transit rider's satisfaction, usage and attitude towards the transit system. These surveys are designed to focus questions on the transit ride, and they provide useful information on the potential for improving the transit system.

BC Transit surveys show that transit use accounts for 13% of all trips made in the Lower Mainland.⁹ This figure is quite low, and demonstrates the potential for an increase in ridership.¹⁰

Table 1.1 Transportation in the Vancouver Region	
Mode	Percent
Transit	13%
Automobile (single occupant)	46%
Automobile (multiple occupants)	32%
Walking, Cycling, and other	9%
Source:	BC Transit, <u>The Market: Our Customers and What They Expect From Transit</u> , p. 2.

17% of transit riders use transit regularly and they account for 76% of all weekday transit

trips. 31% are moderate users and 52% are light users. Light and moderate transit users provide an opportunity to increase ridership. People who have used transit are more easily persuaded to use transit again than people who have never used transit.¹¹

Satisfaction rates for the quality of the transit system are respectable but illustrate plenty of room for improvement. Of the riders surveyed, 9% rated the system "unsatisfactory," and 33% rated it only "satisfactory," the remaining 58% found the system either "quite good" or "very good". Non-riders generally rated the system more harshly, with 22% finding it "unsatisfactory" and 37% finding it only "satisfactory."¹²

Combined these statistics show that the public is not completely satisfied with the current transit system and that there is room for improvement. Furthermore, transit use accounts for a small percentage of all trips, even though 50% of the public are light or moderate users of mass transit.¹³ This suggests that there are plenty of potential riders who are familiar with the transit system but have reservations about using it regularly.

iv) Experience as a Municipal Planner

Over the past year and a half, I have been employed with the City of Surrey. In my position as a Current Planner, I have been able to analyse the City's relationship with BC Transit, and the degree to which Surrey plans for transit. I have found that there is almost no thought given to mass transit by anyone in the Planning or Engineering Departments.

The Planning Department does not even have route maps of the local bus system for reference purposes.

Based on this information, I am convinced that the BC Transit system in the Vancouver region needs to improve its transit facilities and the areas around them in order to satisfy the transit users.

1.3 BC Transit

The mission of BC Transit is to enhance the social and economic life of the communities it serves by providing safe, reliable, effective, and environmentally sensitive public transit.¹⁴

BC Transit is a crown corporation that was established in 1978. Its responsibilities are set out in the British Columbia Transit Act. BC Transit is responsible for transit systems throughout the province including the Victoria and Vancouver areas.

This thesis will focus on the Vancouver Regional Transit System, a branch of BC Transit. BC Transit's Vancouver Regional Transit System serves the Greater Vancouver Regional District, and extends into the adjacent communities of Pitt Meadows, and Lions Bay. In the

1993-94 fiscal year, the system served 105 million passengers and 350,000 people each weekday.¹⁵

BC Transit's vehicle fleet in the Vancouver region includes 1000 buses, 130 SkyTrain cars, and two SeaBuses.¹⁶ All modes of transit are integrated so that passengers can use one or more types of transportation on a single ticket.

There are 177 bus routes and over 7,600 bus stops throughout the Vancouver area. Approximately 115 routes connect with SkyTrain stations. There are 20 SkyTrain stations and two SeaBus terminals.

Bus routes in the Lower Mainland divide into two types of route networks; the grid and the focal point.

The grid system is used primarily in Vancouver, an urban area with relatively high population density. Grid routes can run parallel, 800 metres apart in north-south or east-west directions. This type of route is based on research that shows transit users are willing to walk up to 450 metres to catch a bus (about a five minute walk).¹⁷

The second type of system is the focal point network that is used in lower density suburban areas. In a focal point system routes converge at key points; town centres, major malls, and SkyTrain stations. At these central points, routes converge at coordinated timed intervals so that passengers may conveniently change buses and travel to other suburban

destinations.

The BC Transit system is soon to be expanded to include a commuter rail system running 65 kilometres from Mission to Vancouver. This rail system is anticipated to open in late 1995. It will have eight stations which will be integrated into the local BC Transit service.

The BC Transit system also includes an extensive "dial-a-ride" operation that uses 189 handyDART vehicles to serve 22,000 people currently registered in the program. The handyDART system provides door to door service for people who are unable to ride conventional buses due to a disability. The system provides approximately 800,000 rides per year.

The handyDART service is the only portion of BC Transit's local service not discussed in this thesis. Its omission is due to the nature of handyDART service, which is a door to door service and therefore does not require waiting areas.

Chapter One Endnotes

1. Steven Holt, "Underground Design," Industrial Design 31 (November / December 1984), p. 34.
2. BC Transit has initiated a "Request Stop" program which allows bus passengers in the evening to disembark at a convenient location along a transit route. This system is not well advertised and is rarely used. The request stop program has the potential to reduce the walk between the drop-off point and the final destination but does not eliminate the walk completely.
3. World Commission on Environment and Development, Our Common Future (New York: Oxford University Press, 1987).
4. Mark Roseland, Toward Sustainable Communities (Ottawa: National Round Table on the Environment and the Economy, 1992).
5. Edward Biemborn et al., Measurement of Transit Benefits (Washington, D.C.: Urban Mass Transportation Administration, 1993).
6. Greater Vancouver Regional District, A Long Range Transportation Plan for Greater Vancouver Transport 2021 Report (Burnaby: Greater Vancouver Regional District, 1993), p. i.
7. BC Transit, BC Transit 1993/4 Marketing Plan in house report (Surrey, 1993).
8. Edward Biemborn et al., Market Based Approach to Transit Facility Design (Washington D.C.: Urban Mass Transportation Administration, 1990), p. 163.
9. Jane Holtz Kay, "Streetcars of Desire," Architecture (August, 1993), p. 60.
10. The Greater Vancouver Regional District estimates that transit use only accounts for 9% of all transit trips - 4% less than BC Transit's figure.
11. BC Transit, The Market: Our Customers and What they Expect From Transit (Vancouver: BC Transit, 1992), p. 2.
12. Ibid., p. 4.
13. Ibid., p. 9.
14. Ibid., p. 4.
15. BC Transit, Welcome to BC Transit (Surrey: BC Transit, 1995 draft document), p. 18.
16. Ibid., p. 46.
17. Ibid., p.36.

2.0 METHODOLOGY

This thesis poses the question, how can the transit trip, as experienced by the user, be improved?

The study begins by reviewing five key concerns that the public has with the transit trip: safety, comfort, information, access and boredom.

In the next section the thesis turns to the steps in the planning process that can be used to address the transit users' concerns. These steps or stages in planning start with land use decisions continue with urban design, and end with analysis of on-site design. Each stage is reviewed in terms of its potential to improve the transit experience for the transit patron.

Thirdly, the thesis discusses the groups who are affected by transit use, and have a reason to work toward improving transit. These groups are the people who will be able to implement the planning choices discussed in the second section, to address the transit users' concerns that are discussed in the first section. The groups are: the Province, The Greater Vancouver Regional District, the local municipalities, private enterprise, business improvement districts, and BC Transit.

The thesis ends with conclusions of the merits and methods of improving the transit trip.

and provides a summary of the recommendations included in the report.

The thesis is based on four different types of research. A survey of University of British Columbia students was done to obtain information on transit riders opinions of the transit trip and transit facilities. A review of BC Transit documentation was completed to provide information on the local transit system. An extensive review of the literature was conducted to obtain information on alternative methods of providing better quality transit trips and find potential solutions for the local situation. And lastly, a series of interviews were conducted to obtain information on how planners are involved in transit planning locally and in Seattle and Portland.

PART TWO

COMMON CONCERNS

Introduction to Part Two

Transit should be user friendly. It should be clean, safe, accessible, secure, informative and comfortable. Transit systems need to overcome traditional negative images. A strong, positive system identity is needed. Facilities design must consider passenger safety and security as well as comfort; while passenger mobility needs are accommodated in accordance with local and national policies. Positive steps are needed to present an attractive image for the services provided and information provided passengers should help them to easily find their way through the system.¹

Part Two of the thesis discusses the concerns people have with the transit trip. Those concerns are safety, comfort, information, accessibility and boredom. Some of these concerns apply to the pedestrian portions of the transit trip as people make their way to and from transit stops. Other concerns relate more to the waiting period and the transit facility. And some concerns relate to both the pedestrian trips and the waiting period.

Each chapter will address the public perception of the problem, the existing situation, and any studies or work that is underway in an attempt to address the concerns.

3.0 CRIME AND SAFETY

3.1 Introduction

This chapter is about the level of crime and the degree of safety perceived by transit users.

The chapter will focus on transit facilities. Discussion will not detail the methods of reducing crime on the streets because it is beyond the scope of this thesis.

The chapter begins with a review of surveys of transit riders and the general public to discover people's perception of safety and crime as it relates to transit. These results illustrate the degree to which people are afraid of crime, and will provide insight into why people avoid using transit.

The second section looks at the crime rates for the region and the crime statistics for transit related offenses. It is evident that crime is a problem that affects transit and transit use.

The third section reviews three reports done in the past three years on transit safety. The first report is based on a series of safety audits done by the Vancouver Safer City Task Force in 1992. The second report is an internal review of safety and security from BC Transit's Security Department. The third report, by the BC Transit Safer City Task Force Committee, includes comments on the first two reports. Finally, the three reports'

recommendations for crime reduction are discussed.

3.2 The Perception of Fear on Transit

In 1992 BC Transit requested that their survey consultant, the Angus Reid Group, add questions concerning the level of fear of crime to the regular surveys done for the transit system. Accordingly, the March 1992 "Usage and Attitude" survey included questions on public safety. The results indicated that 41% of the public (transit users and non-transit users) have concerns about personal safety while taking a transit trip.²

Similarly, in May of 1992, additional questions on personal safety were added to the "BC Transit Rider Satisfaction Survey" also conducted by the Angus Reid Group. The results clearly show a concern for personal safety by the transit user. 17% of transit users were concerned for their personal safety while riding on public transit. 25% were concerned for their personal safety while waiting at a transit stop, loop or station, and 20% expressed concern for their safety while walking to and from transit.³

Though this area of research has not been widely explored by the public transportation industry, there are some published studies that show similar levels of concern by transit users. One such study was done on the Detroit public transit system which came up with the following results. When asked whether or not they felt safe while riding the bus, 41.6% said yes, 23% said sometimes, and 35.4% did not feel safe. When asked whether or not

transit users felt safe while waiting at the bus stops, only 31.1% said yes, 16.2% said sometimes, and 52.7% did not feel safe.⁴

This Detroit study went on to ask survey participants what were the most important factors in determining their level of public transit use. 44.4% stated that fear of crime was the most important issue (more important than scheduling, fares and comfort), and an additional 18.9% stated that fear of crime was the second most important factor in determining personal use of public transit.⁵

People are afraid of becoming a victim of crime while using transit. Fear makes people avoid using transit, or makes people modify their transit use to reduce the risk of attack.

For many people this means reducing their use of transit in the evening or avoiding particular transit routes.

BC Transit has begun to recognize the impact that fear has on potential ridership levels, as demonstrated in this statement:

Regarding crime and personal security, it is the perceived level of crime and risk to one's personal security, not the actual level of crime, or risk which influences a person's pattern of transit use. If a customer feels unsafe or experiences some level of fear when using public transit, then, for all practical purposes, the system is unsafe. A person's perception may certainly influence his/her decision whether or not to use public transit.⁶

3.3 Levels of Crime on Transit

Transit crime is not independent of the community it serves, but is closely related to the level of crime in the surrounding region.⁷ This makes sense when one remembers that transit trips include periods of time walking through neighbourhoods on the way to transit, and waiting on city streets for transit to arrive.

Crime rates for the region are based on the number of criminal offenses that occur within one year divided by the population of the jurisdiction to obtain crime rate per one thousand people per year. The crime rate in the Lower Mainland area varies from a low of 99 criminal code offenses per 1000 population in the District of North Vancouver to a high of 232 criminal code offenses per 1000 population in City of New Westminster.⁸ The average rate for the Greater Vancouver Regional District in 1992 was 148 offenses per 1000 population.

The regional crime rate provides a yardstick for the level of crime that occurs in the areas that BC Transit operates. Crime statistics collected by local police departments do not differentiate between crimes that involve transit patrons and ones that do not. Nor do police records indicate whether or not a criminal offence occurred at a transit facility or along a transit route. Furthermore, crime rates are based on population levels, and BC Transit does not have a static population. Therefore, the regional crime rate though useful cannot be applied directly to BC Transit.

BC Transit maintains its own statistics on the number of crimes that occur on transit. These statistics are based on incidents that are reported to BC Transit security staff. BC Transit is of the opinion that these statistics under represent the true level of crime, as many crimes are reported directly to the local police departments or not reported at all. Police records are not filed in such a way that transit staff can access reports on crimes occurring at or near transit stops and stations. This problem is exacerbated by the number of police departments that operate within the Vancouver transit region:

The Vancouver Regional Transit System (VRTS) covers an area policed by 17 separate police jurisdictions, including Royal Canadian Mounted Police detachments. The SkyTrain system alone passes through four jurisdictions: Surrey Royal Canadian Mounted Police (RCMP); New Westminster Police Department; Burnaby RCMP; and the Vancouver City Police Department.⁹

A second problem with the compilation of transit related crime statistics is the issue of how transit is defined. Crimes that occur while people are waiting for transit or while people are on their way to transit, are not always associated with public transit. BC Transit does recognize these crimes as transit crimes as they state:

Transit crimes don't occur just on transit controlled facilities such as buses, trains and at stations; at least not in the eyes of the victim, and also the perpetrator. Research has shown that most "transit" crimes occurs either while waiting for a transit vehicle or during the trip between the transit facility and the destination.¹⁰

For example, Jesse Cadman, a Surrey teenager, was on his way home from the bus stop in 1992, when he was attacked and killed.¹¹ Most newspaper reports referred to this as a senseless example of youth violence, and not as an example of transit violence.

BC Transit's crime statistics also have a built in bias. Crimes that affect transit users are often reported directly to the local police, or not reported at all. However, BC Transit staff are required to report all crimes and incidents that they witness or are involved in. These

statistics therefore include less serious assaults such as verbal abuse and being spat at.

The following table shows the total incidence of criminal code offenses occurring in the vicinity of BC Transit between 1988 and 1992 as compiled by BC Transit's Security Department. These statistics are followed by the ridership levels for those years as prepared by BC Transit's Marketing Department. These figures are then divided to obtain a crime rate per thousand transit trips, to show the tendency for crime on the transit system over the past few years.

Table 3.1 BC Transit Annual Crime Statistics					
Year	1988	1989	1990	1991	1992
Criminal Offenses	1609	1592	1829	1765	1720
Ridership (million)	104.828	110.075	121.216	126.701	130.634
Crime Rate ¹²	.0149	.0142	.0149	.0139	.0131
Source: BC Transit, <u>Operation Safeguard: BC Transit's Review of Employee and Passenger Safety and Security</u> , p. 13-14.					

This review of local crime statistics shows that in 1992 the Vancouver Region had an average crime rate of 148 criminal offenses per one thousand people, and that there were at least 1,720 criminal offenses committed on the transit system that same year.

Crime does occur in the Vancouver Region and it occurs on and near transit facilities as it does elsewhere in the community.

3.4 Studies of BC Transit Safety

Three studies of safety and transit have been done in the last three years. These studies attempted to provide some insight into security problems associated with transit service. The first study to be done was a series of safety audits initiated by Vancouver's Safer City Task Force.

The Safer City Task force introduced a pilot project to assess the safety levels of local transit in 1992. That project was based on the idea of conducting safety audits at 35 local transit facilities. The format of the safety audits was largely based on the work done by a Toronto group known as METRAC, Metro Action Committee on Public Violence Against Women and Children, in their publication titled, Moving Forward: Making Transit Safer for Women.¹³

A safety audit is defined as a close inspection of an indoor or outdoor environment for safety concerns.¹⁴ Safety audits allow for public input on design problems that might result in dangerous or uncomfortable situations. Safety audits were introduced in Vancouver approximately three years ago by the Safer City Task Force and the Royal Canadian Mounted Police (RCMP). Though new to Vancouver, safety audits have been used more extensively in other Canadian cities including, Winnipeg, Toronto and Scarborough.

The results of the Safer City Task Force safety audits were published by the City of

Vancouver in a report titled Safety Steps for Transit. In that report they state:

The Safety audit provides an appropriate measure for passenger comfort and security. The process allows citizens to articulate safety concerns which may be overlooked in planning and designing a transit location. For example, audit results include the concerns of those who often are, and generally feel, more vulnerable to victimization, such as people with disabilities, women, and the elderly. Overall, the feeling of safety and comfort of passengers is a very important issue. The public's perception of security on a transit system potentially has an impact on ridership levels and, more importantly, on the ability to move around the city without fear.¹⁵



Figure 3.1
Nanaimo SkyTrain Station

Both Figure 3.1 and 3.2 illustrate the blind corners and potential hiding spots that are found in many SkyTrain station designs.

The Safer City Task Force safety audit study resulted in a list of proposed changes to the existing transit stops and stations that were audited. The proposals were made in the form

of general recommendations that could be applied to the entire transit system, with reference to specific examples. This study focused on the existing built form, and consequently many of the recommendations are proposed improvements to the design of these transit facilities. Among the design related recommendations were the following proposals:

1. Install transparent materials in transit shelters found at bus stops and bus loops.
2. Install security mirrors to enable passengers to see around corners, and in other potential hiding spots.
3. Add pay phones or other emergency assistance systems to bus stops.
4. Create a "designated waiting area" on SkyTrain platforms that could be closely monitored.
5. Install outside surveillance cameras at SkyTrain stations.
6. Increase lighting requirements in isolated areas.
7. Improve signs at bus shelters, loops, and stops.
8. Develop clear emergency information signs.
9. Develop symbols for signs.
10. Ensure adequate maintenance of landscaping surrounding transit stops.



Figure 3.2

Broadway SkyTrain Station

Another blind corner that adds to the anxiety of transit riders.

The report also included recommendations for: additional research into transit crime; additional training programs for transit personnel; developing community ties, to allow for public input into transit design; public education, to increase awareness of security programs; and policy and planning initiatives that allow for Crime Prevention Through Environmental Design principles to be applied to transit facilities.

While the Safer City Task Force was working on their report BC Transit initiated their own security review. The review's findings were compiled in a report titled, Operation

Safeguard: BC Transit's Review of Employee and Passenger Safety and Security.

The report presented the statistics on transit crime, and the problems associated with the statistics (see section 3.2). To find out more about the incidence of crime on transit the report made six recommendations for improving methods of obtaining crime data.

The report reviewed the role that BC Transit staff played in both preventing crime and being involved in crime. Twenty-four recommendations were made in relation to BC Transit staff. General recommendations were made for additional training (conflict resolution and negotiation, and victim assistance), improved and new equipment (radios, and protective screens), new staff recruitment requirements (adding social skills to the requirements for front-line staff), and increased surveillance through additional security personnel.

In the review of passenger safety, emphasis was placed on improving the design of transit facilities and increasing the degree of surveillance by security personnel. Twenty-five recommendations relating to passenger safety included: data collection on passenger related crimes, studies on design improvements, the use of Crime Prevention Through Environmental Design principles in the planning and development of future transit facilities, further evaluation of the Safer City Task Force's recommendations, and policy updates to include passenger safety as a transit goal.

The two reports, Operation Safeguard and Safety Steps for Transit were brought together

in the report of the BC Transit Safer City Task Force Committee, of August 21, 1994. In preparing this report the BC Transit Safer City Task Force Committee, worked with a public interest group known as TUGS:

In 1992, a volunteer group of regular transit users formed the Transit Users Group on Safety (T.U.G.S.). T.U.G.S. was formed as an outgrowth of public concern for personal safety on public transit, and is committed to improving personal safety on the system... T.U.G.S.' representatives participated on the City's Safer City Task Force and were approached by Transit's Safer City Task Force Committee for input. In March 1994, this group accompanied the Committee on a tour of several SkyTrain stations to elaborate on its concerns.¹⁶

Using the findings of the first two reports, the report, presented by the BC Transit Safer City Task Force Committee, proposed methods of analysing and implementing the recommendations of the prior reports.

The report made only two recommendations. The first recommendation was titled "improvement of the physical environment," and recommended following Crime Prevention Through Environmental Design (CPTED) or similar principles to correct design deficiencies, including those mentioned in the original Safer City Task Force Safety Audit. The second recommendation was titled, "development of policies and processes for the ongoing provision of safe and secure service," and suggested establishing policies so that standards could be set, and accurate data gathered.

The two recommendations were followed by endorsements of other BC Transit initiatives including, a staff training program, crime data collection project and the hiring of additional security personnel. The third report was unique in taking the recommendations one step

further and outlining a plan for implementing these proposals including a review of costs, and cost recovery.

3.5 Analysis of Results

It is clear from the surveys conducted by the Angus Reid Group for BC Transit that the general public (transit users and non-users) is concerned about safety while taking a transit trip. Transit users are concerned about safety while walking to a transit stop, while waiting at a transit stop and while on transit.

It is also evident from the crime statistics that crime does occur on and near transit, as it does elsewhere in the general community. Given the occurrence of criminal activity it is evident that BC Transit does have a problem with crime.

Three studies looked at this problem and came up with recommended methods of reducing crime on and about transit. All three studies stressed the importance of design and the need to follow Crime Prevention Through Environmental Design (CPTED) principles.

The concept, that design can minimize the occurrence of crime, comes from the new field in criminology known as Crime Prevention Through Environmental Design (CPTED). At the Crime and the Urban Environment Conference held at Simon Fraser University in 1994 it was described more fully:

In the past 25 years, there has been a growing awareness that cities can be made safer from crime by designing safer urban places. This concept began with the

ideas of how the principles of defensible space, surveillance, and territoriality could achieve this objective. The application of these principles became known as Crime Prevention Through Environmental Design (CPTED). As the field has developed, it has been found that design influences fear of crime, actual crime, nuisance problems, and how people use public space.¹⁷

The study of CPTED is based on research that has shown that most crime is committed by normal people who see a chance and take it.

[T]he bulk of crime - vandalism, auto-crime, shop-lifting, theft by employees - is committed by people who would not ordinarily be thought of as criminal at all.¹⁸

Ordinary people do not go out of their way to commit crimes. If an area is designed so that it is difficult to commit a crime, fewer opportunities for crime will present themselves, and less crime will be committed.

Methods of deterring crime through design fall into two categories, those that reduce the physical opportunity for a crime to occur, and those that increase the chance of the criminal being caught. In practice, a design that lessens the opportunity to commit crime is also one that increases the capture rate. For example, suitable lighting is considered important in decreasing the chance for a crime to occur, but it also aids in surveillance of the area, and increases the chance of a criminal being seen and caught.¹⁹

All three studies recognized that design improvements could reduce both real and perceived levels of transit crime and proposed a variety of improvements to existing and proposed facilities. The following excerpt is from the BC Transit Safer City Task Force Committee report:

While BC Transit generally provides safe, secure service to its customers, there are many opportunities for improvement...including: the elimination of isolation / entrapment areas and the implementation of environmental design principles; the implementation of designated waiting areas; the provision of adequate lighting and signage; ensuring unimpeded sightlines, and the installation of emergency communication systems.²⁰

Physical improvements to transit facilities were the focus of the first report, Safety Steps for Transit, and were key aspects of all three reports. However, each report recognized that design was only part of the solution. The reports were in agreement on the need for surveillance of waiting areas to back up good designs.

Jane Jacobs wrote the following about the relationship between aspects of good design and surveillance:

The value of bright street lights for dispirited grey areas rises from the reassurance they offer to some people who need to go out on the sidewalk, or would like to, but lacking the good light would not do so. Thus the lights induce these people to contribute their own eyes to the upkeep of the street. Moreover, as is obvious, good lighting augments every pair of eyes, makes the eyes count for more because their range is greater. Each additional pair of eyes, and every increase in their range, is that much to the good for dull grey areas. But unless the eyes are there, and unless in the brains behind those eyes is the almost unconscious reassurance of general street support in upholding civilization, lights can do no good. Horrifying public crimes can, and do, occur in well lighted subway stations when no effective eyes are present. They virtually never occur in darkened theatres where many people and eyes are present. Street lights can be like that famous stone that falls in the desert where there are no ears to hear. Does it make a noise? Without effective eyes to see, does a light cast light? Not for practical purposes.²¹

Surveillance was discussed in three reports as the job of the local police, transit constables, security officers and other transit officials. In the BC Transit report, Operation Safeguard, mention was made of a program in Ottawa, called Transecure. Transecure involves Ottawa transit drivers in surveillance similar to a neighbourhood watch program.

All drivers are encouraged to use their radios to report suspicious occurrences, emergencies, and criminal activity. To date the Transecure program has not been adopted by BC Transit.

The concept of unofficial surveillance was touched on in the discussions of isolation and design improvements, but it was not recognized as both a necessary and beneficial form of security.

Unofficial surveillance is conducted by passers by, fellow transit users, and by members of the neighbourhood, all of whom serve as deterrents, witnesses, and potential providers of emergency assistance. This can be aided by design choices which increase the potential for transit users to be seen by other people, and which provide the means of summoning help.

This type of surveillance has been widely recognized as important to the overall level of crime, and perception of crime. Jane Jacobs is credited with bringing the notion of casual surveillance or "eyes on the streets" to the fore with her 1961 book, the Death and Life of Great American Cities, in it she writes:

The first thing to understand is that the public peace -the sidewalk and street peace - of cities is not kept primarily by the police, necessary as police are. It is kept primarily by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves.²²

The importance of surveillance in the transit context has been more recently studied by

Mancini and Jain, in a study where lack of surveillance, isolation from public view, and low activity in the area were recognized as important factors in the rates of vandalism at commuter parking lots.²³

Finally, the reports recognized that fighting crime requires a joint effort between local police departments, local governments, and BC Transit.

Policies and processes can only be improved effectively through the collaborative efforts of other agencies, municipalities, and organizations who share the responsibility for safety and security of transit customers.²⁴

Despite this recognition of the need for a joint effort, none of the three reports explored this topic or suggested methods of developing associations and partnerships with the different agencies mentioned.

3.6 Conclusions

Transit crime is a problem that needs to be addressed by BC Transit and local police forces so that the general public can travel more safely and feel more secure while they do so.

Reducing the level of crime can be achieved by: improving the design of transit facilities; increasing surveillance; and through a collaborative effort with municipal governments, police forces and BC Transit.

Three reports have been submitted to BC Transit, each of which has proposed basic recommendations for how the current system can be improved. The last report followed the recommendations with a detailed list of the costs and actions required to follow up the proposed recommendations. Despite this there is little evidence of any changes to the existing transit system though most of the problems remain.

Chapter 3.0 Endnotes

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2. Angus Reid Group, Inc. BC Transit 1992 Usage and Attitude Study, Market Research Report, (Vancouver: March, 1992).
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5. Ibid., p. 113.
6. BC Transit, Operation Safeguard: BC Transit's Review of Employee and Passenger Safety and Security (Vancouver: BC Transit, 1993), p. 16.
7. BC Transit Safer City Task Force Committee, Safer City Task Force Committee Report (Vancouver: BC Transit, August 31, 1994), p. 8.
8. Police Services Branch, Municipal Crime Ratio Data, (Victoria: Government Publications, 1992).
9. BC Transit, Operation Safeguard, p. 7.
10. Ibid., p. 57.
11. Mary Lynn Young, "Sixteen-year-old stabbed to death in attack just blocks from home," *The Vancouver Sun*, October 19, 1992, p.A1.
12. The crime rate is based on rides and not on population and therefore it is not possible to compare it with local crime rates. Furthermore, the probability of becoming a victim of transit crime increases with the more transit rides taken.
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14. Surrey Safety Audit Project, Surrey Safety Audit Guide (Surrey, 1994), p. 1.
15. Vancouver Safer City Task Force, Safety Steps for Transit, p. 1.
16. BC Transit Safer City Task Force Committee, Safer City Task Force Committee Report (Vancouver: BC Transit, August 31, 1994), p. 10.
17. Simon Fraser University, Papers from the *Crime and Safety in the Urban Environment Conference* (Vancouver, May 4-18, 1994), p. 45.

18. R.V.G. Clarke, "Situational Crime Prevention: Theory and Practice," British Journal of Criminology 20 (April 1980), p. 137.
19. Ibid., p. 139.
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23. Alan N. Mancini and Rejendra Jain, "Commuter Parking Lots - Vandalism and Deterrence," Transportation Quarterly 41 (October 1987).
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4.0 COMFORT

4.1 Introduction to Comfort on Transit

Walking to and waiting at a bus stop in the rain and cold does not encourage riders for public transportation.¹

Comfort is important to people. Improving comfort during the transit trip involves improving the quality of the pathways people take to and from transit, as well as, improving the quality of the transit facilities.

Walking to transit should be relatively easy and comfortable. Sidewalks and pathways that allow people to get to transit quickly without getting too wet, or walking through too many puddles are important to the overall transit trip.

Pedestrians and wheelchairs must have safe all-weather surfaces to use. People cannot be encouraged to take a bus if they have to traverse through mud, gravel, or dirt to reach a bus stop at either end of a transit trip.²

Transit users should be able to stay warm and dry and have a place to sit. In the wet Vancouver climate it is important to provide shelter from the rain. Benches, lighting, washrooms, and garbage cans are some other elements that make a transit facility comfortable.

The studies in the following section demonstrate the importance of comfort to transit users. This chapter will then review the supply of comfortable seating and shelters at BC Transit facilities.

4.2 The Public View of Comfort

Though BC Transit has not surveyed the comfort needs of local riders, or the concerns about comfort that non riders have, the survey of University of British Columbia students demonstrated that there are concerns about the level of comfort associated with transit facilities. The students want more shelters, more benches, better lighting, washrooms, and garbage cans at the transit facilities they use. Of the students surveyed, 58% said that the existing transit facilities did not provide adequate shelter, and 65% said they want better shelter from the wind, rain and in one case, sun. In addition, 23% said they want places to sit, and 23% said they want better lighting. One survey participant wrote:

Bus stops are particularly bad, but many bus loops are also inadequately lit - it would be nice to have enough light so that one could read while waiting for buses at night (when service is also more infrequent, longer waits). Perhaps, locating bus stops near street lamps could minimize the expense of improving lighting.

Survey respondents were generally dissatisfied with the provision of seating at BC Transit facilities (see Table 4.1).

Table 4.1 Level of Dissatisfaction with Seating at BC Transit Facilities				
Seating	SeaBus	SkyTrain	Bus Loops	Bus Stops
	7%	39%	32%	49%
Source: 1993 Survey of University of British Columbia Students conducted by the author. See Appendix One.				

The UBC survey findings are similar to the results obtained by studies of other North American transit systems and their riders. The following three studies demonstrate the importance of comfort at transit facilities.

Thomas Austin and Eve Buzawa's Detroit transit study on transit safety, (discussed in Chapter Three) showed that transit users were concerned with comfort³. 8.4% of the survey respondents considered comfort to be the most important factor influencing their use of transit, and 14.3% found comfort to be the second most important factor to influence their use of transit.⁴

A study of bus stops and the requirement for shade to provide comfort to transit customers was done in Tucson, Arizona. Though Vancouver does not have the same problem with sunshine, transit customers' need for comfort is universal.

Accessibility, comfort and adherence to schedules are key factors influencing bus ridership. Because of Tucson's hot arid climate, shade at bus stops contributes to user comfort. Passenger requests chiefly focus on the dual needs for shade and seating; however, seating without shade is considered to be inadequate...Shade at bus stops improves the comfort of current riders and encourages new riders.⁵

A detailed survey of the Tacoma transit system was conducted by Ilium Associates.⁶

Twenty different aspects of the transit system were surveyed, including: transit fares, safety while on the bus, courtesy of bus drivers, routing, frequency of bus service, connections between buses, waiting comfort and availability of bus shelters. The study asked the six hundred participants to rate each of the components. The results were divided between riders and non riders.

Survey respondents indicated that they were not satisfied with the level of comfort. The transit system's successful provision of comfortable facilities was rated sixteenth, and availability of bus shelters nineteenth out of twenty components listed, with number one being the best. Next the participants were asked to pick three components that needed improvement the most. Waiting comfort and availability of shelters were the two components rated by transit users as most in need of improvements. (See Table 4.2.)

<p style="text-align: center;">Table 4.2 Top Ten Desired Improvements Mentioned by Transit Riders</p>			
Transit Components	Choices		
	1st (%)	2nd (%)	3rd (%)
Waiting Comfort	26.5	7.1	10.2
Availability of Shelters	21.6	28.6	3.4
Hours of Service	8.8	12.2	10.2
Availability of Cross Town Routes	8.8	4.1	9.1
Courtesy and Helpfulness of bus drivers	7.8	2.0	2.3
Waiting Safety	4.9	7.1	11.4
Routing	3.9	3.1	5.7
Frequency of Service	2.9	7.1	2.3
Behaviour of other Passengers	2.9	4.1	9.1
Comfort and Cleanliness of the Buses.	2.9	2.0	2.3
<p>Source: Excerpt from Table 8 in: Ilium Associates, <u>Tacoma Transit System Community Research Program</u> (Tacoma, Washington, 1979), p.13.</p>			

The survey continued by asking survey respondents if making the improvements they mentioned would encourage them to ride transit more often. More than 60% indicated they would increase their use of transit if the system was improved. Non transit riders responded similarly to the questions, picking availability of shelters and waiting comfort among the top four components of the transit system most in need of improvement. When asked whether these improvements would affect their likelihood of riding transit, 33% indicated that they would be likely to use the bus if the improvements were made.

No studies have been done to determine whether or not improving the comfort at transit facilities does increase ridership. The Ilium survey attempted to quantify the relationship between comfort and ridership by asking participants if they thought they would ride transit more often if the changes they requested were made. However, people do not always do what they say.

Each of these three studies of North American transit systems (in Detroit, Tucson and Tacoma) illustrates that people want a basic level of comfort when they used the transit system. The three studies also suggest that improving transit facilities encourages people to use transit more, though the Tacoma study was the only one that tried to quantify the degree to which transit ridership might increase.

4.3 Comfort at BC Transit Facilities

The BC Transit system facilities include 7600 bus stops, 40 bus loops (exchanges), two SeaBus terminals, and 20 SkyTrain stations. Based on the surveys, comfort at these facilities is largely dependent on the provision of shelter, seating, and lighting.

The SeaBus terminals provide the highest level of comfort on the local system, with plenty of shelter and seating, good lighting, public washrooms and information on departure times. In addition, transit riders using these terminals enjoy the cafes, newspaper shops, and the market found nearby.

The SkyTrain stations are designed to provide shelter and seating required for the short waiting periods of two to five minutes between trains.⁷ All SkyTrain stations provide shelter from the rain. SkyTrain stations provide sixteen seats (eight per platform). Eight seats fill quickly, and there is often a shortage of seats at the stations. The majority of the stations are above ground, and make use of natural light. At night, and in those stations that are enclosed or underground, the level of light is low, and the stations appear dark and dingy. Garbage cans are provided at all stations, but there are no public washrooms.

The three new Surrey SkyTrain stations are joint ventures with the private sector. That arrangement reduced costs and increased amenities. Comfort at these new stations is better, there is improved lighting, more visible elevators, and nearby cafes and shops. But there are still only eight seats per platform and no public washrooms. The bus system offers the least comfort to transit users. BC Transit limits its responsibility for bus stops to determining bus stop locations, and providing a bus stop sign. Any further improvements (benches, lights, sidewalks) are considered the responsibility of the municipality in which the bus stop is located.

A small number of bus stops, less than 1%, are located on land owned by BC Transit. BC Transit has provided bus shelters at these sites. (See Figure 4.1.)



Figure 4.1

Vancouver, Kootenay Loop

A miserable location that has been slightly improved by the provision of new bus shelters by BC Transit.



Figure 4.2

University of British Columbia's Bus Loop

The shelters are provided by UBC and BC Transit. Though the flyers look tacky, they are a source of entertainment for the students who wait at these bus stops.

There are also a limited number of cases in which BC Transit has established a joint venture with a second party to provide bus shelters and seating. The University of British Columbia (UBC) bus loop, and bus stops are an example where BC Transit formed a partnership with UBC to provide shelters on the University Endowment Lands. (See Figure 4.2.)

A few private enterprises have provided shelters outside their own establishments. Imperial Oil has done this at Kingsway and Willingdon in Burnaby.



Figure 4.3

Vancouver, Bus Stop at Broadway and Hemlock

This bus stop has a wide sidewalk, a new shelter, a garbage can and extra seating. In addition there is a pay phone and convenience store nearby.

The remaining bus stops, approximately 99% of them, are on municipal rights of way, and are considered to be the responsibility of the local governments.

Shelters are provided at bus stops in most of the municipalities by advertising companies (Seaboard Advertising and Key One Advertising). The City of Surrey is a typical example of the action that municipalities take when equipping bus stops. Surrey staff work with the advertising companies to review locations for bus shelters. The advertising companies are interested in placing shelters in high traffic, commercial areas, in order to maximize their advertising revenues. Through this program approximately 10% of the bus stops in Surrey

are provided with shelters.

Seating is also provided by the advertising companies, but because of the relatively low cost of benches, they are more widely available than shelters. In Surrey, approximately 70% of the bus stops have benches.



Figure 4.4

Burnaby

A municipal bus shelter in a residential neighbourhood.

Vancouver, Burnaby and West Vancouver have municipal bus shelter programs. In Vancouver and Burnaby these programs provide bus shelters in areas where it is not commercially viable for the advertising companies to place shelters. This results in advertising company shelters located in commercial areas, and municipal shelters in

residential, and low profile commercial areas. In the past, the Vancouver program also worked with neighbourhood improvement projects to provide bus shelters. (See Figure 4.5.)

Bus stop lighting is provided by regular street lights, which are considered by municipal staff to be sufficient to serve the requirements of transit. Garbage cans are the responsibility of the various city works yards, and are usually placed at bus stops only after a garbage problem is reported.



Figures 4.5 and 4.6

Vancouver, Commercial Drive

Two bus stops within a few blocks of each other. At one, the advertising shelter blocks the sidewalk and adds to the poor appearance of the street. At the second, shelter is provided by the adjacent building, the bench is municipal, and the sidewalk is in good repair.

The comfort of bus stops is affected by the quality of the sidewalk. Most municipal sidewalks are not wide enough to accommodate a bus stop and a bus shelter. Road works projects sometimes cause the sidewalks at existing bus stops to be widened, but none of municipalities has a program in place for increasing the width and quality of sidewalks at

bus stops. (See Figure 4.6.) Comfort at bus stops is also affected by the quality of adjacent buildings and the provision of awnings over the sidewalk that provide shelter from the rain. (See Figure 4.7.)

Shelter is provided at SkyTrain Stations, the SeaBus terminals and at a minority of bus stops. Seating is provided at the majority of stations and bus stops, but most stops are unsheltered so the benches are unused on rainy days. Lighting is provided at all facilities, though bus stops are only served by street lights, which are rarely bright enough to read by, and often too dim to provide security.

4.4 Analysis of Findings

Comfort at transit facilities should be addressed if ridership levels are to be improved. The surveys and studies reviewed in this chapter illustrate that transit customers consider comfort an essential component of the transit trip.

BC Transit is not concerned with comfort at transit facilities, and does not even consider bus stops to be its responsibility. The result is the level of comfort at transit facilities is low. Bus stops are the most common transit facility and the majority of bus stops are unsheltered.

The responsibility for bus stops has been delegated to the municipalities. However, few people are aware of the municipal role in providing transit stops and address their complaints to BC Transit. The municipalities deal with a broad spectrum of competing interests, and transit is given a low priority.

Municipalities rely heavily on the local advertising companies to provide benches and shelters at local bus stops. Advertising companies are not in the transportation business, and place shelters and benches only where they can collect advertising revenue.

Advertising bus shelters are located on busy commercial streets, to the benefit of the large number of transit riders who use a commercial area. However, the frequency of service is usually highest in these areas, and so each person using the bus stops in commercial areas is less likely to need shelter, or seating for long periods of time. Quiet residential or suburban areas where bus frequency is lower, and waiting periods are longer are also the areas least likely to be provided with the advertising company shelters. Burnaby and Vancouver provide municipal bus shelters to complement the shelters provided by the advertising companies.

Maintenance of the bus shelters and benches is an important part of any bus shelter program. Transit stops require regular maintenance in order to redress the damage done by use and vandalism. Keeping shelters in good condition will enhance their appearance and increase the level of comfort provided to the transit rider.

The three new SkyTrain stations in Surrey were joint ventures between BC Transit, the City of Surrey and private enterprise. Together, more cost effective and better equipped stations were designed and constructed. These stations illustrate the potential for improving transit stops and stations with help from the private sector.

4.5 Conclusions

Comfort is an important part of the transit trip. The surveys showed that people want more comfortable surroundings during the trip and that improvements in comfort may increase ridership.

Comfort can be improved by improving the quality of streets and sidewalks leading to transit stops. Sidewalks must be provided and should be wide enough to accommodate a bus shelter and still allow comfortable pedestrian circulation. Streetlight should be low and built for sidewalk use. And adjacent buildings should be encouraged to provide lighting, and awnings.

Comfort can also be improved by addressing the quality of transit stops and ensuring that the transit customers needs are met. At SkyTrain and SeaBus Stations the passengers' are reasonably accommodated though additional seating, public washrooms and better lighting are required. The bus system is the least comfortable with the majority of bus

stops lacking shelter, adequate seating, sufficient lighting and garbage cans.

Improving the degree of comfort will require BC Transit, local municipalities, advertising companies, and private enterprise to work together to establish better bus stops. BC Transit is the organization that is most strongly motivated to increase ridership levels. BC Transit must take the initiative and work with the municipalities to obtain better customer comfort. Municipalities should establish standards and guidelines for acceptable minimum levels of comfort at local and major bus stops. Municipalities must be willing to provide shelter and seating in the less commercial areas.

Chapter Four Endnotes

1. Snohomish County Transportation Authority, A Guide to Land Use and Public Transportation for Snohomish County, Washington (Washington, 1989), p.5-5.
2. Ibid.
3. Thomas Austin and Eve Buzawa, "Citizen Perception on Mass Transit Crime and its Deterrence: A Case Study," Transportation Quarterly 38 (January 1984), p. 112.
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5.0 INFORMATION

5.1 Introduction

A passenger information program that gives a clear understanding of available transit services, including connections, frequency of service, and costs, will encourage the use of transit.¹

This chapter deals with the importance of providing information on the transit system to current and potential transit users. If the frustrations of a transit trip are reduced due to the provision of all the necessary transit information, the trip will be easier and more satisfying. A positive transit experience will encourage users to experiment with transit again and to try transit for different destinations in the future.

The objectives of transit information can be divided into the information which is provided to aid current transit users, and the information that attracts new and infrequent users to the transit system.

Over 75% of the weekday transit trips are made by regular transit users.² These current users of the transit system are already familiar with the basics of the system but often want back up information. For example, people want schedules that list departure times, system information for the region, information on service changes and improvements, and signs to give local directions.

Approximately half of the residents in the Vancouver region are infrequent users of transit.³ In 1993, over a million tourists used the Vancouver transit system.⁴ These new and infrequent users of transit have different information requirements; they need to know the basics about the transit system. The new user may have no knowledge of the size of the transit system, the cost of transit fares, what a bus stop looks like, how to transfer from one bus to another, or the hours of operation.

Providing effective information to the public encourages and maintains the level of transit use.

Transit trips are encouraged where there is knowledge and confidence about connections to a prospective destination, frequency of services, and trip costs. Conversely, the lack of this information discourages trips by public transit, particularly by non-peak-period passengers, area visitors, and other types of infrequent or new users.⁵

5.2 Satisfaction Levels with Local Transit Information

BC Transit's Usage and Attitude surveys have demonstrated over thirty percent of riders and non-riders feel that increased information on transit use would motivate them to use transit more (see Table 5.1).⁶

Table 5.1 Information as a Motivator to Use Transit				
	Riders		Non-Riders	
More Information on Use	Vancouver	Suburban	Vancouver	Suburban
	31%	39%	30%	42%
Source: BC Transit, <u>The Market: Our Customers and What They Expect from Us</u> (Vancouver: BC Transit, 1992), p.15-16.				

BC Transit has very little information available on the types of information the people want. BC Transit does have statistics to measure the effectiveness of specific information campaigns. These include some general statistics on people's awareness of the transit system maps and signage. The statistics show that "75% of passengers are aware of maps and signage at stations and major stops," and further that, "more than 50% of passengers make use of them."⁷

Awareness of the system map, known as the Transit Guide, was also surveyed. The survey showed that 75% of transit riders are "aware of the maps posted at stations, loops and stops," and that 43% are "aware of the Transit Guide itself."⁸

BC Transit does not have any statistics to show whether or not, "awareness" equals satisfaction. Nor does BC Transit elaborate on how the "usage" of signage was defined.

The survey of UBC students, suggests that transit riders are not satisfied with the information provided by BC Transit. This is particularly telling, since UBC students have easy access to more transit information than most transit users, with maps and schedules

located in the Student Union Building, and schedules posted at the UBC Bus loop in "info tubes."

Students were asked about their ability to find schedules, maps, and fare information at the transit facilities they use. Of those surveyed, 61% said that they can't find schedules, 49% said that can't find maps, and 46% said that they can't find fare information at the transit facilities.

The students also commented on other aspects of transit information. Several voiced concerns over the "transinfo" phone service,

- The info number (261-5100) should work even after 11:30pm. What if one needs to know times of departures or arrivals late at night?

And some students made suggestions for transit information:

- In Calgary, each bus stop has a phone # attached to it. You can call "tele-ride" to find out when your bus is coming to your particular stop. Each bus stop pole has the relevant phone # attached to it and any delays are recorded on a message. This service is very popular.
- Little credit card schedules that would fit in a wallet.
- Maps to show where you are. In Quebec two transit companies use maps of the immediate neighbourhood to give you your bearings.
- List the price of fares on the bus stop.

BC Transit statistics demonstrate that almost one third of the population thinks that improving the availability of transit information will motivate them to use transit more. BC Transit statistics also show that though there is a reasonable awareness of transit information availability, there is still a significant percentage of transit riders (25%) who are

unfamiliar with the basic transit information. BC Transit has not surveyed ridership satisfaction with the transit information, but the results of the survey I conducted suggest that transit riders are unsatisfied.

5.2 BC Transit's Marketing Plan

The provision of information to the general public is the responsibility of BC Transit's Marketing Department. The 1993/94 Marketing Plan includes thirteen different information programs for which \$1,472,375.00 was budgeted (see Table 5.2).⁹ These programs are aimed at maintaining current transit riders, and attracting potential transit riders:

<p style="text-align: center;">Table 5.2 Summary of BC Transit's 1993/94 Planned Expenditures on Information</p>		
Item	Cost (in dollars)	% of Budget
Signage	75,000	5%
Transit Guide (map)	73,000	5%
Schedules	422,434	30%
Tourism	160,000	11%
Translation	no fee listed	---
Miscellaneous Brochures	80,000	5%
Advertising Campaigns	646,941	44%
Grand Total	\$1,472,375	100%
Source: BC Transit, <u>BC Transit 1993/94 Marketing Plan</u> .		

Signage accounts for approximately 5% of the budget, or \$75,000. The objective of the signage program is to, "enhance system use and safety through the provision of accurate, readable, and usable information," and develop the corporate identity.¹⁰ This relatively small budget (less than \$10.00 per facility) is supposed to accomplish these objectives and provide suitable signage at all the bus stops (7,600 of them), the SkyTrain stations and the SeaBus terminals.

This small budget may explain the lack of a unifying corporate sign at transit facilities. The bus stops have two types of sign, that differ greatly in style. (See Figures 5.1 and 5.2.)

The local bus stops that serve one route only, have a vertical strip sign that simply says "BUS STOP."



Figure 5.1
The basic bus stop sign.



Figure 5.2

The second type of bus stop sign lists the bus routes and provides the phone number for general transit information.

Bus stops at intersections, or on streets with several bus routes on them, have square signs that display the route number, destination, and the transit information phone number. These second bus stop signs, do not say "BUS STOP," nor do they even say "BC Transit." The only feature common to both types of sign are the corporate colours, white, red and blue.

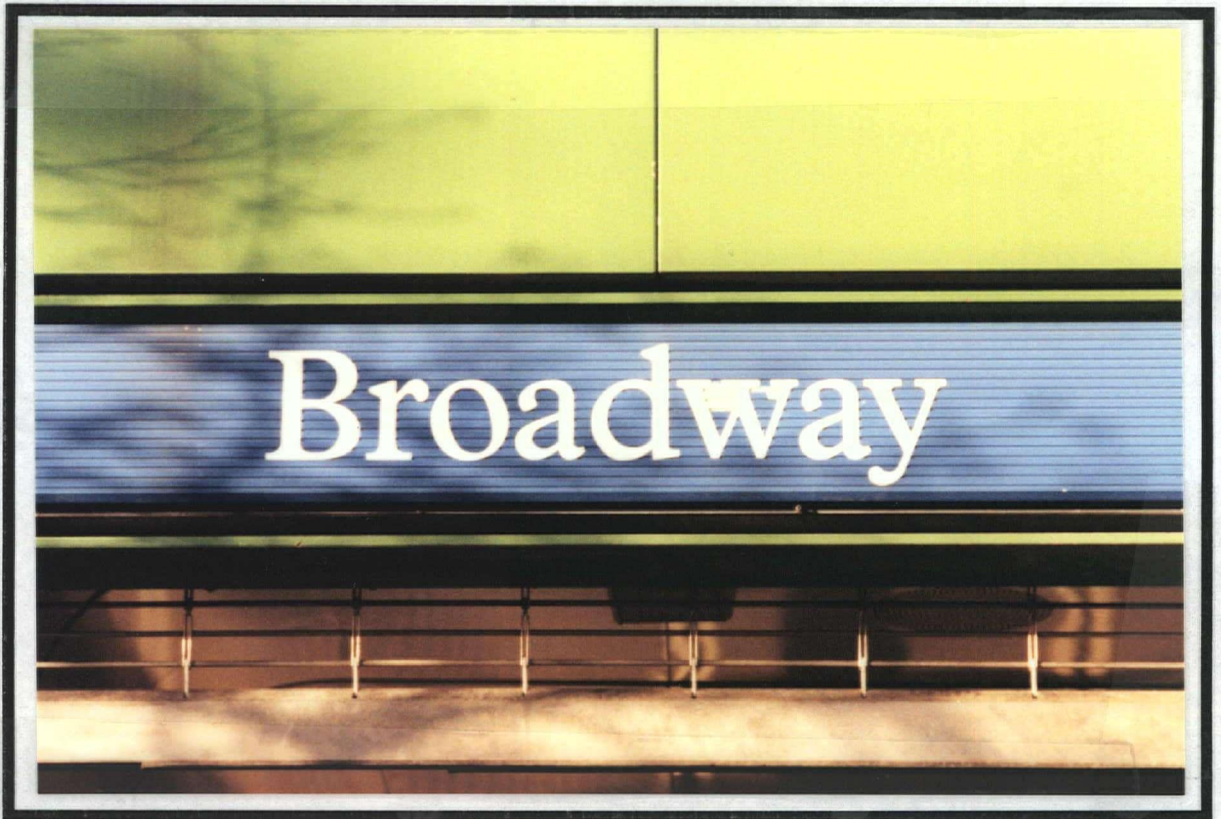


Figure 5.3
Broadway SkyTrain Sign.

SkyTrain Station signs are different again. Most stations have small blue letters above the entrances and at the platform level stating the name of the station. (See Figure 5.3.)

These signs are not large, do not use the corporate colours, or even state that they are transit stations. To add to the confusion, most stations are named after the street they are closest to.



Figure 5.4

Another common sign at BC Transit Facilities is this one telling you what can't be done.

The signage budget must also accommodate signs to inform transit users of the hours of operation, fares, "you are here" maps, and all other necessary information. Hours of operation are not noticeable at any transit facility, though they are listed on the back of the transit map.

Transit fares and tickets are easily determined for transit users starting the ride on SkyTrain or the SeaBus, as those transit facilities have well designed ticket machines. However, there are no signs explaining the transit fares at bus stops. Bus riders discover the fares once the bus arrives, as the sign explaining the fares and that exact change is required, is posted on the bus.

The transit system map, also known as the Transit Guide, accounts for approximately 5% of the budget spent on information. The objective of the system map is to provide a readable map that familiarizes transit users with the system.¹¹ The transit maps are available for sale at numerous locations throughout the region including corner stores, tourism bureaus, and book shops. A reduction of the map is also available in the front of the Yellow Pages.

Maps are found at all of the twenty SkyTrain stations and two SeaBus terminals. Most of the 7,600 bus stops do not have maps. The new bus shelters provided by the advertising companies are designed with the potential to install maps covered by a sheet of glass. However, BC Transit's budget to install and maintain these maps is not sufficient to meet the demand.¹²

Almost 30% of the budget for information projects, goes towards the printing of free route schedules. These schedules are available at public libraries, tourism offices, and municipal halls, and on some buses. They are not found posted at any transit stops or stations.

Excerpts from the schedules, outlining the departure times for specific bus stops, are posted in "info-tubes" at approximately 1% of all bus stops (including bus loops and transfer points). A new proposal to increase the number of info tubes to a total of five hundred (7 % of all facilities) is underway. The Marketing Department is currently attempting to prioritize potential info tube locations. BC Transit staff have stated that they

do not provide them at more locations because of the high cost associated with printing of individual schedules for specific bus stops. (No one at BC Transit was able to explain why inexpensive copies of the regular schedules are not available at transit stops and stations.)



Figure 5.5

Tourism Vancouver's BC Transit Display

A display that made greater use of symbols and images would probably be more successful given the large number of tourists who do not speak english.

BC Transit's tourism program accounts for 11% of the information budget. It is a two fold program that supplies a free book entitled "Discover Vancouver on Transit," and an information display at Tourism Vancouver (see Figure 5.5). The guidebook provides general information on the transit system and specific information on how to get to local

tourist attractions by transit. The guidebook is part of the BC Transit display at Tourism Vancouver, and is widely available at travel outlets, hotels and tourist attractions.

Language barriers are a problem for local residents as well as tourists to Vancouver. For example, BC Transit surveys show that 5% of the transit riders have Chinese as their first language, and that 37% of the Chinese population in Vancouver state that they do not have enough information on the transit system.¹³ BC Transit has begun to recognize this and has established a translation program to translate basic information and signs into Chinese and Punjabi.

In addition to the map ("Transit Guide") and the tourism guide ("Discover Vancouver") BC Transit produces a variety of brochures designed to help explain the transit system. The fact that there is a demand for these additional brochures should be a warning to BC Transit that their current signage is not sufficient. Among these additional brochures are: a SkyTrain passenger safety brochure; a system guide for seniors; a park'n'ride guide; and a bike'n'ride guide.

Most of the remaining information programs are advertising campaigns designed to increase awareness of the transit system and system changes. For example, the Special Event program entices people to use transit when attending the PNE or the Festival of Fire, and the Counter Attack program is designed to minimize drinking and driving at Christmas and Graduation.

The BC Transit marketing plan demonstrates that BC Transit is committed to providing information to the transit users and general public on the transit service. The information they provide is largely through media campaigns, and distributed materials. Very little emphasis is placed on providing information at transit facilities.

5.3 Recommended Information Requirements

Beimborn, Rabinowitz, Lindquist and Oppen, provide a guide to information requirements for transit facilities. They explain, that not all transit facilities require the same level of information. A local bus stop should, according to Beimborn and his associates, "be visible from one block away," and "provide bus route, fares, and schedule information."¹⁴ The level of information increases as stops and stations become more complex, and more heavily used. They state that the central business district transit station should provide the following information:

- Provide overall system routing, fares and local area information at a central location in the building.
- Provide individual route information -- a schedule and route map -- at individual bus queuing areas.
- Provide an active sign board identifying departure time of buses.
- Provide information services. This may be a dedicated telephone line or electronic information board in low volume centres or a manned booth in heavily used facilities.¹⁵

Using Beimborn's criteria, transit facilities in the Vancouver region can be divided into three tiers of service: local bus stops serving one route, major bus stops serving several

routes, and major transfer points, including SkyTrain stations, SeaBus terminals and the larger bus loops. Using the minimum requirements established by Beimborn, Table 5.3 illustrates what the minimum level of service information is for Vancouver's transit facilities. Table 5.4 indicates the degree to which the information is provided at BC Transit facilities. These two tables illustrate the distance between the current information provided at local transit facilities, and what experts in the transportation industry recommend be provided at transit facilities.

Table 5.3
The Minimum Level of Information Required at
Transit Facilities

Information	Local Bus Stop	Major Bus Stop	Transfer Point
Fare	✓	✓	✓
System Maps		✓	✓
Route Maps	✓	✓	✓
Schedules / Departure Times	✓	✓	✓
Information Phone line			✓
Transit Sign (bus stop)	✓	✓	✓
"You are Here" local maps		✓	✓

Source: Beimborn et al, Market Based Transit Facility Design, p. 57

Table 5.4
The Information Provided at BC Transit Facilities

Information	Bus Stop	Bus Loop	SkyTrain Station	SeaBus Terminal
Fares			✓	✓
System Map			✓	✓
Route Map			✓	
Schedules		✓		✓
Info-line				
Transit Sign	✓	✓	✓	✓
You Are Here Map			✓	✓

Source: Personal observations and discussions with BC Transit staff.

5.4 Conclusions

Providing information on the transit system encourages transit use. BC Transit statistics indicate that there are still a large number of transit users who are unfamiliar with transit information and many who might increase their level of ridership if they had access to more or better information. The results of the UBC student survey suggest that transit riders are not satisfied with the level and quality of available information.

BC Transit's marketing plan shows that they understand the importance of providing information, but that they have focused the information programs on media campaigns and distributed materials including maps, schedules and guidebooks. Very little information is available at the transit facilities, even though stops and stations are the most obvious places to look for and post transit information.

Transit industry experts have written about the minimum recommended levels of information that should be available at different types of transit facilities. When compared with the industry guidelines, BC Transit's stops and stations fall short, providing far less than the recommended minimum.

BC Transit has well designed schedules, maps and guidebooks but fails to use the information it creates to its best advantage by placing it at the locations where it could do the most good.

Chapter Five Endnotes

1. John J. Fruin, Passenger Information Systems for Transit Transfer Facilities (Washington, D.C.: Transportation Research Board, 1985), p. 2.
2. BC Transit, The Market: Our Customers and What They Expect from Transit (Vancouver: BC Transit, 1992), p. 4.
3. Ibid.
4. BC Transit, BC Transit 1993/94 Marketing Plan (Vancouver: BC Transit, 1993), p. 38.
5. Fruin, Passenger Information Systems for Transit Transfer Facilities, p. 3.
6. BC Transit, The Market: Our Customers and What They Expect from Us, p.15-16.
7. BC Transit, BC Transit 1993/94 Marketing Plan, p. 28.
8. Ibid., p. 26.
9. These figures are based on the costs associated with each project that provides information, and includes projects that are found in non "information" categories.
10. BC Transit, BC Transit 1993/94 Marketing Plan, p. 28.
11. Ibid., p. 26.
12. There is some debate between B.C. Transit staff as to whether it is their responsibility to install these maps at bus shelters or not. The Marketing Department says that it is, the Bus Stop planner, says that it isn't. Perhaps because of this confusion few bus shelters are installed with maps.
13. BC Transit, BC Transit 1993/94 Marketing Plan, p. 33.
14. Beimborn, Market Based Transit Facility Design, p. 205.
15. Ibid., p. 57.

6.0 ACCESSIBILITY

6.1 Introduction

Access to transit facilities and vehicles is an important issue for all transit users. A design that is easily accessible for people with physical handicaps is also a design that offers all transit users convenient and easy access to the transit system. Access is not just a problem for a small percentage of users who are physically handicapped. Access is a comfort problem for a large number of transit users. Many transit users who do not consider themselves disabled have mobility problems. Heart conditions, severe arthritis and sports injuries are just a few of the reasons that make walking long distances or using stairs difficult. Improving the accessibility of transit facilities can help these transit riders use transit.

Accessible options must be readily apparent if everyone is to benefit from them. In the survey of UBC students many students were not aware of the elevators at SkyTrain stations, even though a couple of students mentioned that sports injuries and baby strollers made stairs inconvenient and detracted from the transit trip.

This chapter looks at the demand for accessible transit service, and the method by which BC Transit has attempted to meet the demand.

6.2 Demand for Accessibility

In the 1980s, BC Transit developed the handyDART (dial-a-ride transit) program that provides door to door service for people who are unable to use regular transit due to physical or mental handicaps. In the 1993/94 fiscal year the handyDART program provided 795,000 transit trips.¹

During the 1980s, BC Transit met regularly with the Vancouver Regional Custom Transit Advisory Committee to discuss matters of interest to disabled transit passengers. Committee members represent organizations such as the BC Coalition of the Disabled, Canadian Paraplegic Association, Chown Adult Day Care Centre, Multiple Sclerosis Society and the Pearson Hospital. All members are handyDART users.²

In 1988, the Advisory Committee alerted BC Transit to the need for disabled passengers to have access to the entire transit system. In June, 1988, the Board of Directors for BC Transit, appointed three of its members - Mayor Gordon Campbell, Mrs. Jackie Drysdale, and Mr. Eric Clarke to a Custom Transit Task Force. The task force held public meetings in early 1989 at which overwhelming support was expressed for the need for transit to become accessible.

The Committee to Promote Accessible Conventional Transit (COMPACT), an advocacy group, presented its main arguments to the Task Force Hearings:

1. Disabled transit customers should be able to fully participate in all community activities served by transit.

2. Disabled persons should be able to travel when and where they wish without have to pre-plan and book trips several days in advance.
3. The provision of regularly accessible transit service is required under the Canadian Charter of Rights and Freedoms, and that continuation of handyDART alone is discriminatory.³

In order to better understand the transit needs of the disabled transit users, BC Transit commissioned a survey of 516 handyDART users. The survey results indicated that 8% of handyDART users would prefer to travel on the regular transit system, and that 35% of handyDART users would use regular transit if it was accessible.⁴

Using the results of the survey of handyDART users, and the results of a more recent study of 4,000 hours of bus trips, BC Transit anticipates 10% of handyDART users will ride the regular system while it is partially accessible, and up to 20% of handyDART users will use the system once it is fully accessible.⁵

No studies were conducted on the large number of transit users who do not consider themselves disabled or are not handyDART users, but have mobility and access problems.

6.3 Service Improvements

BC Transit's policy will be to provide a framework for Transit Commissions and municipalities enabling them to offer integrated multi-modal transit systems for disabled persons.⁶

In 1989, BC Transit adopted a policy promoting accessibility on all transit systems. This meant that instead of providing two separate systems, handyDART for disabled people,

and regular transit for everyone else, BC Transit would work towards an integrated system, where disabled people would be able to use all of the transit modes, transferring when necessary from regular transit to handyDART.

BC Transit has chosen to address the accessibility problem by adding accessible vehicles to the existing routes. Where possible changes to the built form have been carried out to improve the accessibility of transit facilities. However, the thrust of the work has been on purchasing accessible buses, and not on adopting a new principle of inclusiveness and comfort in the design of transit facilities.

Vancouver's integrated system includes: the handyDART system that has been in operation since 1980; the SkyTrain, a largely accessible system that has been in operation since 1986; the SeaBus, a fully accessible system that has been in operation since 1977; a steadily increasingly accessible bus fleet, and a taxi saver program (enabling handyDART users to get 50% off the cost of taxi service in the Lower Mainland).

BC Transit is moving towards accessibility. The first accessible buses went into service in 1990. All new vehicles purchased are accessible. By 2006 the entire bus fleet will be replaced with accessible buses. No retro-fitting of existing buses is planned.

Bus service is only accessible an accessible, lift equipped bus stops at bus stops that are built to the necessary specifications. Accessible bus stops require a specific curb height, and a wide paved sidewalk to accommodate the lift.

In other cities transit systems have been made accessible by providing lifts and ramps at bus stops. Curitiba, Brazil has bus stop platforms with lifts along its express bus lines.⁷ BC Transit did not consider this option due to the large number of bus stops in the transit system (7600), the expense of designing and constructing lifts at all of the bus stops, and frequency with which bus stops change locations.⁸

In these early years of the accessible bus program, accessible bus service is limited. BC Transit is providing service based on a combination of service demand and equal access across the entire transit system. Currently, 71 bus routes (44% of bus routes) provide "accessible service."

A route is defined as being "accessible" if there is an accessible bus running on the route on a regular basis (25% of the time) and if a minimum of 25% of the bus stops are accessible. The degree of accessibility varies greatly. Route 1, Beach-Gastown, provides close to 100% accessibility with an accessible bus on the route at all times, and 94% of the bus stops are accessible. In contrast Route 316, Scottsdale Mall, has an accessible bus on the route 44% of the time during weekdays, and 25% of the bus stops are accessible.⁹

Table 6.1 provides a comparison of the degree of accessibility found on bus routes in the region.¹⁰

<p style="text-align: center;">Table 6.1 Percentage of Accessible Bus Stops</p>		
Service Sub Area	Number of Accessible Bus Routes	Percentage of Accessible Bus Stops
Vancouver	17	46.5
Burnaby	8	43.6
New Westminster, Coquitlam, Port Coquitlam and Port Moody	9	46.2
City and District of North Vancouver	13	45.5
Surrey, Langley and Delta (north)	10	38.2
Richmond	7	50.6
Township of Langley	1	25.7
Delta (south)	2	29.9
Pitt Meadows and Maple Ridge	4	33.6
Total	71 bus routes 44% of all routes	43.6% of bus stops on the accessible routes
<p>Source: Bruce Chown, BC Transit, "Wheelchair Accessible Bus Routes," an unpublished BC Transit document.</p>		

6.4 Analysis of Service

The BC Transit accessible transit program is designed to address the concerns raised by disabled persons and their lobby groups. However, the time frame required to implement this program is 17 years, based on the lifetime of the buses in service.¹¹

The City of Vancouver is home to 45% of the disabled people who reside in the Lower Mainland. The trolley bus fleet that serves Vancouver is made up of the newest buses in the system. Based on the implementation plan, the trolley buses are due to be replaced with accessible buses between 2000 and 2006.¹² Therefore, the community which is home to the largest number of disabled people will be the last to achieve accessible bus service.

The level of accessibility on bus routes is largely dependent on the municipalities which provide the bus stops, the sidewalks and the street furniture at the bus stops.

Bus stops require sidewalks that are wide enough to allow a wheelchair to manoeuvre onto a bus lift (approximately 8 1/2 feet). The loading area must be free of newspaper boxes, benches, and garbage cans, which can block a disabled person's access onto a bus. The sidewalk must have curb cuts to enable arrivals and departures from the bus stop area.

Municipalities are responsible for the level of comfort at bus stops, as discussed in Chapter Four. The survey of handyDART users noted that 61% did not have a bus shelter at the nearest bus stop.¹³ Shelters are important for disabled customers who are often required to wait longer periods at bus stops until an accessible bus arrives.

Municipalities are also responsible for the condition of the sidewalks and streets in the areas surrounding bus routes. 35% of the handyDART users surveyed said that there were no curb cuts on the sidewalks leading to the nearest bus stop.¹⁴

If a definition of reasonable access is based on availability of sidewalks between the home of the registrant and the nearest bus stop, and the condition of the curb cuts available for registrants who use wheelchairs, one third of registrants do not meet these accessibility requirements.¹⁵

BC Transit has recognized this problem and is working with disabled transit users and municipalities to make sidewalk improvements a priority at bus stops that could serve disabled transit riders.

SkyTrain is considered an accessible transit service. Almost all of the stations provide elevators to the platform areas.

Unfortunately, many of the elevators are hidden from view, tucked behind the main entrance and out of site. The Burrard Street station elevator is hidden in what looks like a broom closet! (See Figure 6.1.) If the accessible pathways are not readily noticeable many transit users will not look for

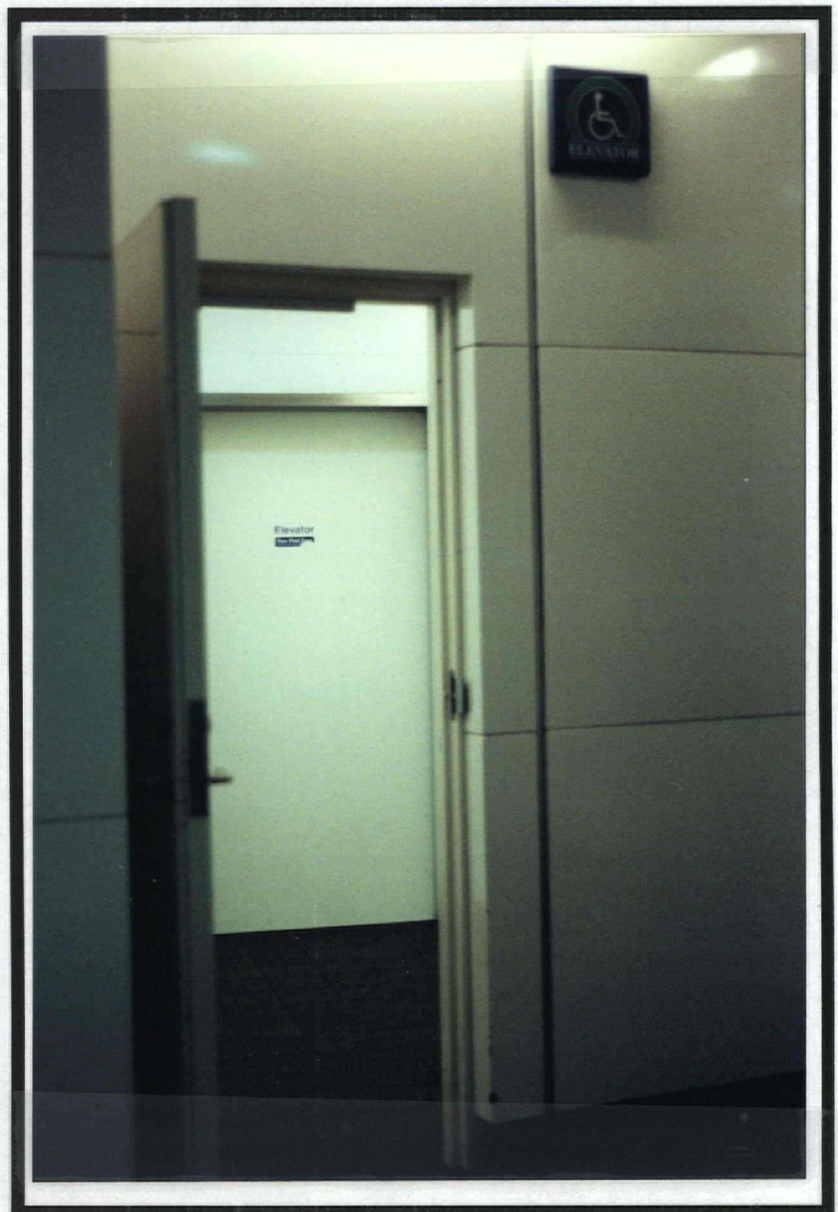


Figure 6.1
Burrard SkyTrain Station Elevator

them and will instead consider the system uncomfortable or inaccessible.

BC Transit meets with the Committee to Promote Accessible Conventional Transit (COMPACT) every two months to discuss accessible transit. Through these discussions several improvements to the system were developed. Individual's concerns are discussed, and solutions found. For example, one wheelchair user had problems with the elevator at Waterfront Station because he could not use the elevator buttons, the elevator was redesigned with larger buttons that this transit user can manipulate more easily.

Similarly, the Canadian National Institute for the Blind (CNIB) have been working with BC Transit to improve the tactile clues provided at SkyTrain stations. In particular, the yellow strip that runs along platforms, warning transit riders of their proximity to the edge of the platform is not sufficiently noticeable. BC Transit is planning to test a more knobbly material at Joyce SkyTrain station. Joyce Station was chosen for the renovation pilot project because the CNIB headquarters are relocated in the Joyce Station area.

6.5 Conclusions

In order to improve the accessibility of the transit system improved sidewalks leading to and from transit stops, and accessibly designed transit facilities are required in addition to the provision of accessible transit vehicles.

A fully accessible transit system that is designed to accommodate easy barrier free access will benefit many transit riders. Entrances to stations must be designed to demonstrate the options that are available. People should be able to choose the most comfortable and convenient path to the platform.

BC Transit is working towards complete accessibility within the transit system. The time frame for converting the bus system is lengthy, but is in keeping with other transit system accessibility programs. Seattle's bus system has taken approximately 15 years to become 75% accessible.¹⁶

The time frame for converting the bus fleet is most serious in Vancouver where 45% of disabled people live but which will be the last area to receive accessible buses.

Converting the bus system requires both a fleet of new accessible buses and a network of accessible sidewalks and bus stops. Currently, the purchase of buses is outpacing the renovation and construction of accessible bus stops.

Despite these drawbacks converting the entire system over to accessibility will improve the overall comfort and convenience of transit travel. People recovering from sports injuries, car accidents, people with heart problems or arthritis will all benefit from accessible design at transit facilities.

The cost of making the changes to the transit system is not unreasonable when one

considers the current cost to the tax payer of the existing handicapped travel programs. Cost comparisons were done for the different methods of providing accessible transit trips: handyDART, the taxi saver program, and lift equipped buses. The lift equipped buses are the most economical method of transportation. (See Table 6.2.)

Table 6.2 Accessible Transit Alternatives Comparison of Costs (1992/93)			
Service Type	Total Trip Cost	User Fare	Taxpayer Contribution
handyDART	\$17.00	\$1.35	\$15.65
Accessible Bus	\$3.25	\$0.75	\$2.20
Taxi Saver	\$7.70	\$3.85	\$3.85
Source: Bruce Chown, BC Transit, "Fully Accessible Transit Service in the Vancouver Region," an unpublished BC Transit document, p.9.			

BC Transit has continued to work with user groups to get feedback on its accessibility programs. The comments are largely positive but there are major concerns over bus stops and sidewalks.

Municipalities must build and renovate bus stops and sidewalks so that they can accommodate wheelchair use, and facilitate accessible transit. Municipalities must acknowledge their role in providing accessible transit and place a higher priority on bus stop and sidewalk renovation.

Chapter 6.0 Endnotes

1. BC Transit, 1992-1994 Annual Report (Surrey: BC Transit, 1994) p. 15.
2. BC Transit, Proposed Implementation Strategy for Lift-Equipped Buses in the Vancouver Region and Interim Improvement Options (Vancouver: BC Transit, 1989), p. 13.
3. Bruce Chown, BC Transit, "Fully Accessible Transit Service in the Vancouver Region," a BC Transit in house document (Vancouver: BC Transit, 1993), p. 4.
4. BC Transit, Proposed Implementation Strategy for Lift-Equipped Buses in the Vancouver Region and Interim Improvement Options, Appendix D.
5. Bruce Chown, BC Transit, personal interview, February 10, 1995.
6. Bruce Chown, BC Transit, "Fully Accessible Transit Service in the Vancouver Region," p. 5.
7. Cezary Bednarski, "Homo Itinerans," Architectural Design 64 (May/June 1994), p. 23-25.
8. BC Transit and municipalities often find it necessary to relocate bus stops in order to accommodate new development, address complaints and meet transit objectives.
9. BC Transit, Bus TimeTables, Routes 1, and 316 (Surrey, 1994) and Bruce Chown, BC Transit, "Wheelchair Accessible Bus Routes," unpublished (Surrey: BC Transit, 1994).
10. Accessible bus service is noted in the timetables and accessible bus stops are marked with handicapped symbol.
11. BC Transit, Proposed Implementation Strategy for Lift-Equipped Buses in the Vancouver Region and Interim Improvement Options, p. 5.
12. Ibid.
13. Ibid., Appendix D.
14. Ibid.
15. Ibid.
16. Brad Fisher, City of Surrey, personal interview, January 31, 1995.

7.0 WAITING

On public transit systems, we are not only bereft of an automobile's distractions and amenities, but we are also more vulnerable to the ordeal of long, unpredictable waits that set off waves of helpless anger.¹

Chapter Seven discusses the perception of time while people wait for transit vehicles to arrive.

BC Transit's Usage and Attitude survey asked people what their reasons were for not using transit more often. Many people mentioned car ownership, or the lack of convenience associated with public transit. Of all of the possible reasons people do not use transit, six percent stated that they do not like the wait.²

The ideal method of improving the transit wait is to increase the frequency of service. However, many routes in the Lower Mainland have insufficient ridership levels to merit costly increases in frequency of service. Low density suburban areas may never have the ridership required for frequent transit service.

Currently, bus frequency in Vancouver average less than 15 minutes, and in the Suburban areas average 30 - 60 minutes.³ Waiting times are directly related to transit frequency on busy routes where intervals between transit service are short. However, on bus routes that have infrequent service, regular customers are likely to check the timetable for the bus and arrive at the bus stop closer to the time the bus is expected. Improving the availability of

schedules will help decrease the waiting times, as transit customers will be able to schedule their transit trips more accurately. However, there will always be customers who have to wait because they arrive early, miss a connection, or do not have a schedule.

Real waiting times cannot always be improved, but perceived waiting times can be reduced if the quality of the wait is improved. The old adage, "time flies when you're having fun," is accurate.⁴ If the wait at a bus stop is more pleasant, it will be perceived to be shorter.

Psychologist Scott Brown writes:

Situations involving a heightened temporal awareness, such as boredom, impatience, and anticipation, often seem to produce an apparent lengthening of time. The classic example of this effect is the "watched-pot phenomenon" (Fraisie, 1963), where time seems to drag slowly by. In contrast, when one is engaged in some absorbing activity, temporal awareness becomes relatively minimized and perceived duration becomes shortened.⁵

In Part Two, people's concerns with transit have been discussed. Improving each of these concerns impacts on the quality of the waiting period and people's perception of time.

Decreasing people's level of fear, while they wait for transit helps transit customers feel at ease, and lessens the tension associated with the waiting period.

Providing customers with shelter, light, and seating allows customers to wait in comfort. It also enables transit customers to read a book while they wait, write a shopping list, or work on a report. These activities help pass time, and decrease the boredom of the wait.

Providing schedules at the stops and stations is invaluable to the waiting period. If people

can check a schedule and find out they have fifteen or twenty minutes before the next bus arrives, they can go to a nearby shop and buy a newspaper or a cup of coffee, or simply wait in the warmth and safety of a nearby building. The SeaBus terminals are great examples of this service. Transit users check the departure times of the SeaBus, and then go into the market (at the north terminal), or over to the coffee shop (at the south terminal) while they wait for the next SeaBus.

The ability to use up one's waiting time by running small errands, doing shopping, or eating, is only possible if there are shops and services nearby. If transit routes and major transit stops (loops, transfer points and stations) can be planned in conjunction with commercial enterprises, transit users will have the convenience of these services as they travel. These land use decisions will be discussed in Chapter Eight.

The quality of the wait can be improved if the surroundings are pleasant. Surroundings can be improved if there are pleasant views, interesting public art, entertainment, or a buffer between the waiting area and the passing traffic. These aspects of design can be reviewed as transit stops and stations are planned, and as the areas around them develop. Chapter Nine and Ten on urban design will offer a more detailed discussion of methods of designing higher quality waiting areas:

7.1 Conclusion

Waiting times for BC Transit riders can only be decreased if frequency increases. Frequency is unlikely to increase in many areas where ridership levels are low. In high ridership areas like Vancouver, frequency averages just under 15 minutes. Significant reductions of these waiting times are unlikely in the near future.

Improving the quality of the waiting time, reduces the transit riders' perceived length of time spent waiting, and improves the overall quality of the trip.

The wait is improved by addressing the concerns of the transit riders including, safety, comfort, availability of information, and access.

These concerns can be met, and the overall quality of transit facilities improved through the planning process. The planning process is the subject of Part Three, wherein the discussion will focus on land use, urban design, and on-site design.

Chapter 7.0 Endnotes

1. Winifred Gallagher, The Power of Place (New York: Poseidon Press, 1993), p. 150.
2. BC Transit, The Market: Our Customers and What They Expect from Transit (Vancouver, 1992), p. 13.
3. Ibid., p. 17.
4. Fraisse, 1963; Curton and Lordahl, 1974; McKay, 1977; Hicks, Miller, Gaes, and Bierman, 1977, and Cahoon and Edmonds, 1980 are all referenced in Scott Brown, "Time Perception and Attention: The Effects of Prospective versus Retrospective Paradigms and Task Demands on Perceived Duration," Perception and Psychology 38 (August 1985), p. 115.
5. Scott Brown, "Time Perception and Attention: The Effects of Prospective versus Retrospective Paradigms and Task Demands on Perceived Duration," Perception and Psychology 38 (August 1985), p. 115.

Conclusion to Part Two

The research discussed in Part Two demonstrates that people are unsatisfied with the quality of their transit trips and want the walk to the transit stop and the waiting period improved.

While walking to and from transit people are concerned for their personal safety and want pedestrian trips to be short and safe.

Comfort on the walk can be increased by the provision of paved sidewalks, street lighting, covered walkways and street trees. Paved sidewalks can protect pedestrians from passing traffic and muddy puddles. Street lighting should illuminate the walkways to add comfort and safety to the walk. Street trees can provide shade and add pleasure to the trip. And covered walkways or awnings along commercial streets can provide pedestrians with shelter from the rain.

Transit facilities should be clearly visible from one block away so that pedestrians can easily spot the closest transit stop and walk directly to it. Alternatively, signage can be posted at intersections along transit routes and close to transit stations pointing the way to the closest transit facility.

Easy access to transit is dependent on accessible pathways leading to transit stops. Curb cuts that allow wheelchair users to navigate their way to and from transit are essential to establishing an accessible transit system.

The waiting period and quality of the transit facilities is also in need of improvement to address the concerns raised in Part Two.

People are frightened while they wait at transit stops and want additional surveillance and brighter light. Three studies have been done on transit safety and all three recommend using Crime Prevention Through Environmental Design principles to improve the level of safety at transit facilities.

People want more information on the transit system, and surveys suggest that providing this information may increase ridership. New and infrequent transit users need basic information like fare prices and transit maps. Regular users need schedules and route maps. BC Transit produces a variety of information aids but not enough information is provided at transit facilities where people need it, and look for it.

The transit system is slowly becoming accessible as accessible transit vehicles are purchased. However, access is limited by the design of transit facilities. Improving access at transit facilities will increase the comfort and convenience to all riders, many of whom prefer to avoid stairs.

Finally, the experience of waiting and the perception of time was discussed. Boredom, fear, and uncomfortable surroundings make time drag. Improving transit facilities and adding things for people to do or look at while they wait can reduce the perception of waiting time, even when real waiting times do not change.

PART THREE

THE PLANNING PROCESS

Introduction to Part Three

Discussion in Part Three will focus on planning and urban design strategies that can improve the design and quality of the transit trip.

Designing for the transit user and the pedestrian instead of the automobile or transit vehicle should improve the way we design our city streets and transit facilities. People's needs should come first, and their concerns and comfort should be part of any design no matter how large or small.

This section of the thesis will review planning strategies to determine the ways that land use planning and urban design can be used to improve our streets and transit facilities.

8.0 LAND USE

8.1 Land Use and Transit Use

Land use has a direct impact on the viability of transit routes. The level of transit service available depends on the degree that people ride transit. Increasing the level of housing densities (dwelling units per acre), employment densities (jobs per acre), and services that attract transit users increases the total population on a transit route, and increases ridership, and in turn improves the transit service.

Transit routes are developed where there are customers to serve. Routes developed through low density residential areas or agricultural lands will have few riders and are unlikely to offer frequent service. Alternatively, high density mixed use areas urban areas are likely to have a high demand for transit and a correspondingly high level of service.

Land use decisions can support transit route development in four ways: establishing higher density housing, locating transit compatible land uses close to transit routes; increasing the mix of land uses; and developing high density focus points at transit centres.

Density

Pushkarev and Zupan studied the relationship between housing densities and transit service levels in the seventies.¹ Their results are the industry standard for the ratio

between housing densities and transit services. (See Table 8.1.)

Table 8.1 Transit Service Related to Density	
Service	Density (units/ hectare)
local bus, hourly service	10 uph
local bus, thirty minute service	17 uph
15 minute service, and express buses	22 uph
very frequent service - 5-10 minutes	37 uph
Source: Pushkarev and Zupan, <u>Public Transportation and Land Use Policy</u> .	

The Transportation Association of Canada (TAC) recognized the importance of the distribution of densities with regards to transit:

The densities of land uses and the distribution of those densities around transit routes fundamentally determine the level of service which becomes cost-effective. To facilitate high levels of service, low density uses should be discouraged and higher density uses encouraged in their place. Densities should be highest immediately adjacent to transit service, and lowest in more remote areas.²

Transit benefits from high density land uses adjacent to transit routes because of the corresponding increase in transit ridership. Municipalities benefit from the improved quality of transit service that is an amenity for the residents and businesses located within the municipality.

Transit Compatible Land Use

An analysis of different land uses and their compatibility with transit was done by Beimborn, Rabinowitz, Gugliotta, Mrotek and Yan.³ Their work rated 74 land uses from

one to five in terms of the likelihood of people to use transit to go to and from these types of land use. Their findings demonstrate that some types of land uses are more automobile oriented than others. For example, garden supply centres, lumberyards, industrial parks, and golf courses are all automobile oriented. Whereas hospitals, high schools, universities, office towers, and grocery stores are compatible with transit use.

Developing compatible land uses along transit routes supports existing transit service. Transit routes that serve areas that have transit compatible land use have higher ridership levels than routes in areas that have non-compatible land uses. Few people want to take transit to go to the lumber store; locating a lumber store on a transit route will not increase ridership. Conversely, using the same site for grocery, liquor and drug stores will increase ridership.

Beimborn and his associates suggest that transit is most successful when transit oriented and automobile oriented land uses are distinguished and separated. They recommend that automobile oriented land uses should be located on major arterials or highways. This allows transit routes to be developed with transit oriented land uses only.

An important element in making the concept [transit] feasible is to predesignate corridors for transit service and for the location of transit-oriented land uses. Early location and designation of the corridor is essential so that subsequent land use decisions can be made with a commitment to future transportation services. This will enable communities to separate auto-oriented land uses from transit-oriented land uses and to locate them in relation to the proper mode. Failure to do so will result in an inappropriate level of density, a separation of trip generators, and poor pedestrian access that would likely minimize the chances of successful transit services.⁴

Designation of transit corridors enables municipalities to plan for transit more effectively. Land uses that are automobile oriented can be located in alternative areas, fostering the development of transit and pedestrian zones along transit routes.

Diversity of Land Use

A mixture of land uses provides a variety of destinations for transit riders, and a variety of customers for transit. Mixing land uses also increases ridership throughout the day. Universities, shopping areas, and recreation centres provide off peak ridership, while employment centres, and residential areas provide rush hour ridership.

Segregation of land uses is not beneficial to transit use. Transit riders want the convenience of being able to run errands on their way to and from destination points.

Mixed use development can reduce the number of trips necessary by 25%.⁵ Creating mixed use areas along transit routes makes it easier for transit riders, saving them time and trips. The Transportation Association of Canada writes:

Mixing of higher-density land uses (residential, retail, and office) adjacent to transit nodes and corridors allows a single transit trip to serve multiple ends, and thus encourages ridership.⁶

Focused Development

Mixed use, high density areas can be focused at transit stops and stations. Mixed use areas vary in size and diversity. At the local scale, a corner store can be located next to a local bus stop in a residential neighbourhood. The store increases the convenience of

the transit trip and provides a level of security, comfort and respite from boredom. Transit customers gain the opportunity to buy a coffee and a newspaper while they wait for the bus in secure surroundings.

Major transit stops and stations are ideal locations for medium to large sized mixed use centres. Toronto's Eglington area is an example of a mixed use development at a transit stop. Eglington subway station is located on the Yonge Street subway line and has high density housing, restaurants, shops, cinemas, and office towers located within a few blocks. Transit riders using Eglington station have all the urban amenities they need at a central and convenient location. The diversity of use in the area increases the street life, and improves the overall level of safety as people visit restaurants, bars and the cinemas late into the evening.

Larger mixed use areas may be found at town centres. In Surrey, Newton Town Centre was developed with a central bus loop, and City Centre (previously known as Whalley) has Central SkyTrain station and connecting bus loop. Surrey's centres are still relatively new, built in the last six years, but they are both showing promising signs of developing into mixed use centres. Both centres have high density housing projects under development, as well as recreation facilities, libraries, retail and commercial projects constructed or proposed.

Burnaby's Metrotown SkyTrain station provides a more mature example, although it is only nine years old. Metrotown is known primarily for its huge shopping centre complex, but

there are also office towers, high-rise condominiums, a recreation centre, and a library within a few blocks of the SkyTrain station.

8.2 Transit Oriented Guidelines

Portland, Oregon uses zoning regulations to foster these ideas of transit friendly development (increased density, transit compatible land use, mixed use, and focused development). Beginning in 1972 with an Urban Growth Boundary that focused growth in the town centre⁷, and continuing more recently, with a transit overlay zone that encourages development at transit stations. Portland's transit overlay zone reads:

The Light Rail Transit Station overlay zone encourages a mixture of residential, commercial, and employment opportunities within identified light rail station areas. The Transit Zone allows for a more intense and efficient use of land at increased densities for the mutual reinforcement of public investment and private development. Uses and development are regulated to create more intense built-up environment, oriented to pedestrians, and ensuring a density and intensity that is transit supportive. The development standards of the zone are also designed to encourage a safe and pleasant pedestrian environment near transit stations by encouraging an intensive area of shops and activities, by encouraging amenities such as benches, kiosks, and outdoor cafes, and by limiting conflicts between vehicles and pedestrians.⁸

Portland's 15 mile (24 kilometre) light rail system opened in 1988 and has lead to \$(US)800 million in development, and the revitalization of the downtown area. During an interview Greg Baldwin, one of the architects for Portland's light rail system, credited the system's success to the zoning regulations that support local development:

[N]either installing the light rail lines, nor maintaining a pace setting standard of finishes and design, has done it alone. The anti-car classic tale enacted by Tri-Met,

Portland's transit agency, with other planners entailed a ban on roads and parking spaces, and zoning for higher density around transit stations.⁹

Similar transit oriented guidelines have been developed for San Diego¹⁰ and Sacramento by Peter Calthorpe, author of the Pedestrian Pocket. Peter Calthorpe is widely recognized as one of the foremost proponents of neotraditional town planning. Neotraditional planning is geared towards creating pedestrian friendly developments, where the majority of services and amenities are within easy walking distance. Unlike Andres Duany and Elizabeth Plater-Zyberk, other proponents of neotraditional planning, Calthorpe emphasizes the importance of incorporating transit. His plans include transit oriented development (TODs) where mixed use, high density areas are developed around transit stations.

Calthorpe Associates working with developer Phil Angelides designed Laguna West a 1,045 acre (423 hectares) suburban enclave in Sacramento County, California. Calthorpe's original design focused heavily on mass transit with a bus depot and a connection to a proposed light rail route.

In his [Angelides'] and Calthorpe's concept, a \$1.3 million town hall doubles as a commuter bus depot set on a village green. Shoppers borrow community bicycles for errands. Classrooms, playing fields and daycare placed nearby reduce auto trips. Even gestures may help. [Angelides states] "If we give out free juice, coffee and rolls to everyone who rides transit, it would probably cost us only \$4,000 a year. And its a nice symbol. People need to understand that riding transit is not a hostile experience. It's a positive thing."¹¹

Private development projects do not always get the public transit systems they plan for¹², five years later, Laguna West is largely developed, but the transit system that was the

original focus of the development has not materialized¹³. Speaking at a public forum,

Calthorpe states:

My earliest work in trying to define pedestrian pockets was directed at the light rail system but what I've found over the last six years is that the principles are equally meaningful without direct, mainline transit systems. Feeder buses or even car pools could be completely effective as long as the destination is a dense suburban centre with a cluster of uses.¹⁴

Planning communities that are transit oriented, does not mean that bus companies control land use decisions. It means that pedestrian friendly, transit compatible developments are focused in areas that are easily be served by transit. Transit overlay zones or alternative methods of transit planning can be adopted by local governments in order to foster transit use. Focusing diverse high density land uses encourages pedestrians and transit.

8.3 Municipal Land Use Decision Making

In 1990, the eighteen member municipalities of the Greater Vancouver Regional District supported the policies outlined in Creating Our Future: Steps to a More Livable Region, including:

Reverse transportation priorities so decisions are made to favour walking, cycling, public transit, goods movement and then the automobile.¹⁵

Some municipalities adopted similar policies, most notably Vancouver's Clouds of Change report that states:

The burning of fossil fuels in motor vehicles and the associated release of carbon dioxide is one of the prime contributors to atmospheric pollution and change. If we continue our present trends for the next few decades, we can expect to see not only

intolerable levels of atmospheric pollutants, but also increasing congestion, longer commuting times, increasing demands for shorter work hours to compensate for longer travelling hours, and higher prices due to reduced worker productivity.¹⁶

The Clouds of Change report recommends a shift towards increased pedestrian, bicycle and public transit, and away from the private automobile.

Despite the rhetoric municipal governments continue to support the automobile and overlook transportation alternatives. City of Vancouver staff, in conjunction with BC Transit, recently proposed the removal of forty parking spaces in a stretch of south Granville Street, where the parking lane was adding to transit vehicle congestion during the afternoon rush hour. It was estimated that the removal of these parking spaces during rush hour, would decrease transit commuters travel time by 10% and allow for the development of a new express bus to Richmond. However, when the proposal went before Council it was defeated. Council chose to listen to shop keepers who feared the removal of parking spaces, instead of supporting transit use.

In discussions with municipal planners in the Vancouver Region, most professionals give lip service to the importance of transit. Many planners will quote from municipal policies like Vancouver's Clouds of Change Report.

Despite this, there are few examples of including transit in land use discussions. Most municipal planners admit that transit is useful, but not considered relevant to land use decisions.

In the Surrey Planning Department weekly meetings are held to discuss land use applications (Rezoning and Official Community Plan Amendments) and land use plans (Local Area Plans). These meetings are the basis for most land use recommendations to Council.

During the past two years I have listened to and participated in over one thousand land use discussions. Of these discussions fewer than five percent made any reference to transit. Furthermore, there was not one single case in which transit was considered a major factor in a land use decision.

Although planning departments discuss land uses and make recommendations; elected representatives have the final say. In most instances City Council follows the Planning Department's recommendations. Occasionally, Council refers items back to the Planning Department for further review, or decides in opposition to staff's recommendations.

A review of Surrey's City Council's decisions over the past two years, indicates that there have been two occasions when Councillors have discussed transit during a land use decision. An application for a seniors housing project was denied due to its isolated location away from local amenities, and public transit. And an applicant proposing a church was required to address the distance of the site from transit. The applicant then proposed a private van-pool.

During the same period there were no discussions by Councillors of the impact of land use

decisions on the local transit system. Nor was there any discussion on methods of improving the local transit system. This is surprising given the Councillors' commitment to the GVRD's planning strategies to promote alternatives to automobile use, and given the Mayor's position on the Board of Directors for BC Transit.

Based on discussions with planners in the Vancouver region, Surrey's lack of consideration of transit is common practice. Most municipalities do not consider public transit when making land use decisions. Furthermore, when transit is discussed it is given low priority, and it is not considered important enough to influence a land use decision.

8.4 Conclusions

Land use decisions have a direct impact on transit use. Increasing density and diversity of land use along transit corridors and at transit exchanges and stations can increase the level of transit use.

Increasing transit ridership has a direct benefit on municipalities. The more people use transit, the less they drive. Decreasing the number of automobiles on the local roads decreases traffic congestion and pollution levels. Increasing transit ridership improves the efficiency of transit routes, and leads to improvements in service.

Despite these benefits, most municipalities make land use decisions without considering

the impact on the local transit system. As a result, few local transit routes operate at maximum capacity and service levels. The problem is particularly significant in the suburban municipalities where densities are low, and transit frequency averages between 30 and 60 minutes.

Lower Mainland communities are growing rapidly. This growth should be focused in ways that encourage pedestrian and transit use. To do so, municipalities can designate transit corridors on Official Community Plans and Local Area Land Use Plans, or they can adopt transit overlay zones that focus mixed use, high density development at transit centres.

Examples of transit friendly planning can be found in Portland, Oregon, and in some of the neotraditional town plans, particularly those by Peter Calthorpe.

Local examples of transit centres that are developing into mixed use areas are uncommon. Few bus loops or SkyTrain stations have been developed into mixed use centres. Metrotown provides one example of high density, mixed use development, but it is still automobile oriented and does little to encourage pedestrians.

Bus stops and bus exchanges have been totally overlooked. Small scale, local land use decisions play an important part in improving the overall transit trip. Corner stores, coffee shops and newspaper stands are examples of land uses that could be located at or near transit facilities adding to the overall safety, comfort, and convenience of the transit rider.

Municipalities are responsible for land use decisions. They must consider the implications of land use decisions on public transit. Municipalities can foster pedestrian and transit compatible development that decreases automobile use and increase the use of the transit system.

Chapter 8.0 Endnotes

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3. Edward Beimborn et al., Guidelines for Transit Sensitive Suburban Land Use Design (Washington, D.C.: Urban Mass Transportation Administration, 1991), p. 9-11 and Appendix A.
4. Ibid., p. 35.
5. Snohomish County Transportation Authority, A Guide to Land Use and Public Transportation for Snohomish County, Washington (Washington: U.S.Department of Transportation, 1989), p. 7-15.
6. Bowes, Gravel, and Noxon, Guide to Transit Considerations in the Subdivision Design and Approval Process, p. A-4.
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9. Jane Holtz Kay, "Streetcars of Desire," Architecture 82 (August 1993), p. 59.
10. Ibid., p. 57.
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12. The federal government has been reluctant to invest the large sums of money required for a rapid transit system to serve a limited market.
13. Peter Katz, The New Urbanism, p. 18-29.
14. J. William Thompson, "L.A. Forum," Landscape Architecture 80 (July 1990), p. 58.
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9.0 URBAN DESIGN

9.1 Introduction

Planners should consider the potential impact of a design on the larger community. This is particularly important with public projects like streets and transit facilities. Improving the quality of streets and public spaces encourages people to use them. The more people enjoy walking the more likely they are to walk to the local transit stop.

Streets have been designed primarily for the automobile despite the range of users and methods of transportation. Consideration should be given to the current standards for road construction in order to encourage alternatives to the private automobile.

Understanding the variety of potential users of a site allows for the development of secondary uses. Most transit facilities have the potential to accommodate additional uses that would add to the overall quality of the transit trip and benefit the community in which they are located.

9.2 Public Responsibility

Planners share with other citizens the responsibility to strive for the betterment of their community. Working with the public's interest in mind, planners can design public places to do more than the minimum. Streets, parks, walkways, plazas and transit facilities can all be designed to improve the quality of the community and to invite use.

Planning for the public good is discussed by Clare Cooper Marcus and Carolyn Francis:

[A] designer or design researcher must consider both the larger societal changes and the creation of better, more supportive environments for people's daily lives.¹

The responsibility to improve the communities in which we live should be applied to design projects so that they have a positive effect on the public places in our communities. This responsibility falls most heavily on local governments. Public projects should benefit the community.

The light rail system and its station areas avoid imposing a uniform "transit" image by assuming varied characteristics in particular neighbourhoods... If more citizens are to be attracted and served by transit, the system must be inviting, conceived with care, and accommodating, while also contributing the unexpected. Even its construction should be an attraction. It should be conceptually simple, functionally prudent, and at the same time catholic in concept. In the process it should provide a very special place in the city.²

Publicly owned land offers unlimited opportunities for municipal improvements to the public realm and the pedestrian environment. William Whyte has conducted extensive research on how people use public places and he states:

Cities should take a closer look at what they already have. Most of them are sitting on a huge reservoir of space yet untapped by imagination. They do not need to

spend millions creating space. In their inefficiently used rights-of-way, their vast acreage of parking lots, there is more than enough space for broad walkways and small parks and pedestrian places - and at premium locations, at ground level.³

Transit facilities are public places used by transit riders and non-transit riders. Each transit centre represents an opportunity for broader use and usefulness. Stations and exchanges can add life and character to communities. Woolwich Arsenal railway station in London provides an example of a good design improving the character of a run down neighbourhood. Architectural critic Anne Boyle writes:

Woolwich station, with its diaphanous ring of metal sunshade round the glass drum, is a beacon of civilisation. A sense of the public realm that might help to re-invoke a sense of place in a long forgotten community.⁴



Figure 9.1
Phibbs Exchange, North Vancouver

Sexsmith Park and Ride in Richmond or Phibbs Exchange in North Vancouver are examples of desolate and isolated BC Transit facilities. There is nothing to do while you wait at these places. The level of safety is low because they are isolated and under used. These spaces are ugly, and add nothing to the cities where they are located. Planners must take a broader approach to the planning of these spaces. (See Figure 9.1.)

Municipalities and transit companies must recognize the potential of the public spaces in their jurisdictions and work with them to provide more lively and usable streets and transit centres. Improving the designs of public spaces will encourage people to use them.

9.3 Public Streets and Transit Facilities

Public Streets

The transit trip includes a walk to a transit stop or station, movement through or around a transit facility, waiting at the transit facility, the transit ride, and ends with a walk to the destination point.

Access to public transit by pedestrians, bicyclists and automobile users should be convenient, safe, and direct. All transit trips begin as pedestrian trips and end as pedestrian trips. Pathways should be provided which minimize distances to points of activity, provide attractive waiting environments and incorporate other land uses and services that support pedestrians and bicyclists.⁵

Municipal and transit designers must consider the pedestrian environment that transit

riders use on their way to and from transit facilities. By and large, the pedestrian environment is made up of sidewalks, and pathways.

Streets are used by pedestrians, transit riders, transit vehicles, bicycles, trucks, and private automobiles. Despite this diversity of users, modern streets are built primarily for the private automobile. Pushkarev and Zupan write:

Planning for pedestrians in urban centres has been badly neglected. Nineteenth Century street layouts frequently allocated as much as half the urban right-of-way to walkways, which was ample when very few buildings were more than three stories high. But when buildings in downtown areas started to get taller - and to attract more pedestrian trips - no effort was made to set them back further from the building line. On the contrary, real estate pressures forced closer encroachment. When the motor vehicle arrived on the scene, roadways began to be widened, likewise at the expense of walkway space. Thus, in downtown areas, the pedestrian was squeezed into leftover space between the traffic and the building walls...Virtually the only attention paid to pedestrians was with respect to their physical safety, not to their comfort and amenity.⁶

In order to plan for pedestrians, cyclists and transit riders planners must change the way they plan for cars, in particular planners must change the way streets are built.

Attracting pedestrians back to the street is an art in itself. Streets need animation and detail; not surprising given the automobile orientation.⁷

In Surrey, the standard for the construction of roads and sidewalks is laid out in the Subdivision By-Law. The Subdivision By-law favours the automobile. It provides standards for local roads that are 16.5 metres wide but do not have a single sidewalk.

Municipalities must re-assess the standards for built form and infrastructure to reflect modern priorities. People are unlikely to stop using their cars if the alternatives are

unappealing.⁸

Sidewalk design should be carefully considered so that municipalities develop streets that are lively and interesting. Jane Jacobs comments are as relevant today as when they were first published thirty-four years ago:

Streets and their sidewalks, the main public places of a city, are its most vital organs. Think of a city and what comes to mind? Its streets. If a city's streets look interesting, the city looks interesting; if they look dull, the city looks dull.⁹

To encourage pedestrian use of sidewalks, sidewalks must be wide enough where necessary to accommodate bus stops, and heavy pedestrian traffic flows. The sidewalks should have lighting designed for pedestrians and people waiting at transit stops; not just for cars (which come equipped with their own lights). The sidewalks must have curb cuts and ramps to accommodate baby carriages, strollers, shopping baskets, wheelchairs and scooters. Street tree programs, garbage cans, public benches, shelters, and other street furniture should be carefully designed, in order to improve the quality of the street for all of the street's users.

Transit Facilities

Transit Facilities can be designed to encourage public use and add to the communities in which they are found. Transit stops can be used by a variety of people who are not transit riders for a number of different uses that add to the primary transit use.

In the Vancouver Regional Transit System very few facilities have been developed to

accommodate additional uses that provide amenity and convenience to the transit users or the surrounding community. The Burrard SkyTrain station provides an example of how this can be done. The station has two plaza areas and a main concourse that connects it to two office complexes. It is used by office workers and couriers who want to relax and eat lunch in a rear garden plaza, by people passing through from one office complex to another along the lower concourse, by people watching and waiting in the front plaza area facing Burrard Street, and finally by people descending to the SkyTrain platforms.

Planners should consider who the different users of public transit facilities are. Very little is written about who uses, or could use, transit facilities other than transit riders. Clare Cooper Marcus and Carolyn Francis explored the uses of urban plazas including transit foyers and bus stops. Their research shows that people use these spaces to watch, listen, eat, and relax.¹⁰ They also found that people want seating, entertainment, landscaping, and food to make the spaces more pleasant and encourage more use.¹¹ This list is very similar to the desires of local transit users discussed in the first few chapters of this thesis. Local transit riders were concerned with safety, comfort, and activities (things to eat, watch and read).

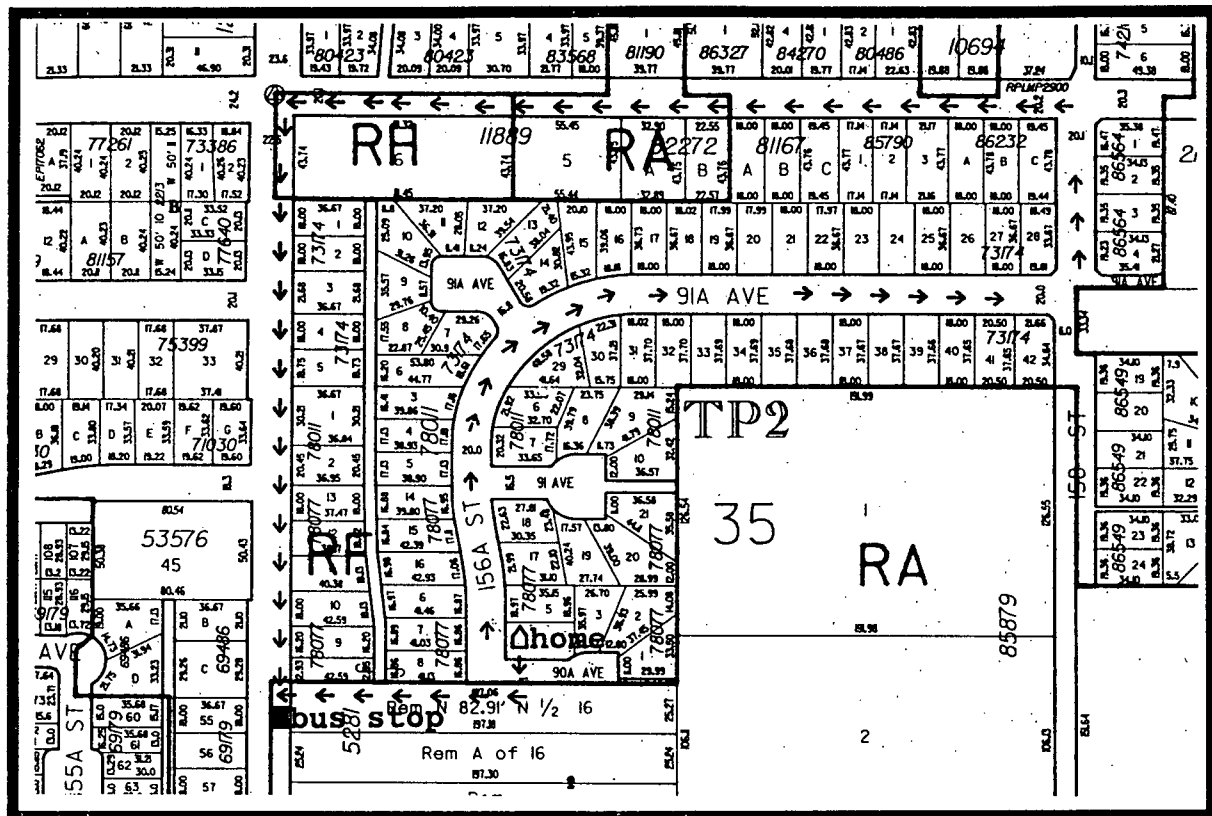


Figure 9.2

The map illustrates the 150 metre distance to a bus stop "as the crow flies," and the much longer walk of 1250 metres to get to the bus stop.

9.4 The Pattern of Circulation

The review of streets and walkways proposed in new subdivisions is based on engineering standards for road width and road length, and on developing easy routes to get to local schools and parks. Transit is not considered during this review process. This omission causes streets to be developed which increase the distance to the local transit route.

An example of this came to my attention a few months ago, when an angry resident phoned to complain about the lack of a walkway from the cul-de-sac in which he lived to the local bus stop. The bus stop was 150 metres from his front door. For the past few

years, he was walking across an empty lot to get to the bus stop. Surrey had not considered the need for an east-west pathway to the bus route, and when the lot was developed, the man's shortcut was eliminated. The man is now forced to follow the local road system in order to get to the bus stop. His walk increased from 100 metres to 1,250 metres decreasing the convenience of transit considerably. (See Figure 9.2.)

Neotraditional planners blame circulation problems, like the one described, on the style of road pattern and suggest that rectilinear street grids provide a better alternative.

Whether or not they follow a strict grid, neotraditional projects reject the curvilinear streets and culs-de-sac that have long dominated suburban design in favour of more formal street layouts. They emphasize providing a system of through connections that give drivers [and pedestrians] alternate routes between two points, rather than funnelling all vehicles into a few collector streets and arterial highways.¹²

Though grid systems do work well, many developers are unwilling to use them because the percentage of land taken up by roadways is higher than with cul-de-sac systems. Developers are also aware of the market preference for cul-de-sac designs that eliminate through traffic, and increase people's perception of street safety.

A cul-de-sac street pattern can be designed to allow easy access to popular pedestrian destinations. In Surrey, and other growing municipalities, planners review road layouts to ensure easy access to schools and parks. A similar approach can be adopted for transit, whereby direct routes to the local transit system are incorporated into the overall design.

The Transportation Association of Canada states:

Local streets should be laid out to provide convenient and direct access to bus stop locations. This objective in no way precludes the careful use of crescents and culs-

de-sac; it is the orientation of these streets which is important, rather than their form.¹³

Figure 9.3 illustrates how a similar road layout can be altered to create a more direct route to the local bus stop. The problem with the system remains the lack of choice, if a transit route is to the south of the subdivision, but the local elementary school is to the north, one key destination is going to be less accessible with either option.

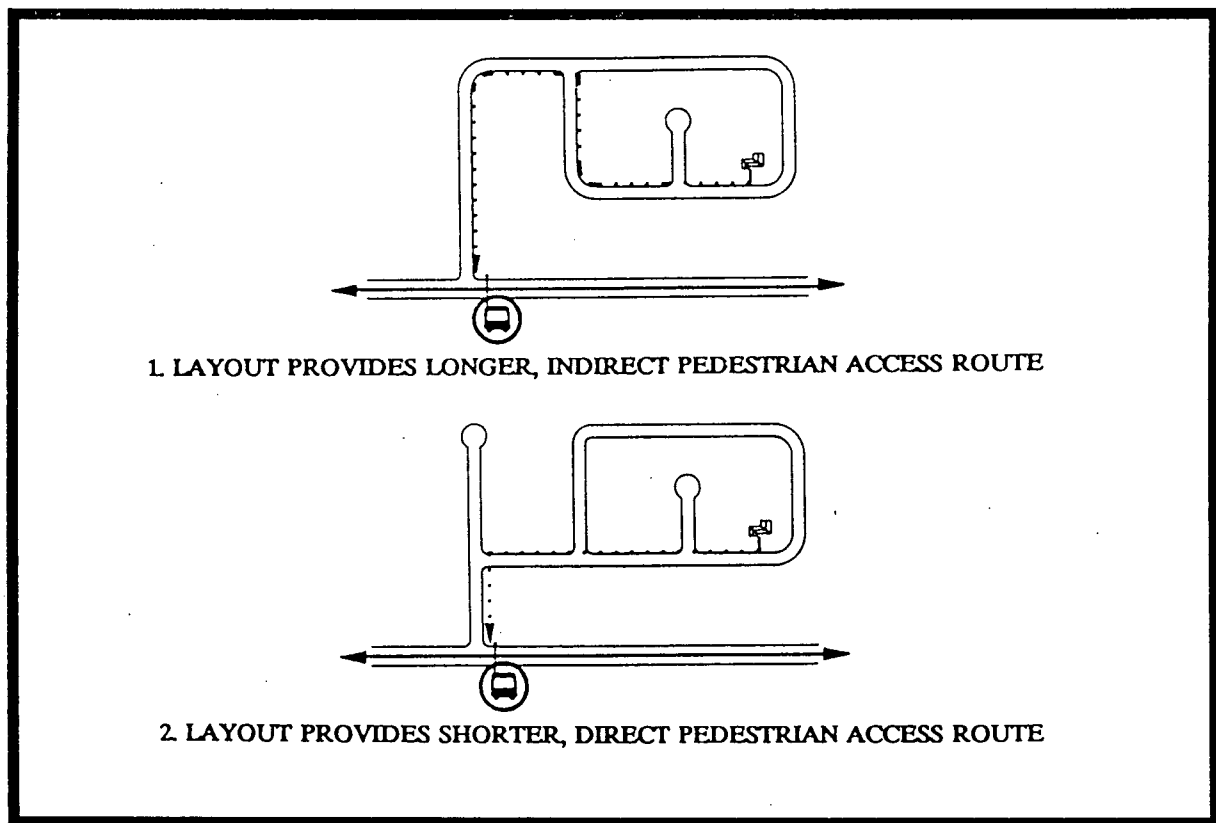


Figure 9.3
Road Layout

Source: Bowes, Gravel, and Noxon, Guide to Transit Considerations in the Subdivision Design and Approval Process, p. A-11.

Circulation and access to local transit must also be considered during the review of development applications. People always take the shortest route:

Regardless of local weather, the aesthetics of the plaza, or anything else, people will take the shortest and straightest route between the sidewalk (bus stop, car drop-off, intersection) and the nearest building entry.¹⁴

Designing building entrances to be closer to the sidewalk and the bus stops, or creating pleasant walkways that lead from the sidewalk to the building entrance encourages transit

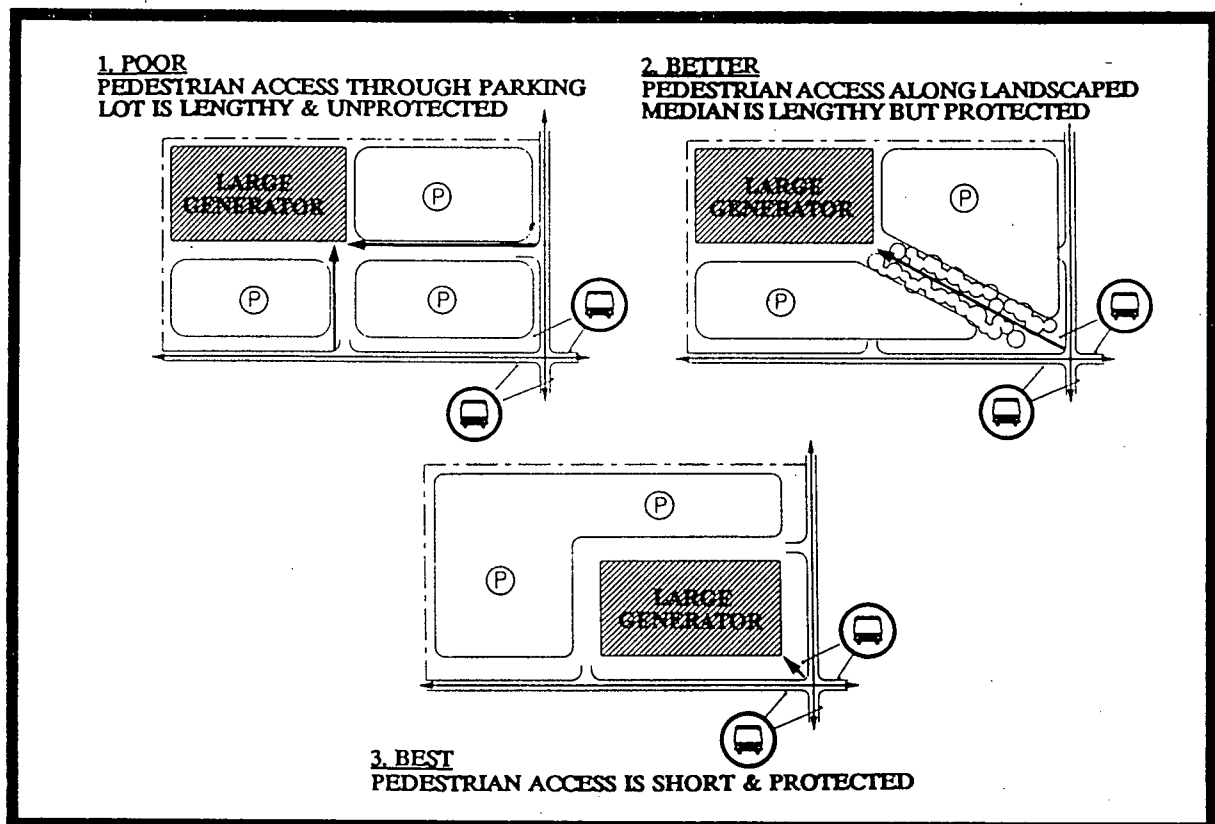


Figure 9.4
Transit Friendly Design

Source: Bowes, Gravel, and Noxon, Guide to Transit Considerations in the Subdivision Design and Approval Process, p. A-6.

use. Pedestrians, and transit riders should not be forced to walk across a wide expanse of parking or across a muddy lawn in order to get to the main entrance of the building. (See Figure 9.4.)

Shopping centres and big box stores are particularly problematic because they prefer to place their parking lots in full view of passing traffic, and dislike creating pathways through parking lots because the pathways decrease the total number of available parking spaces. Revising zoning regulations to reduce setbacks, and incorporating transit requirements into the design review process are two ways of improving the current practice.

Circulation must also be considered when designing the transit facility itself. People arrive at transit facilities in a variety of different ways, by transit vehicle, on foot, or dropped off by cars. Provision must be made for the full variety of users and the pathways they take. Phibbs Exchange, the bus loop in North Vancouver, next to the Second Narrows bridge, is not designed to accommodate transit riders who are dropped off by cars. Consequently, drivers stop on the Trans Canada Highway to drop off transit riders, who then slide down the steep grassy slope to the bus loop.

Broadway SkyTrain station, at the corner of Broadway Avenue and Commercial Drive, conveniently accommodates pedestrians walking along Broadway, but is poorly designed for pedestrians coming from the south along Commercial Drive. As a result, many transit riders use a short-cut along a dark alley and around the back of the southern entrance to SkyTrain.

Both of these examples illustrate how the designs for these transit facilities did not successfully anticipate the circulation demands of the transit users.

Similar problems arise from the design of streets at transit facilities. The westbound bus stop on Broadway, in front of the Broadway SkyTrain station, is heavily used especially during rush hour. The sidewalk is quickly blocked by people waiting for the bus, forcing other pedestrians to push their way through the crowd, or walk around the crowd into the road or into the mud. The sidewalk and the entrance could have been designed so that there was more space and transit riders could wait away from the street providing pedestrians a clear path.

9.6 Conclusion

The transit trip can be improved if the streets people use to go to and from transit, and the transit facilities themselves are designed with the users in mind.

Successful designs will add to the quality of the public realm. Designs may add to character, create local landmarks, or add amenities to the community.

Designs should consider the variety of the uses that will occur on the site. Streets will be used by pedestrians, cyclists, transit customers, and the drivers of automobiles. Each user group has different requirements that should all receive thought and attention. Similarly, transit facilities have the potential to accommodate a variety of secondary uses including public plazas, restaurants, and retail space.

Understanding who uses a site and how they may wish to use it will enable the planner to successfully anticipate the patterns of circulation.

Insufficient consideration is given to transit users when road patterns, and pathways are designed. Nor is sufficient thought given to how pedestrians arrive at, depart from or move through sites. Giving more attention to the circulation patterns of pedestrians and transit riders will shorten and improve the quality of the walk to and from transit, and circulation through the transit facility.

Chapter 9.0 Endnotes

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5. Edward Beimborn et al., Guidelines for Transit Sensitive Suburban Land Use Design (Washington, D.C.: Urban Mass Transportation, 1991), p. 5.
6. Boris Pushkarev and Jeffrey Zupan, Urban Space for Pedestrians (Cambridge, Massachusetts: MIT Press, 1975), p. 15.
7. Richard Untermann, "Streets Are For Sharing," Landscape Architecture 80 (July 1990), p. 56.
8. In Surrey there is pedestrian activity on streets in Newton despite the lack sidewalks. In this neighbourhood there appear to be more people who are in the habit of walking places.
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Figure 10.1

Hannover, Kurt Schumacher Straße

This bus stop by Alessandro Mendini was designed to stand out from the poorly planned neighbourhood in which it is found.

Source: Brandolini et al., BUSSTOPS, p. 37.

10.0 DESIGN AND AESTHETICS

10.1 Introduction

Chapter Nine began the discussion of urban design by recognizing the importance of designing for the potential users of a site and understanding how they will want to use a site.

Chapter Ten continues with the discussion of urban design but focuses on on-site design and aesthetics. The following criteria for designing sites are considered: the context of the site; the character of the design; the legibility of the design; and the comfort and intrigue of the design.

Using these criteria during the design process can address the concerns raised in Part Two of the thesis thereby improving the quality of the streets and transit facilities. Legible design helps people use sites and decreases the need for signage. Users will be welcomed and encouraged through the use of quality materials and with attention to detail in design. Incorporating decoration and art into a good design adds a level of intrigue that will improve the trip and give riders something to look at and think about.

10.2 Context

Popular and attractive urban areas tend to be those in which a contextualist approach has prevailed. By that I mean the process of examining the town or city as a whole and relating changes or new development to it in a sensitive and careful manner....retaining as much as possible of what is good and worthwhile, and adding to and enhancing it, with the aim of creating a new whole which is greater than the sum of its parts.

Francis Tibbalds¹

Consideration of the area surrounding a site is necessary to any design process. Transit design is no different. New development should acknowledge the character of the neighbourhood in order to add to the harmony and quality of whole area. Lynch and Hack write:

New growth must respect its setting...We look for an integrated townscape, a harmonious fabric of parts diverse in function and age....Certain elements may be critical in generating the character that one wants to reinforce: the skyline, perhaps; the texture of ornamental enrichment; the sense of scale; the type of activity on ground floors; certain familiar cultural symbols; a characteristic way of enclosing space; a play of light. But these key attributes are teased out by an attentive study of that particular place and tested by considering the real effect of any addition.²

Studying the context of the site and designing in harmony with the setting is important for the design to be accepted by the local community. Successful transit facilities fit in and are readily accepted and appreciated.



Figure 10.2
Calgary, Sunnyside Station
 Source: Signe Bagh, Planner.

Design is a tool that transit systems can use to improve the image and acceptance of a new transit route. Portions of Calgary's rapid transit line were strongly protested by residential communities who did not want a transit route in their residential neighbourhood. Sunnyside Station, uses cedar shakes and shingles and a low tech style to fit with the residential character of the neighbourhood (see Figure 10.2).

An alternative contextual design approach is proposed by Christopher Alexander in his book A New Theory of Urban Design. Alexander suggests that design be done incrementally, with each new development reacting to the existing structures and spaces in such a way as to improve the whole. His approach requires each proposal demonstrate

how the area is improved by the suggested development.

This justification of design proposals could be used by municipalities in their review of development applications. When reviewing an applicant's proposal a municipal planner could speculate as to the potential benefits the design has for the overall design of the community. This type of approach forces developers and designers to consider the broader context and the impact of their proposal on the local area. A checklist could be developed that would ask the following questions:

- What does the proposal do to improve the adjacent street-scape?
- What public amenities does the proposal provide?
- Does the proposal increase safety on the adjacent streets?

Street design is important to the pedestrian and the transit user as discussed in earlier chapters. Street design is improved by using a contextual approach when choosing street furniture. Establishing neighbourhood colours or styles for street furniture can help add a sense of unity between the pieces but this is not possible for all of the items. Streets are cluttered with a chaotic medley of street furniture. Mailboxes, public telephones newspaper boxes, no parking signs, bus stops, advertising signs, garbage cans, street trees and lamp-posts are all provided by different organizations. The design of each item addresses its function but no effort is made to coordinate the items.

Traditionally the selection and placing of individual street furniture items has been in the hands of engineers and treated on an ad hoc basis, with the result that no coherence or design theme is usually evident. The items are often selected for their initial low cost, rather than appropriateness, durability, and aesthetic merit, reflecting an expedient attitude, rather than a considered design approach with attention given to detail.³

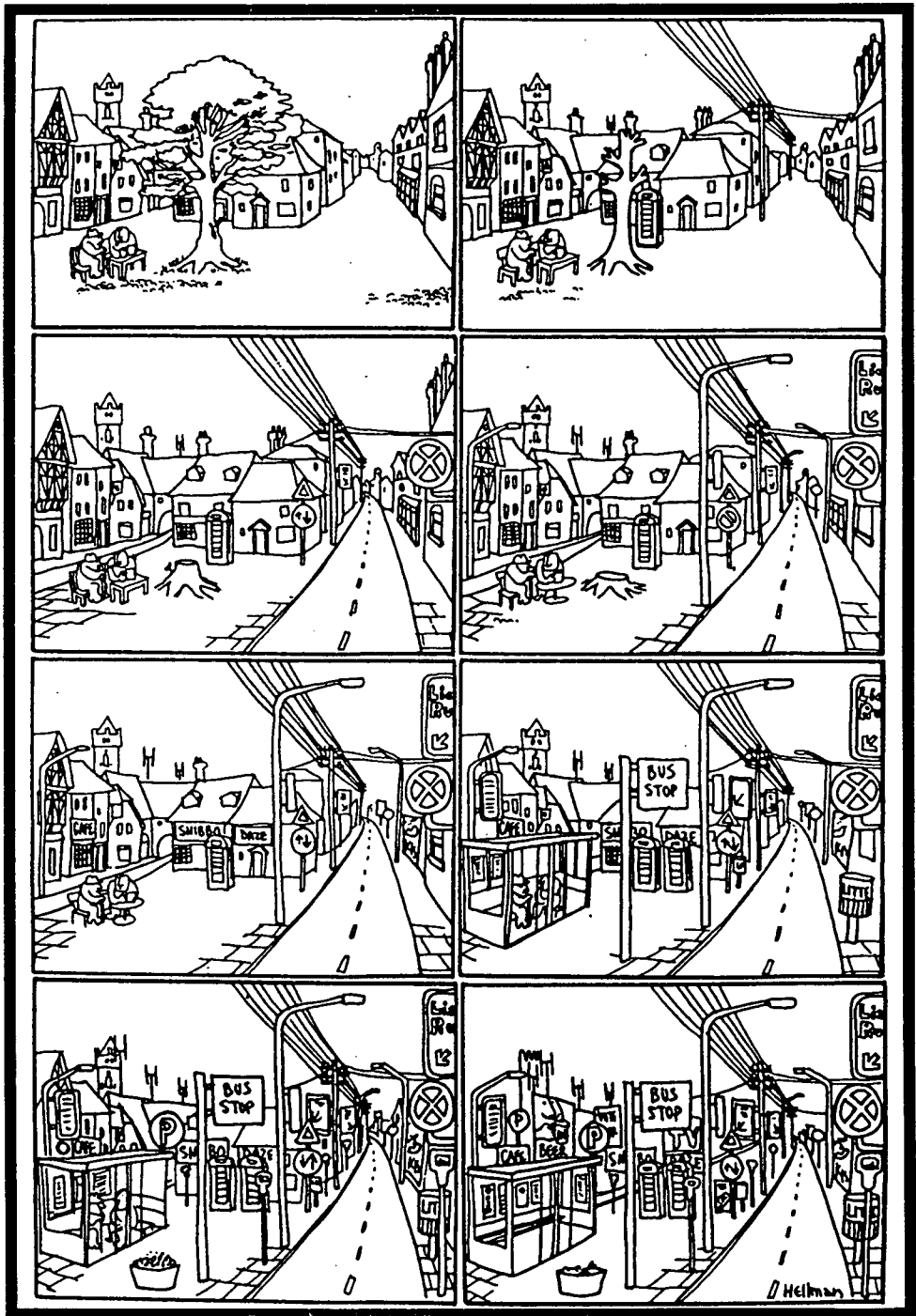


Figure 10.3

The Proliferation of Clutter in the Street

Source: Hellman, untitled, Town and Country Planning 57 (March 1988), p. 86.

Streets can be rescued if municipalities take action and coordinate street design and street furniture. Sidewalks can be designed with widened areas at intersections to accommodate bus stops, benches, shelters, newspaper boxes, mailboxes and public telephones. Grouping these amenities would help pedestrians find them and add convenience to the transit trip.

Modern street furniture companies are coordinating furniture design so that municipal signs, garbage cans, planters, and lighting can all be attached to the same post.

One of the greatest benefits of a coordinated street furniture system, is that the various elements can also be grouped more easily. A bus shelter or kiosk could for example become a support for other elements such as lighting, signs, advertisements, benches or telephones.⁴

Street furniture provides opportunities to improve the urban environment:

There are a number of missed opportunities in the British urban street scene when compared to other countries in Europe such as Germany. There the street furniture goes beyond seats and plant containers and encompasses other furniture such as fountains and other water features, pieces of sculpture or various items of toddlers' play equipment. These all serve as focal points of interest in the streets as opposed to being purely functional items.⁵

Downtown Portland's streets are wonderful to walk along or stand in while waiting for public transit. The quality of Portland's streets begins with the coordination of the street furniture and includes mature street trees, brick sidewalks, seating, water fountains, and lots of wonderful public art (see Figure 10.4).

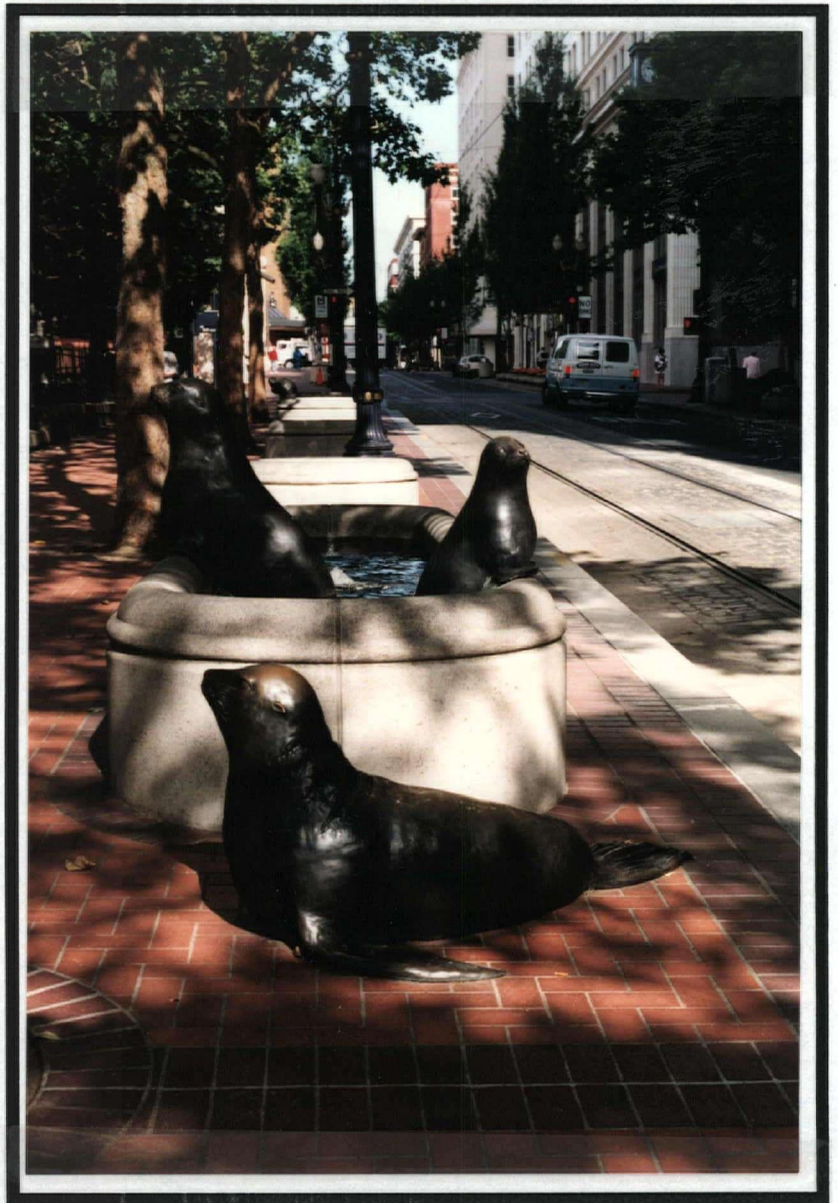


Figure 10.4

Portland, Yamhill Street

The seals, designed by Georgia Gerber, are examples of the public art found along the transit routes in downtown Portland.

10.3 Place Making

There is a spectre haunting America. It is not the spectre Karl Marx wished upon us in the opening of his *Manifesto*. It is a spectre created of our own design. It is the spectre of placelessness. We have created a banal sameness everywhere in America. It haunts the old commercial strip on the road to the airport as well as the sparkling new development downtown. Vladimir Nabokov satirized it in *Lolita*, James Dickey drove us through it on the way to *Deliverance*, and Alistair Cooke dammed it in *America*. Many of us live, and move, and have our being in spaces that never become places.

Fleming and Tscharner⁶

Transit facilities should be special places that add liveliness and beauty to a community. Large and busy transit facilities focus activity and can be developed into lively urban centres. Smaller local transit stops can help to create local neighbourhood centres. All transit facilities and public streets should be designed to create charming, beautiful, delightful places as opposed to a purely utilitarian spaces.

Railway stations built during the nineteenth century provided excitement and comfort with the anticipation of travel and the provision of cafes and restaurants. Turn of the century architects designed subway stations with the same splendour as the traditional railway stations.⁷

Hector Guimard's designs for the Paris Metro are wonderful examples of design for mass transit. Similar examples of high quality subway designs are re-surfacing through New York's "Adopt a Station Program." This program was designed to improve the current condition of the New York subway stations, and has lead to the renovation of some of the

older stations including Astor Place Culture Station.

The site of much cultural activity in the nineteenth century, and urban disrepair in the twentieth, the area has recently been revived....The station originally incorporated glass tiles and terra-cotta faience, and was decorated with beaver images - the symbol of the wealthy Astor family that the station was named for. Restoration of these motifs has been significant in the design by Rolf Ohlhausen of Prentice and Chan, Ohlhausen. Tiles and plaques are to be replaced and a cast iron glass kiosk that originally was located at the head of the stairs is being rebuilt....It appears that Astor Place will once again become a true public plaza.⁸

Modern designs of transit facilities are often functional but not delightful. A few examples of a more exciting design approach exist. Greg Baldwin, one of the designers of Portland's rapid transit facilities, recognized the importance of creating a special place:

[W]e [Zimmer Gunsel Frasca] recognize that we are always creating a civic architecture, something that needs to be special and reflect the very best aspirations of the citizens we hope to serve.⁹

Likewise, Lothar Romain, one of the coordinators of Hannover's "BUSSTOPS" a bus stop design competition, noted the role of small scale improvements to quality of life in the city:

In the case of BUSSTOPS, this clearly and simply means experiencing the time you wait for your bus or your tram not just as wasted time, but as a short break at a special place, as a bid to your senses. This may not improve the world, but it makes it more pleasant and more personal for that moment when the passenger can feel he is being looked after and taken seriously, being valued in the best sense of the word.¹⁰

The importance of creating enjoyable and pleasant places is not widely demonstrated by public transit design. Nonetheless some designers do recognize the importance of inspiration in the public realm. Edmund Bacon in his discussion of urban form refers to the city as "people's art," and continues:

To fail to provide any coherent vision of a finer, healthier, and more inspiring city

is to fail to provide people with something to which they can react.¹¹

Clare Cooper Marcus and Carolyn Francis state that a successful open space should be "beautiful and engaging on both the outside and the inside."¹² Similarly, Crowhurst-Lennard and Lennard, authors of Livable Cities, suggest that public art must, "create a sense of joy, delight and wonder at the life of the city."

BC Transit facilities are functional, but there are few aspects of the design of these stops and stations that could be considered delightful. Some aspects of the system offer hope. There is a small bench made of a tile mosaic at a bus stop on Davie Street that Pamela Tarlow-Calder of the Vancouver Craft Museum claims alleviates two minutes of boredom each time she waits there.

Waterfront Station designed by Swan Wooster and N. D. Lea in 1986 provides a pleasant and functional marriage between the modern system and the original Canadian Pacific Railway Station designed by Barott, Blackader and Webster in 1912. Burrard Station provides pleasant public plazas that are enjoyed by local office workers throughout the day. King George Station provides a 180 degree panorama of the mountains and Surrey City Centre.

The majority of BC Transit facilities are not delightful. Nor was any attempt ever made to improve them. Without a conscious attempt by municipalities, BC Transit, and local arts organizations there is little hope that these transit facilities will ever do more than the minimum.

10.4 Legibility

A good building that understands the rules explains itself in its forms and spaces, tells us where to go and what to expect. It emphasizes those parts that are public and important. Even in the smallest house there is a distinction between back and front doors, between living-room and attic windows. Only in recent large buildings have we lost this sense of hierarchy, so that it is hard to discover whether the block at the end of the street is a hotel, office or civic centre.

HRH The Prince of Wales¹³

It is important for people using buildings and open spaces to know where they are and which direction to take. Entrances must be obvious and welcoming to all users. Pathways should be explicit and destinations visible. Clare Cooper Marcus and Carolyn Francis write:

An open space should: be located where it is easily accessible to and can be seen by potential users; [and] clearly convey the message that the place is available for use and is meant to be used.¹⁴

Legible designs let people know that spaces are for specific uses. The entrance should encourage and invite people into the space while proudly proclaiming what the space is for. The use of the old Canadian Pacific Railway Station at Waterfront SkyTrain and SeaBus Station provides a pleasant entrance and lobby to the transit facility behind. The shape of the building, and the comfortable lobby area combine to provide a welcoming entrance:

Steps and escalators are common barriers to transit use that force people who have

problems using stairs to search for the elevators thereby increasing the need for signs and decreasing the appeal of a facility. Locating elevators in highly visible locations increases awareness of their existence and decreases the need for signage. The elevator at the Burrard SkyTrain Station is down a narrow corridor that looks as if it is leading to a janitors supply cupboard instead of an entrance to a station (see Figure 6.1).

The newer SkyTrain stations are a little better: the elevators are located more prominently. Central Station, designed by Paul Merrick, has the most visible elevator, enclosed in glass and easily seen from the main platform. However, this elevator at ground level is tucked under the main entrance and less visible to people arriving by bus.

Architectural form, finishing materials and art can all be used to direct people through a space. Most useful is the ability for people to see their destination point. Raddison Metro Station in Montreal provides a good example of architectural form guiding users through the transit facility:

A dramatic escalator core commands the control position in the 50 foot high, vaulted space. While descending, the view is impressive. One feels a sense of grandeur, as both a viewer and a participant. A bridge over the tracks at the foot of the escalator provides a pause in the sweeping movement and allows riders to choose their direction while viewing the platform level as a whole. Smooth and shiny stainless handrails guide movement tactilely and visually. Suspended overhead lighting and indirect lighting in coves along the walls are used to identify pedestrian movement, highlight the form, and provide illumination. The ceramic tile floor finish defines the station platform area, and delineates direction to the platforms.¹⁵

SkyTrain has the advantage of being above ground, and therefore provides transit riders with a view of the area they are passing through and arriving at. Once passengers

disembarks, they are usually able to view the surrounding area and nearby bus stops from the SkyTrain platform, providing reassurance of the direction required. However, as development occurs at and around SkyTrain stations views are blocked and reduced, decreasing the information available to transit riders. In these cases, new and additional methods of illustrating pathways and destination points will be required to facilitate transit riders unfamiliar with the area or transit facility.

10.5 Comfort and Intrigue

For the past twenty years, the main thing to look at while waiting for the subway in Harvard Square has been the advertising posters for two competing funeral parlours. Many regular passengers learned the words of those posters by heart out of sheer boredom. A while ago, one of the funeral parlours produced a new poster with a large reproduction of a Corot painting. It is a poor quality, monochrome reproduction, but it probably gets more viewing time than any other painting in the Boston area.¹⁶

Design can enhance what people do while waiting and how they feel about it. Visual interest, the social environment and seating play a part.¹⁷

The relationship between the transit provider and the transit users is similar to that of host and guest. While using public transit the rider becomes a guest and expects the host to tend to their comfort. Transit facilities that are uncomfortable or appear cheap suggest to the transit rider that they are endured rather than welcomed. Conversely, transit facilities that are luxurious welcome the transit customer and invite them to come again.

Municipalities share a similar relationship with their citizens. Municipal governments are

the agencies of the citizens and therefore public projects should attempt to welcome citizens, encourage use, and celebrate the municipality.

Design should accommodate the needs of the users in order to encourage use. This applies to all design. Clare Cooper Marcus and Carolyn Francis address the needs of users in their list of criteria for public spaces. Their comments can be applied to transit facilities and streets just as readily:

A public place should: be furnished to support the most likely and desirable activity; provide a feeling of security and safety to would be users; where appropriate, offer relief from urban stress and enhance the health and emotional well-being of its users; be geared to the needs of the user group most likely to use the space; encourage use by different subgroups of the likely user population, without any one group's activities disrupting the other's enjoyment; and offer an environment that is physiologically comfortable.¹⁸

People use places if the places are designed to be used. A simple example is provided by William Whyte's studies of open spaces in Manhattan. Whyte noted that, "people tend to sit most where there are places to sit."¹⁹

The SkyTrain station platforms provide eight seats on either platform. These eight seats are often full, but that does not mean that only eight people at any given time want to sit down. If SkyTrain provides more seats, more people will sit.

Comfort means more than the provision of adequate seating, though seating is important. Comfort includes shelter, lighting, and the provision of visually interesting surroundings. Stark surroundings cause people to withdraw, while people become more lively in

comfortable surroundings.²⁰

Visual interest can be provided by good design, attention to detail, decoration, and the provision of public art. Decoration is largely missing from modern transit facilities but examples of elaborate tile work, or fancy wrought iron do still exist to remind us of past glories. Public art is far more common, and is growing in use and popularity.

Hannover's public art "BUSSTOPS" exhibition turned real bus stops into pieces of art. Twelve bus stops were created, each providing shelter, seating, light and a place for schedules and advertising. This project was unique in turning the entire transit site into a living sculpture as opposed to adding or hanging a piece of work at or near a transit facility. The bus stops are wonderful to look at, and have added to the street life and character of the areas into which they were placed.²¹

Illustrated below is Wolfgang Laubersheimer's bus stop design. In coming up with his design, Laubersheimer thought about the waiting period and concentrated on providing waiting room entertainment. His bus stops are whispering galleries, which project words whispered in one seating area to a second seating area (see Figure 10.5).²²

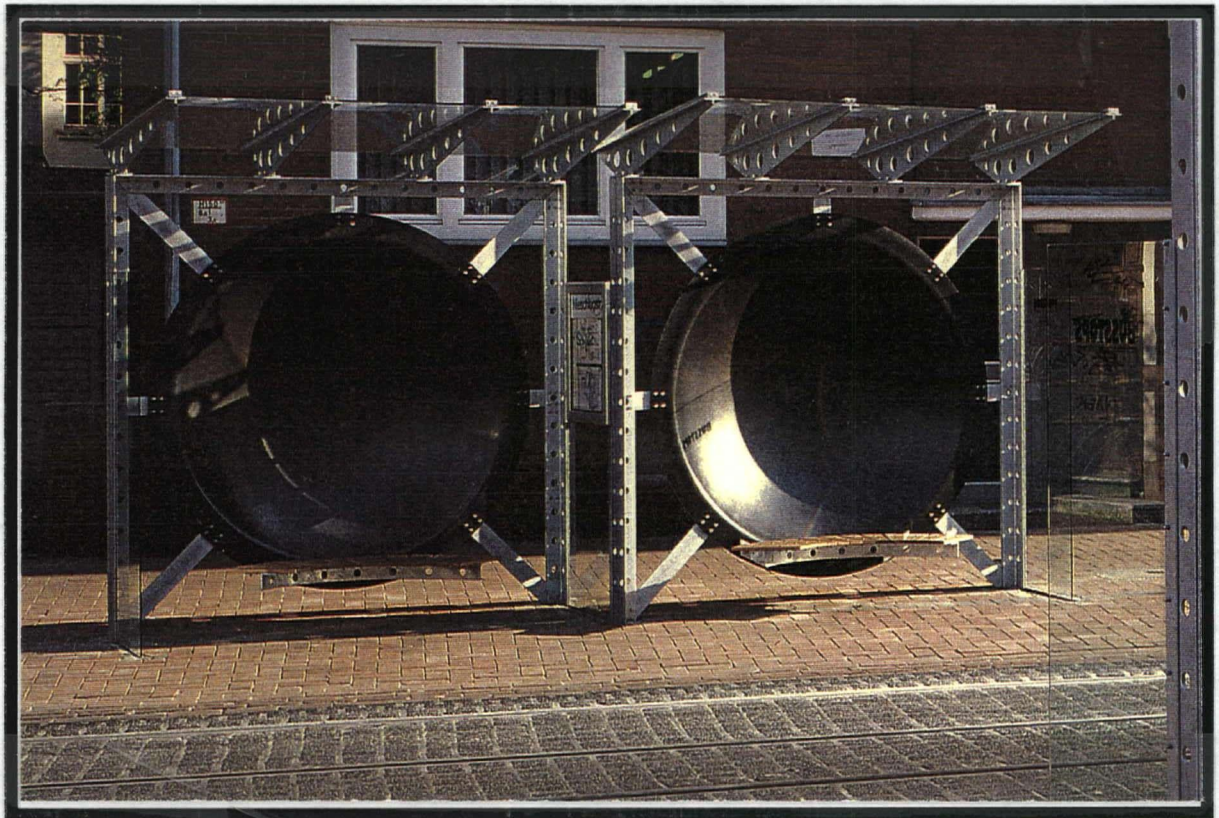
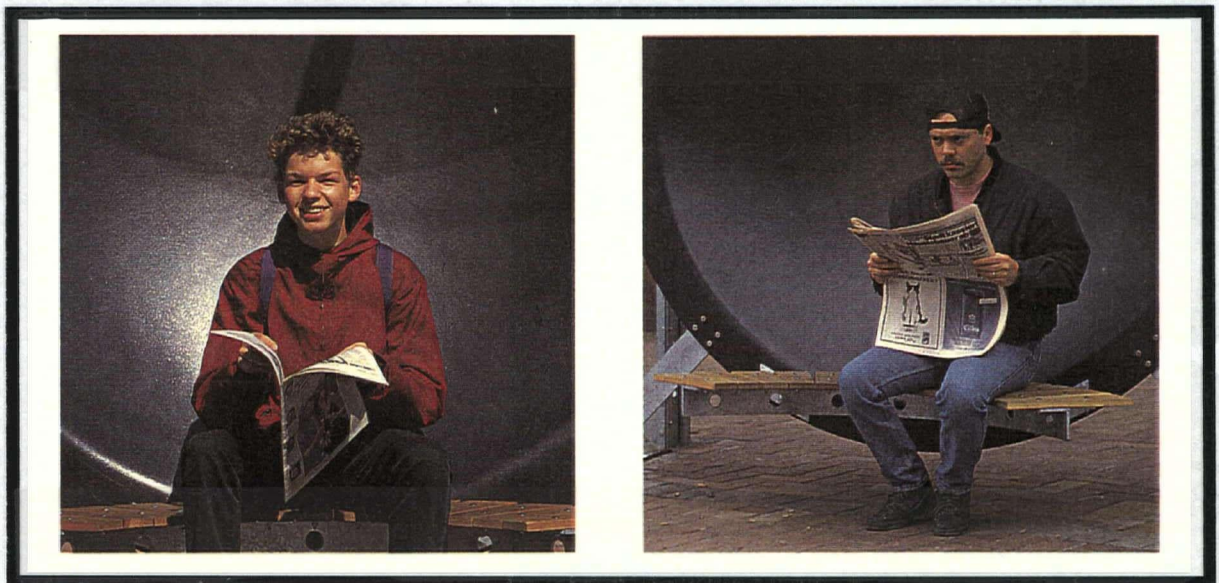


Figure 10.5

Hannover, Nieschlag Straße

Whispering gallery bus stops designed by Wolfgang Laubersheimer.

Source: Brandolini et al., BUSSTOPS, p. 30 and 33.



Entertainment was also a key consideration of film maker Bill Brand who worked with New York's subway system to provide an installation entitled, "Masstransitscope." The installation consists of 228 sequential paintings that from a passing train look like an animated cartoon.²³

In 1980, New York initiated the Adopt-a-Station program to rejuvenate the subway system. Artists and designers involved in the program were encouraged to study their stations as if they were the most important places in New York. 14th Street / Union Square Station has a new mural depicting the plaza above the station. 5th Avenue / 53rd Station and Lincoln Centre / 66th Street Stations also connect with the world above the stations by providing schedules and program information of the shows playing in the theatres at ground level. Six video screens are installed to provide transit riders with glimpses of the live performances occurring in nearby cultural centres.²⁴



Figure 10.6
Seattle, International District Station
Sonya Ishii's art installation is displayed at platform level.



Figure 10.7

Seattle, Pioneer Square Station

This display at mezzanine level is of a wheel used at the turn of the century in the operation of a local cable car.

Seattle's Metro System recently opened a transit tunnel for buses through the downtown area. The tunnel has five stations and well over 50 different art installations that succeed in bringing the character and life of the city underground. Unfortunately, the majority of the artwork is located in the station mezzanine areas and not at the platform area where people wait. The International District Station does provide a striking installation at platform level designed by Sonya Ishii that includes nine panels depicting origami patterns (see Figure 10.6).

Seattle has also initiated a bus stop mural program. The program was started in 1988, in an attempt to cut down on vandalism at bus stops and involve the community in the provision of transit facilities. The program invites high school students to design murals to be painted at bus stops. Once a design is approved, Metro provides the art supplies and students provide the talent. The program has been successful in several ways. Firstly, there are now 340 bus stop murals, many of which are carefully designed and enjoyable to see. Secondly, the students are involved in the upkeep of the transit shelters and there is a 20% reduction in vandalism requiring glass replacement. Thirdly, more people are learning about and being introduced to the public transit system. And finally, Metro is having an easier time locating new bus stops and maintaining existing bus stops because bus stops with murals are less likely to receive complaints from local property owners requesting they be moved.²⁵

Transit systems have also begun to recognize the benefits of buskers. In 1984 the New York transit police handed out 671 summons to musicians playing illegally on the subway platforms. Policy has changed, and New York's Metropolitan Transportation Administration now encourages musicians to play at transit facilities. William Whyte noted the success of encouraging buskers stating, "people are surprised and delighted when they come upon a brass quintet down on a platform." Whyte adds that people comment on the calming effect the music has on the transit trip.²⁶

Other art projects have used the advertising space at bus shelters, transit stations and on the transit vehicles. "Poetry on the Buses," was an initiative funded by the American

Urban Mass Transportation Administration which provided 28 posters combining poetry and art to American transit systems.²⁷ During 1992 and 1993, Seattle's Metro transit system had six buses that had poems rather than advertising in the interior of the bus. The poems were selected from over 1,000 submissions made by residents of the Pacific Northwest region.²⁸

BC Transit's Marketing Department has been involved in two art installations initiated by a local arts group called Active Artifacts. However, interest in art on transit is low, as is demonstrated by the lack of awareness of these installations by BC Transit staff.

10.6 Conclusions

Design can be used by transit systems as a tool to improve image of the transit system and to encourage use of the system. Designs that are sympathetic to the characteristics of a neighbourhood are more readily accepted by the residents of the area. This is an important method of diffusing public opposition to transit routes, as demonstrated in Calgary.

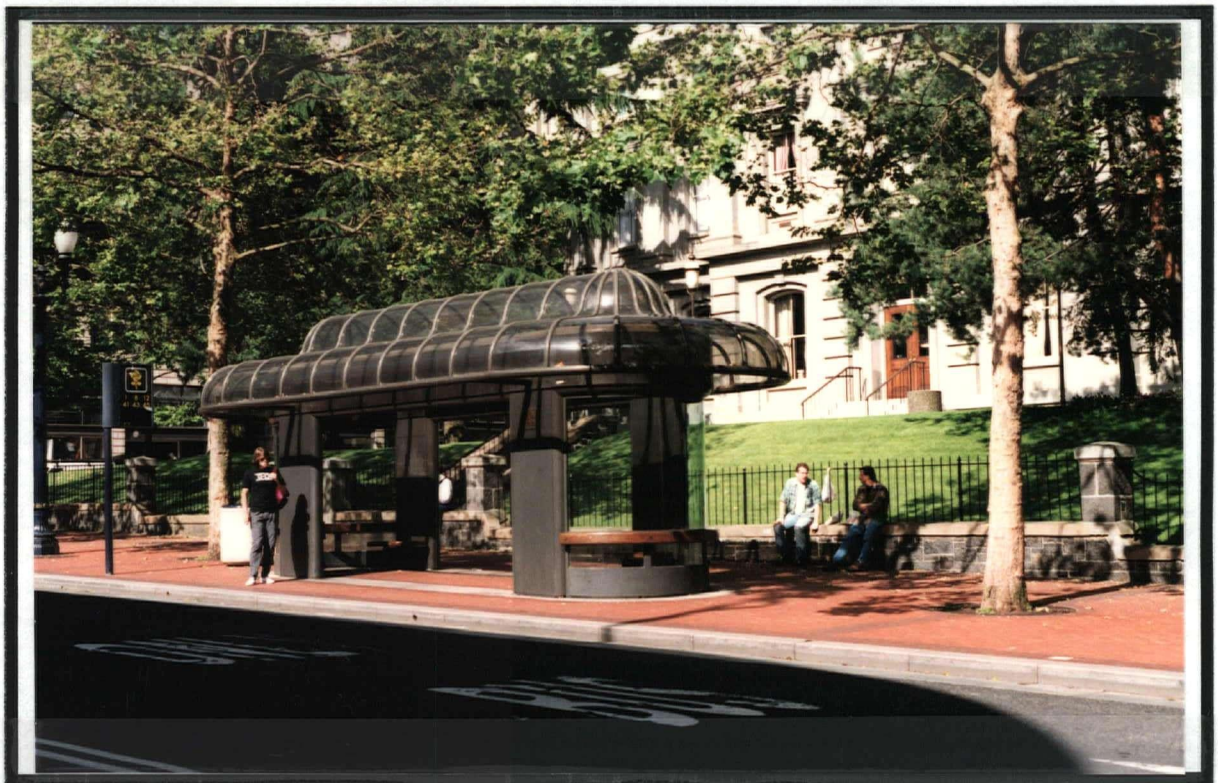


Figure 10.8 and 10.9
Portland's Transit Mall



Transit facilities and public streets offer opportunities to design places that attract use and add excitement to an area. Woolwich Arsenal Station in London, and Portland's transit mall are examples of transit facilities and streets that are special additions to the activity and design of the larger areas they are located in (see Figure 10.8).

Transit facilities should be designed to encourage and welcome transit riders. Entrances, pathways and destinations should be clear from the design of the built form. Barriers to access should be avoided and main entrances should be accessible to all. Radisson Metro Station in Montreal provides an example of the architectural form of the building leading transit riders from the entrance down to the platform area. Buildings that provide clear pathways and destinations encourage use and decrease the necessity and reliance on signs.

Using art, decoration, and detailing in the design of transit facilities and streets adds to the overall comfort and enjoyment of transit. An artist working at a transit facility has a greater impact and is appreciated by more people than in almost any other venue. Transit riders enjoy the break in the monotony of the transit trip, and consider the quality of the trip to be improved. Improving the quality of the transit facilities adds to the perception of caring and decreases the likelihood of vandalism. Art and transit are a winning combination that benefit all of the parties involved.

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Conclusion To Part Three

In this section of the thesis the use of planning and design to improve streets and transit facilities was discussed. Planning and urban design principles can address many of the concerns raised earlier in the thesis including: safety, comfort, the need for information, access, and boredom.

Good planning and design can do more than just address concerns, it can provide excitement and beauty to a community and customers and support to the transit system.

Land use plans can support transit use and users by increasing the convenience of the transit route or transit stop. Focusing transit compatible land uses adjacent to transit provides customers to the system and adds convenience to the transit rider. Pro-transit land uses are those which do not require customers to arrive by car. Lumber stores, furniture stores, gas stations, and golf courses are examples of land uses that are not transit compatible and if placed along a transit route would not add riders to the system of be of convenience to the transit customers.

Good design should address the needs of all the users of a site without infringing on any single group. Municipalities should consider the different users of public streets and design them so that pedestrians and bicyclists are welcomed and encouraged. BC Transit should give greater consideration to transit customers in the design of transit facilities.

Customers should be able to arrive safely and easily at the transit waiting area without having to navigate barriers like parking lots, bus driveways, and stairs.

Lastly, incorporating art and decoration into designs can add intrigue and delight to the users experience of the site. At transit centres the installation of art works adds beauty and interest to the site decreasing the boredom of the waiting period.

PART FOUR

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction to Part Four

This thesis has reviewed the concerns people have with transit trips focusing on the pedestrian trips to and from the transit facility and the waiting period at the transit stop. In Part Three the methods of addressing these concerns by altering the way in which streets and transit facilities are planned and designed was discussed. In this section discussion focuses on the groups that can implement the changes required to improve the transit trip.

Discussion has focused on the two primary groups involved in the provision of streets and transit facilities; municipal governments and BC Transit. These organizations are the key players involved but they do not act in isolation. Chapter Eleven will discuss all of the players who should be involved in planning for transit, and review the methods by which these organizations can effect change.

The Government of British Columbia is responsible for both BC Transit, a crown corporation, and the roles and responsibilities of municipal governments by means of the Municipal Act. The Greater Vancouver Regional District (GVRD) is our regional government and functions as a forum for regional discussion and planning. Both

governments have the potential to influence planning in the Vancouver region.

Developing at or adjacent to transit routes can make good business sense. Joint ventures can be developed between private enterprise BC Transit and local government to develop mixed use centres at transit stops and stations. Working with the private sector offsets the development costs associated with new transit facilities and provides extra convenience and amenities to transit users.

Business Improvement Areas (BIAs) involve local merchants in promotional campaigns to increase business. Among the techniques used are beautification projects to enhance the appearance of the commercial district. These types of projects can include the enhancement of bus stops and provision of seating, shelters, lighting, and garbage cans that improve the waiting areas.

The discussion of each of the key players will include a discussion of the methods by which each group can bring about change. Taken together Chapter Eleven provides a summary of the ways in which the transit trip can be improved.

Chapter Twelve presents the conclusions to the thesis and a summary of the recommendations included in the document. The recommendations are listed with the organization responsible and the degree of difficulty for implementing the proposal.

11.0 KEY PLAYERS

11.1 Introduction

Public transit systems affect the cities they are located in providing a catalyst and focus for development at transit centres and along transit routes.

Local government can use transit to spark development. Transit systems can work with local government to ensure that investments in transit infrastructure are supported by appropriate zoning regulations along transit routes.

Private enterprise and public transit systems can gain mutual benefit from joint venture developments. Public transit systems provide a steady stream of customers, a source of transportation for employees and a spur to local real estate development. The private sector's development of transit centres and along transit routes increases ridership and adds convenience to the transit trip.

The most successful transit systems are those that maximize the cooperation between different parties. In Portland Tri-Met, the local transit agency, has worked with federal, state, regional and municipal governments to ensure that funding and policies are in place to support the transit system. Private development and business improvement districts are encouraged to develop at transit centres, and zoning has been adopted to support densification along transit routes.

Successful transit development requires political support for pro-transit decision making. Pro-transit planning requires municipal and regional officials who have divergent interests to focus on transit issues and make land use decisions that support transit use.

In 1960 Jean Drapeau was elected Mayor of Montreal with the mandate to develop Montreal as a metropolis (in preparation for Expo '67) by constructing a modern subway system. Drapeau succeeded, and over his successive terms in office, Montreal developed a first class metro system.¹

In 1990 the Brazilian city of Curitiba received the UN Environmental Award for Achievement (nicknamed the environmental Oscar) because of the efficient transit system. During Jaime Lerner's three terms as Curitiba's Mayor, he was a strong proponent of public transit and designed Curitiba's unique "tube stops."²

Portland, Oregon achieved its success with the Tri-Met transit system through strong political commitment to transit at the local, regional and state levels. The State of Oregon's legislation set the tone for planning in Portland by supporting mass transit and setting environmental goals for transportation. These goals are reflected in the regional planning strategies, and supported at the local level through station plans and transit overlay zones.³

11.1 Government of British Columbia

The Government of British Columbia is the only government with the authority to enforce a land use and transportation plan for the Vancouver region. Anthony Downs came to a similar conclusion in his book Stuck in Traffic in which he states that state governments are the only agencies that can plan for metropolitan areas.

The provincial government has a vested interest in transportation in the Vancouver Region as it has invested sizable amounts in the provision of local highways, and mass transit. In 1993/94 the Province provided \$208.6 million in direct funding to BC Transit's Vancouver Regional Transit System.⁴ However, the Province has not chosen to protect this investment by implementing pro-transit land use planning or supportive legislation.

The Municipal Act governs the jurisdiction and responsibilities of the municipalities. The Province could use its jurisdiction over the municipalities to require municipal plans to incorporate transit planning goals.

Provincial legislation influences municipal planning and is a major determinant of local conditions. The Transportation Association of Canada (TAC) recognizes the "trickle down" influence of provincial legislation and recommends that provinces protect their financial investments by adopting pro-transit legislation.

The Province could require a regional plan to coordinate and manage transportation and

growth. Municipalities could be required to work with the Province to create an effective plan that considers alternative modes of transportation including walking, cycling and mass transit.

The Ministry of Transportation and Highways (MOTH) is working on a Provincial transportation plan and is drawing heavily on the Greater Vancouver Regional District's Transport 2021 Report, but local municipalities have not been required to work with MOTH to coordinate land use and transportation.

The Ministry of Transportation and Highways has the authority to hold back approval of any projects adjacent to provincial highways until such time as they meet MOTH's standards. MOTH could be encouraged to incorporate public transit goals and policies into its guidelines so that projects that are adjacent to transit routes have a lower parking requirement and a more stringent sidewalk requirement.

The adoption of pro-transit policies can have a positive effect on the actions of provincial staff as well as local governments. For example, the Ministry of Municipal Affairs supports downtown revitalization programs and business improvement districts. Through these programs the provincial government encourages neighbourhood enhancement and maintenance to improve the appearance of the street and encourage customers. The provision of bus shelters, public benches, pleasant walkways, and adequate street lighting are a few examples of items that could be part of a revitalization program and improve local transit stops.

The Province's real estate office could locate government offices along transit routes, and at transit stations. Provincial departments and agencies requiring locations in a municipality could share sites with transit facilities providing easy access to the provincial agencies and a source of customers to transit. For example, a Motor Vehicle Branch and a transit park and ride lot could share a space, providing convenience to the transit riders, and informal surveillance of the park and ride lot by the Motor Vehicle staff.

The Province can protect and support its investment in public transit through appropriate transit planning strategies that establish policies and legislation to support and encourage transit use.

11.2 Regional Government

The residents of the region deserve a transit system that is responsive to their concerns and can be coordinated with an overall regional strategy to address the multitude of urban structure and metropolitan development issues facing the Lower Mainland over the next decade. The Regional District provides the best mechanism to achieve regional transportation coordination in concert with an overall regional strategy.⁵

Greater Vancouver Regional District

The Greater Vancouver Regional District (GVRD) is the regional government for the majority of the municipalities served by the Vancouver Regional Transit System.

The GVRD provides a forum for discussion of regional issues among municipal politicians and senior staff. The Technical Advisory Committee consists of local planning directors, and representatives from the Ministry of Transportation and Highways, BC Transit, the

Harbour Commission, and Canada Mortgage and Housing. This committee meets to exchange information and discuss regional planning strategies. The results of these discussions are then passed on to the Regional Administrative Advisory Committee consisting of city managers, and the Strategic Planning Committee consisting of municipal politicians. Through these committees regional policies and plans are formulated and discussed.

Transit planning issues are discussed by the GVRD's committees and board members. The GVRD's recent transportation study, the Transport 2021 Report, included a lengthy discussion of the importance to plan for alternative modes of transportation including public transit, bicycling and walking.

The GVRD serves as a regional planner, a source of information and a forum for discussion. In this capacity the GVRD has produced Creating Our Future: Steps to a More Livable Region and the Transport 2021 Report both of which advocate planning for alternatives to the private automobile. These documents were adopted by the member municipalities but have not become part of municipal planning strategies. The GVRD is unable to force the municipalities to follow through on these plans and strategies because it lacks the jurisdiction over member governments. Instead it can only provide an example for others to follow and source of information and discussion.

In other jurisdictions the regional governments have more power and influence. In some areas the regional government replaces municipal functions, where a regional approach

is beneficial.

Metro Toronto is a federation of six municipalities. Councillors are elected directly to the Metro Council, and local mayors are appointed automatically. The Metro government is responsible for a variety of services including police protection, garbage collection, sewer and water supply, regional roads and mass transit. Transit is provided by the Toronto Transit Commission (TTC) which reports to the Metro government. The TTC provides efficient regional mass transit that is responsive to local governments and regional strategies.

In a proposal entitled Vancouver Regional Transit System, A Proposal for Improving the Structure and Accountability of the Transit Service, the GVRD suggests that it could provide a function similar to the TTC for the Vancouver Region. The GVRD could oversee BC Transit ensuring that the transit system addresses regional strategies for growth, as well as responding to the requirements of the local municipalities.

The Province chose not to follow the GVRD's proposal and continues to support BC Transit's Vancouver Regional Transit Commission. The Vancouver Regional Transit Commission is a provincially appointed body and has no direct accountability to the region it serves.

The 1993 - 1994 Vancouver Regional Transit System budget was divided between provincial funding (45.5%), transit fares (30.5%), and local tax sources (24%).⁶ Local

citizens pay the lions share of transit costs without having direct accountability through elected representatives.

BC Transit's ridership level has stopped growing (decreasing slightly in 1993/94)⁷. Transit service and the development of new routes has not kept up with the growth rate in the suburban area. These are two indications that the provincially appointed Board of Directors and Vancouver Regional Transit Commission have not been successful in building a local transit system.

Shifting the priorities at BC Transit towards regional goals and working closely with regional and local municipalities is necessary for the development of an effective regional transit system.

11.3 Municipal Government

Municipalities are responsible for a range of areas effecting the quality of transit trips including: the design of public streets and rights-of-way upon which transit facilities are located; land use decisions that impact ridership levels and the convenience of transit; and zoning regulations that shape the built form of areas at transit stations and along transit routes.

Municipalities must update their standards for streets so that the pedestrian environment

is improved and walking and transit use is encouraged. Sidewalks, street lighting, street trees, and street furniture should be designed to improve the walkways required by transit riders and pedestrians.

A concerted effort by municipal departments is required to improve the quality of streets and transit facilities. In particular, planning, engineering, and public works departments must coordinate their efforts so that street furniture and sidewalk design is more comfortable for pedestrians and transit riders.

Chapter Nine discussed the symbiotic relationship between land use and transit. Municipalities are the primary agencies responsible for land use decisions. Municipalities can plan for transit incorporating transit corridors or nodes into land use plans. Pro-transit land use can be designated on plans the same way that "Commercial" or "Residential" land uses are. A plan can designate an area for "Transit" and apply specific densities and design standards accordingly.

Municipalities can use land use plans to prioritize transit areas, choosing those corridors or town centres that would benefit most from transit. Incorporating transit into a land use plan provides the catalyst required for development and "the lever to guide urban growth."⁸

Urban revitalization and focused development have occurred in Denver, Portland, Toronto, and Miami, where municipal governments and transit agencies have combined land use

and transit planning.⁹

Another tool available to municipalities to coordinate land use and transit planning are zoning regulations. Specific transit overlay zones can be established at transit nodes or along transit routes to enhance the pedestrian environment within these areas. The City of Portland, and Washington County have both adopted transit overlay zones to support Tri-Met's new Banfield light rail line. (See Appendix II for copies of the transit overlay zones.) These overlay zones reduce front yard setbacks, limit the maximum number of parking spaces permitted, set minimum densities, and encourage mixed use.

Zoning regulations can work with density bonuses to increase the development rights allotted to a site in return for a public amenity. This is more often used by municipalities to obtain public open space within the downtown core. Floor area ratios can be increased if a public plaza is provided, thereby allowing office towers additional office space. A similar relationship can be considered to encourage developers to provide shelter and comfortable surroundings at adjacent bus stops. Bellevue, Washington has used this approach in the redevelopment of its downtown transit area:

Bellevue....will create a "pedestrian friendly" downtown by emphasizing a network of mid-block pedestrian corridors complete with plantings, interesting paving and retail frontages. To accomplish this plan, generous density bonuses will be granted to abutting properties that contribute to this plan.¹⁰

Municipalities can incorporate the principles of transit friendly planning discussed in this thesis into their development application review process. Applications that occur within walking distance (400m) of a transit route could be flagged and reviewed in terms of their

impact on transit.

Applications for land uses that are not compatible with transit but are located on a transit route should be recommended for denial and the applicants should be encouraged to change their proposal. Applications that are adjacent to transit facilities could be required to give special consideration to transit and ensure that their designs support transit use. Direct pathways from project entrances to transit stops, wider sidewalk dedications to accommodate bus shelters, awnings and lighting to improve the shelter at bus stops, and designs that allow for casual surveillance of the bus stop are among the types of issues that could be considered during the review of development proposals.

Planning departments usually circulate plans and applications to referral agencies for comment. Any application or plan that touches a body of water is referred to the Ministry of Environment for their review. A similar referral process should be established for projects occurring in the vicinity of public transit whereby, projects are referred directly to BC Transit or to a municipal employee who is familiar with transit issues.

Municipalities should encourage staff to become familiar with transit issues by inviting BC Transit staff to give lectures and training sessions. In-house transit "experts" should be hired to review municipal policies and plans with an eye to improving transit for local citizens and developing transit policies and plans.

Finally, for municipalities that are serious about promoting public transit, a transit subsidy

should be provided to municipal employees to encourage them to use transit for themselves. The municipality could sell transit tickets and passes at a reduced rate, or obtain special one month passes for a trial period. Alternatively, transit passes could be provided as a bonus to those employees who don't drive their own cars to work and therefore don't make use of the free parking provided to most municipal employees in the Vancouver region.

11.4 Joint Ventures

A symbiotic relationship between public transit and business activity exists. Transit provides quick, convenient access to commercial enterprises and buildings and a concentrated critical mass of customers for business activities. Business activities and private developments generate trips on transit systems and help support viable public transportation. To understand and take advantage of the nature of this relationship and to be market oriented are necessary for a successful integration of business activity and public transit.¹¹

Public transit represents a business opportunity to private enterprise. Transit provides a source of customers which can be exploited by businesses located along transit routes and at transit stations.

Many transit riders like to stop on the way to the transit stop to pick up a coffee or a newspaper. Central SkyTrain Station provides a good opportunity for transit riders to stop at the beginning of the trip and part way through as they transfer from buses to trains. The station area has a recreation centre and shopping centre within easy walking distance as well as a row of store fronts occupied by coffee shops and a RCMP sub-station within thirty

metres of the bus loop. The station area provides a selection of services that add convenience to the transit trip.

The design of the Central Station area has not maximized the development opportunities nor the convenience to transit riders. The store front shops located within thirty metres of the bus loop are around a corner and out of sight of the bus stops (reducing the success of the design). The business opportunity would have been better if the store fronts were located within sight of the bus loop and SkyTrain station entrances allowing people to think about using them as they waited for their buses. Safety at the bus loop would have been improved with casual surveillance provided by the police station and store front employees.

Bus loops and major bus stops provide a ready source of customers for smaller enterprises. Students using the UBC bus loop often stop for coffee after getting off the bus. Many students walk to the Student Union Building (SUB) to buy their coffee. The bus loop is not visible from the SUB due to the landscaping, a grassy embankment, and distance. If the bus loop had been built with a cafeteria next to it, students could wait indoors until their bus arrived, improving the safety and comfort of the transit trip.

Most bus loops are designed with a small concrete bunker to provide washrooms for the unionized bus drivers. No facilities are provided for the transit customers. Designers of new or renovated bus loops should look into the possibility of providing small coffee shops, newsstands (and public washrooms) to increase general convenience and comfort for

transit riders and staff.

In suburban areas many bus stops and bus exchanges are located at or close to shopping centres. For many years shopping centres have been reluctant to accommodate transit facilities on site, mistakenly assuming that transit passengers aren't customers.

Richard Tebinka's review of Winnipeg's shopping centres and transit system indicated that 25% Polo Park Shopping Centre's customers arrived by transit.¹² Robert Cervero's review of other Canadian transit centres had similar findings.¹³ In Edmonton transfer centres have been located at major shopping malls where there is ample land and a supply of transit customers. Cervero writes of the benefit to the shopping centre business:

Merchants, in turn, have benefited from the increase volume of customers dropped off at their front door steps. In several instances, shopping malls have reported significant gains in sales following the opening of on-site transit centres while competing retail complexes without a transit facility were experiencing losses.¹⁴

Urban shopping centres located at transit centres have been even more successful in attracting transit riders. Seventy-five percent of the customers of the Bay Centre at Yonge and Bloor in Toronto arrive by transit.¹⁵

Partnerships between private development and public transit are opportunities for both parties to benefit. Transit provides exposure and easy access to business. Business provides convenient services, pleasant surroundings and increased safety to the transit passenger and a source of customers to the transit system.

One of the most successful examples of joint ventures with transit and private enterprise is the Montreal Metro System. Three major department stores, a public library, over thirty commercial buildings, and over one hundred restaurants are among the services that have direct access to Metro stations.

McGill Metro station designed by Crevier, Lemieux, Mercier and Caron in 1966, provides an excellent example of a joint development. The station platform has an open twenty-five foot ceiling that provides a visual connection to the mezzanine above. The mezzanine connects to Eatons and The Bay department stores, and to Les Terraces and Les Galleries shopping centres. A newsstand is located on the mezzanine across from the main ticket booth for the Metro. Within the station area display windows, interesting architecture and public art add visual interest to the transit rider's trip, even after the shops are closed.¹⁶

11.5 Business Improvement Areas

Business Improvement Area (BIA) organizations are non-profit societies that endeavour to improve an area's commercial viability. Funding for the promotional activities is normally through a sur-tax or "special" tax collected from property owners and businesses within the BIA jurisdiction. Promotional activities vary from advertising projects to market research but normally include area maintenance and revitalization.

The Ministry of Municipal Affairs provides assistance to BIAs undertaking revitalization programs, and as mentioned in section 11.1, could encourage BIAs to consider transit facilities as part of the revitalization plan.

Denver, Colorado's 16th Street transit mall provides a successful example of a downtown revitalization program that was developed in conjunction with the local transit agency:

Businesses along 16th Street represented by Downtown Denver Incorporated [Denver's Business Improvement Area], were experiencing a decline in their share of expanding regional sales and felt that dramatic action was needed to forestall disaster. Meanwhile the Regional Transportation District wanted to relieve downtown's massive bus congestion and to introduce more efficiency into its six-county public transportation system. The two groups' interests coincided neatly.¹⁷

The transit mall developed with joint funding from transit agencies and the Downtown Denver Business Improvement District's sur-tax dollars.

The mile long transit mall was designed by I.M. Pei as a pedestrian promenade. It is landscaped with planters and street trees, has numerous benches, shelters, fountains, and street lights. The Business Improvement District provides regular sidewalk cleaning and general maintenance. Vendors and outdoor cafes are encouraged. The area is patrolled by a mounted police unit available in part due to contributions by the business improvement district to the police department.

Since the transit mall was completed local merchants believe it has improved sales and increased private investment in the downtown core. The mall was the catalyst for several large mixed use developments; the Tabor Centre runs along a portion of the mall and

includes a 400 room hotel, two office towers and 120,000 square feet of retail space; Market Street Station includes a transit centre and office tower; and the Civic Centre Station includes a transit centre, office tower and retail space.¹⁸ These major development projects have been successful with building occupancy and lease rates both 25% higher than buildings located away from Denver's transit mall.¹⁹

More modest Business Improvement Areas (BIAs) are common in the Lower Mainland. There are seven BIAs in Vancouver, and others in Tsawwassen, Pitt Meadows, New Westminster, and Langley.

Vancouver's Mount Pleasant Business Association was set up in 1985 and has improved the quality of the pedestrian and transit riders' environment by adding floral baskets, bright banners,

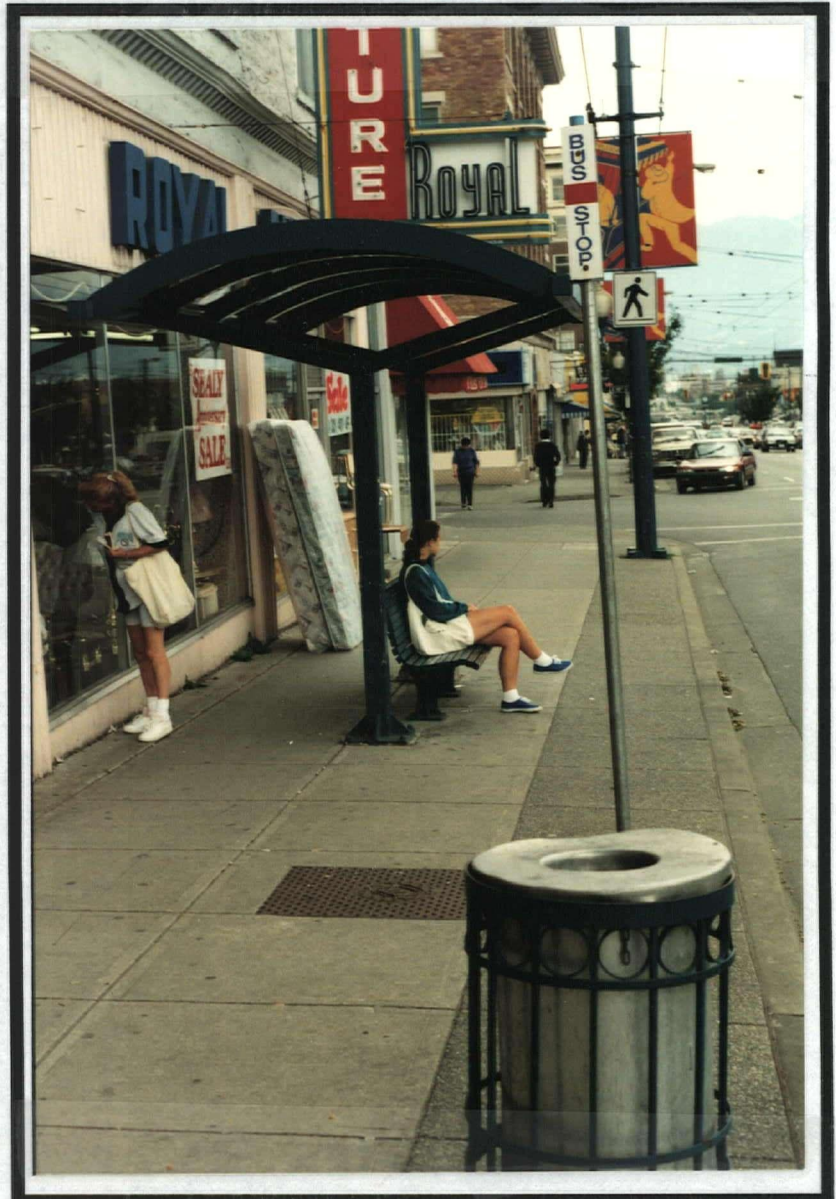


Figure 11.1

Vancouver, Main Street

A municipal bus shelter provided as part of Mount Pleasant's beautification project.

benches, bus shelters, and improved sidewalk paving. The area has adopted teal blue as its colour and the street furniture has been painted accordingly (see Figure 11.1).

Businesses can benefit from taking an active role in improving the environment outside their premises. Improvements to the street and the local transit facilities encourage people to visit an area.

In some instances business who wish to promote their corporate image have designed bus shelters and waiting areas to complement their building. This approach provides for the comfort of the customers and employees and insures that the street furniture outside a building does not detract from the buildings image.

Non-profit organizations have a stake in the community and are often willing to work towards neighbourhood improvements. Rate payers associations commonly use their political clout to increase the provision of municipal services or improve the quality of those services within their own neighbourhoods.

Kinsmen's groups, the Lions Club, the Rotary Club and other private associations participate in community improvement projects. In Gibsons, the Lions Club donated the bus shelter shown and in Lilloet a private group provided the beautifully painted shelter (see Figure 11.2). Within our cities, these groups could participate in street revitalization projects to provide street furniture that is otherwise unavailable.



Figure 11.2 and 11.3
Examples of privately donated bus shelters.



11.6 BC Transit

BC Transit's first goal should be increasing ridership levels. This entails attracting new users, increasing frequency of use among occasional users, and keeping current transit customers.

The population of the Greater Vancouver Regional District grew by 21% and travel, the number of trips made in the peak period, grew by 37% from 1985 to 1992.²⁰ Despite these strong growth rates transit ridership levels decreased from 129 million passengers in 1992-93 to 126 million passengers in 1993-94.²¹

BC Transit must change in order to gain ground and become a more effective supplier of transportation in the GVRD. BC Transit must provide a transit system that can adapt to local changes and regional growth patterns.

BC Transit must follow its customers and develop routes where the people are. Recently growth rates have been highest in the suburbs but BC Transit has not followed the trend and transit service has not kept up with suburban demand.²²

BC Transit must be competitive and provide quality service and surroundings. Comfort and convenience are necessary in order to compete with the luxury of the private car.

Even those users who are captive to transit have choices in the long run - to acquire an automobile, to move, to change travel patterns, or not to travel. In order to ensure long term viability, transit facilities should be designed to provide a quality environment that is competitive to the automobile.²³

BC Transit must meet the needs of the customers. Transit riders want safe, comfortable, accessible and convenient transit. Improving the designs of transit facilities and the pedestrian areas leading to transit facilities must become part of BC Transit's mandate.

In order to improve the quality of the service and the facilities used by transit customers BC Transit must take responsibility for promoting transit and educating public officials and private groups.

BC Transit can continue to pursue their marketing strategy to promote public awareness of the transit system. Particular efforts should be made to promote the transit system to local governments and their staff, and to business groups and associations.

Promotional campaigns can include publications, advertising, seminars and the distribution of free tickets. Giving transit tickets to municipal governments for their staff to use during work hours will increase the number of municipal officials who are familiar with the transit system. Once people use transit they start to become aware of the problems associated with transit use, and see methods of improving it. Getting municipal officials familiar with both the strengths and the weaknesses of the system is an important step in getting municipalities to start planning for transit.

Discussions with local municipal planners and engineers illustrated that many professionals were unfamiliar with the transit system or with levels of transit ridership. Statements like, "the transit system works ok," or "we've had public transit here for awhile

and it doesn't need changing," were common reflections of the lack of interest and understanding that municipal officials have for transit.

BC Transit can provide resource staff to help with planning and designing municipal projects. BC Transit planners can participate in long range planning discussions to ensure that public transportation is not overlooked.

BC Transit already provides a limited referral service to municipalities and local consultants working on major projects. This service should be expanded to include a review of all projects that are located on transit routes or at transit stations. Alternatively, BC Transit should provide assistance and training to municipal staff to review the projects in-house, to ensure transit objectives are not overlooked.

Finally, BC Transit must take an active role in coordinating efforts by the different agencies and departments responsible for the quality of transit facilities and the streets they are located on. A transit liaison planner could coordinate efforts between municipal departments (engineering, public works, planning), private organizations (BIAs and rate payers associations), and private development to ensure that the best amenities possible are provided.

11.7 Conclusion

Local governments, private enterprise, and non-profit associations can support public transit and benefit from it.

Cooperation between the agencies and groups involved is necessary to maximize the quality of service available to transit customers and improve the transit trip.

The Greater Vancouver Regional District provides a forum for discussion among the municipalities and transportation agencies. This role should be expanded to encourage and coordinate regional cooperation in order to promote transportation and land use planning that supports public transit.

BC Transit must provide expertise and support to these different organizations. BC Transit staff must facilitate the small scale cooperation between municipal departments and local organizations that improves the individual transit facilities and streetscapes and adds to the comfort and convenience of the transit trip.

Chapter 11 Endnotes

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12.0 CONCLUSIONS AND RECOMMENDATIONS

12.1 Conclusions

This thesis demonstrates that many people share my concern over the quality of the transit trip. In surveys and interviews, transit riders and non-riders expressed concerns about safety, comfort, information, accessibility and boredom.

Public concern and customer dissatisfaction is high, and causes people to avoid using transit. It follows that remedying these problems will increase customer satisfaction and may lead to conservative increases in ridership.

No studies have been done that quantify an improvement in design with an increase in ridership, though the surveys and transportation literature both suggest that increases in ridership are likely.

The Report of the BC Transit Safer City Task Force Committee suggested that even a .113% increase in ridership due to safety and security improvements would completely offset the annual cost of those improvements by contributing \$152,250 in additional revenue.¹

Modest increases in ridership are sufficient to offset many of the costs associated with transit improvements and to provide incentive for BC Transit to pursue these

improvements.

The thesis findings show that planning and design can address most of the concerns raised about the quality of the transit trip. Planning can support and encourage transit use, add comfort and convenience to the transit user, and facilitate pedestrian access to transit.

To implement a significant change in transit facility design a change in attitude is required by BC Transit staff and municipal governments.

BC Transit must plan and design its facilities with the customer in mind. Currently designs accommodate customers but do not encourage them. The transit industry must realize that transit riders are customers with other options. Accordingly, greater emphasis should be placed on planning for transit riders. Thought must be given to what transit riders experience as they arrive and wait at a transit facility.

This shift towards the customers' needs can be applied equally to local bus stops and major transit centres. The key issue is to always try to improve the surroundings of the customer so that their transit trip is improved.

Municipal governments must also undergo a change in attitude; they must act to support transit use in their communities. Already municipal governments have adopted policies that recommend supporting alternative methods of transportation but these policies have

not led to change.

Municipal planners in the Vancouver region agree that public transit is important and should be encouraged. However, there are almost no examples of municipalities planning for transit, encouraging transit use, or improving transit facilities.

Municipalities can make a significant difference in the quality of the transit trip. City streets and transit facilities are their responsibility. Improving them requires municipal governments give greater consideration to the people who use streets and transit. Municipalities must take action to support transit use and encourage pedestrian transportation.

12.2 Recommendations

Recommendations for improvements to the transit facilities are listed in Table 12.1. The list summarizes the recommendations in the order they appear in the thesis. Following each entry is a comment on the organization that would be able to implement the recommendation. Each entry ends with a note as to the ease with which the recommendation may be implemented; easily, moderately, or with difficulty.

The majority of recommendations listed require a small effort by BC Transit or local

governments. These recommendations do not require significant changes to staff, budgets or administration and, therefore, can be easily implemented.

For example, more attention may be paid to the impact of land use on transit if in each land use report to Council an entry is included on the relationship between the proposal and the transit system. This proposal would require no additional staff, no additional cost, and would not take much time or effort.

Other recommendations are rated as moderately difficult. These recommendations are ones that require cooperation between agencies or political support. In most cases the increased effort required for implementation is worthwhile as the recommendation has greater potential to improve transit facilities.

For example, municipal governments could adopt pro-transit land use strategies like transit overlay zones that would ensure favourable development along transit corridors or at transit centres. In order achieve this, planning and legal departments and BC Transit would need to work together to formulate the appropriate plan and by-laws. The by-laws would then require approval by Council. This recommendation has a far greater impact than most of the "easy" recommendations but requires more work and the support of more people.

Finally, there are those recommendations that are rated "difficult." These are recommendations that have the most potential to improve transit facilities in the Vancouver

region but also are the most difficult to implement and, accordingly, the least likely to be implemented.

An example of a "difficult" recommendation is the proposal for the provincial government to legislate municipalities to produce land use and transportation plans that encourage transit and pedestrian use. Such legislation would ensure that all municipalities worked on pro-transit plans. This proposal would require the support of provincial politicians who are not interested in Vancouver's regional transportation issues and do not consider it an important issue. Furthermore, the proposal would be opposed by local governments who would see it as an infringement of their authority. It is therefore unlikely that this proposal would ever be realized.

Table 12.1
Summary of Recommendations for Improving Transit Facilities

Purpose	Recommendation	Institution and Method of Implementation	Ease of Implementation
Crime & Safety	Use CPTED principles when designing transit facilities	BC Transit Policy	easy
Crime & Safety	Conduct regular safety audits of transit facilities	BC Transit Staff -Team of staff and volunteers to conduct audits and implement renovations	easy
Crime & Safety	Increase official surveillance of transit facilities	BC Transit Staff -Increase security staff	easy
Crime & Safety	Increase awareness of existing security measures	BC Transit Promotion	easy
Crime & Safety	Increase unofficial surveillance through improved adjacent land use and design	BC Transit & Municipal Governments Policy	moderate
Crime & Safety	Increase collaboration between BC Transit and local police forces	BC Transit & Local Police Forces Policy / Administration	moderate
Comfort	Coordinate efforts to provide better transit stops	BC Transit Staff -Liaison with various agencies	moderate
Comfort	Establish municipal bus stop programs to provide shelters, lighting, etc.	Municipal Governments Staff	moderate
Information	Provide information at transit facilities	BC Transit Administration	easy
Access	Design accessible transit facilities	BC Transit Policy Policy	easy

Access	Design and construct streets to be accessible	Municipal Governments Policy / Administration	easy
Land Use	Include discussion of transit in Official Community Plans and other land use documents	Municipal Governments Policy	easy
Land Use	Adopt pro-transit land use strategies like transit overlay zones	Municipal Governments Policy / Administration	moderate
Land Use	Promote referral service	BC Transit Policy	easy
Land Use	Refer land use plans and projects to BC Transit for comment	Municipal Governments	easy
Land Use	Provide legislative authority to BC Transit to require referral (similar to the Ministry of Environment)	Province Legislation	difficult
Land Use	Include analysis of the impact on transit in reports to Council on land use	Municipal Governments Policy / Administration	easy
Land Use	Councillors should support pro-transit land use planning	Municipal Governments Councillors	difficult
Land Use	Establish team to work with municipalities to promote pro-transit land use planning	BC Transit Staff	easy
Urban Design	Include transit in review of road layouts	Municipal Governments Administration	easy
Urban Design	Include transit in design discussions (Advisory Design Panel, and Development Permits)	Municipal Government Policy	easy
Urban Design	Improve road standards to encourage pedestrian and bicycle use	Municipal Governments Policy Requiring Council approval	moderate
Urban Design	Revise zoning provisions to reduce setbacks and encourage pedestrian circulation	Municipal Governments Policy Requiring Council approval	moderate

Urban Design	Broaden assessment of how customers arrive at transit facilities	BC Transit Design	easy
Urban Design	Broaden scope of use of transit facilities, explore additional uses	BC Transit Design	moderate
On-Site Design	Coordinate street furniture	Municipal Governments Staff / Administration	moderate
On-Site Design	Adopt a % for art program to fund public art	Municipal Governments Policy Requiring Council Approval	moderate
On-Site Design	Promote transit facilities as galleries for art displays	Arts Organizations & BC Transit Administration	moderate
Land Use	Adopt legislation requiring local governments to plan for transit	Province Legislate Change	difficult
Land Use	Adopt policies to encourage all provincial agencies to locate facilities (where appropriate) at or near transit	Province Policy / Administration	moderate
Land Use	Adopt legislation that gives the GVRD the mandate to coordinate a regional land use and transportation plan	Province Legislate Change	difficult
Land Use	Lobby for the power to enact a regional land use and transportation plan	GVRD Lobbying the province	moderate
Education	Continue to act as a forum for discussion of regional transportation and land use	GVRD	easy

Chapter 12.0 Endnotes

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Appendix 1: The Survey

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APPENDIX ONE

SURVEY OF PLANNING STUDENTS

A.1 Introduction

In the spring of 1993, I surveyed graduate students and their opinions about transit service and the quality of transit facilities. My aim was to obtain information that could help me decide whether or not this subject merited further investigation.

The survey was designed to gauge the degree to which transit riders felt there were inadequacies with the existing transit facilities.

Forty students completed the questionnaires and returned them to me.

The survey results provide an interesting insight into transit use, and the survey participants' perception of transit.

Where possible, the results were quantified. For example, in Question Number Six, 14 people (35%) said "NO" and 26 people (65%) said "Yes" when asked whether or not they feel safe while waiting for public transit.

The survey results included general comments and recommendations. Some of these comments were grouped or quantified. For example, in Question Number Six, 10 people

out of the 14 who answered "No" (or 71%) felt that more light was required at transit stops and stations.

The conviction and feeling behind the comments, combined with many unique perspectives, made it worthwhile including quotes from the completed surveys. These are included under the heading: "Additional Comments." These quotes illustrate the strength of the sentiment and the diversity of thoughts on each subject.

A.2 The Results

Question One:

1. Please indicate your gender: ☐ male ☐ female

Results: 18 male 22 female

Question Two:

2. How often do you use public transit:

Results:

2 never (zero)
2 hardly ever (less than 1 time/year)
9 from time to time (1-11 times/year)
7 sometimes (1-3 times/month)
5 often (1-2 times/week)
15 all the time (3 or more times/week)

Question Three:

3. Please indicate the facilities you use when travelling by public transit, and the frequency with which you use them.

Results:

37 people use bus stops - on average 16 times per month
24 people use bus loops - on average 12 times per month
19 people use SkyTrain stations - on average 1 time per month
11 people use SeaBus stations - on average 1 time per month

Question Four:

4. How often do you travel by public transit:

34 travel within Vancouver on average 18 times per month .

** ☐ within your home municipality _____per month

13 travel across a municipal boundary on average 4 times per month

11 travel across more than one municipal boundary 3 per month

** this survey question was poorly phrased and the results from it are not valid.

Question Five:

5. Please take a moment to think about the transit facilities you are familiar with. List the good things that come to mind when thinking about: bus stops, bus loops, SkyTrain stations, and SeaBus stations.

List the bad things that come to mind when thinking about:
bus stops, bus loops, SkyTrain and SeaBus stations.

Results:

General:

The comments participants made about the things they liked parallel the comments about things they didn't like. For example, most people who said they like shelter from the rain at the bus stop also said that not enough bus stops provided shelter.

Number of Comments:

Forty people filled out this survey, but not every person commented on each of the eight possible topics (positive and negative comments on bus stops, bus loops, SkyTrain stations and SeaBus stations). A quick glance at the long list of comments about bus stops compared with the relatively short list of comments about SkyTrain might suggest that one is better, or more well liked than the other. This may be true, but it also reflects the survey groups' familiarity with the various services. For this reason the number of comments that were made regarding each topic are included.

BUS STOPS

Number of Comments:

32 People made positive comments about Bus Stops.

39 People made negative comments about Bus Stops.

What People LIKE at Bus Stops:

18 people said that they like **bus shelters**.

9 people said they like **benches**.

7 people said they like the **frequent location of bus stops**, ie bus stops every 2 blocks.

4 people commented on location:

"well lit locations"

"visible to traffic and other people"

"Located on a busy road is better for safety at night."

"near shops and cafes"

4 people commented on amenities:

"things to read and look at"

"pay phone and schedules"

"newspaper box, trash can, and mailbox"

"newspaper box"

and 2 people commented on people:

"met some of my best friends this way"

"chatty sort of place, solidarity"

What People DON'T Like at Bus Stops

26 people want some or better shelter from the wind, rain and in one case, sun.

9 people want places to sit (dry benches are preferred)

9 people want better lighting at the bus stops

8 people want schedule information

5 people want garbage cans

5 people note the level of vandalism

3 people note the dirtiness of the bus stops

3 people note the isolation of the bus stops

2 people note getting splashed while waiting for the bus

2 people find the stops inconveniently located

Highlights:

"unsafe at night eg. University Blvd. stop, an isolated spot.)

"COLD, DARK and WET."

"Sometimes dark and isolated at night, although lights might make your presence more obvious thus leaving you more vulnerable. No schedule, so you don't know when exactly the bus will arrive. Knowing this information could be helpful if you wanted to go somewhere sheltered or perhaps safer until a few moments before the bus was to arrive."

"I've cried at bus stops before, having to wait over half an hour for a bus at night in the bitter cold, only to have it whisk by me without stopping because it was already full. Having to wait another half hour for the next bus under those conditions is enough to make almost anyone want to buy a car as soon as they could afford it."

"Standing at a bus stop leaves you vulnerable to harassment by panhandlers and drunks - I speak from experience. Walking away is not an option because you might miss your bus."

"nothing to do but watch traffic, waiting..."

"traffic noise and smell"

"noise from traffic"

"very exposed to wind and rain (not very comfortable to wait at) too close to road (people get splashed when buses, trucks, and cars go by...)"

"Usually no bus schedule or route or even destinations are posted, which discourages the use of new comers or travellers."

BUS LOOPS

Number of Comments:

24 People made positive comments about Bus Loops.

22 People made negative comments about Bus Loops.

What People **LIKE** at Bus Loops:

7 people said they like the bus shelters.
6 people said they like having bus schedules posted.
6 people said they like the convenience of bus loops:
4 people said they like the lighting at bus loops.

Highlights:

"generally good, especially at UBC"

"UBC bus loop (provides) good shelter to protect from sun or rain, close to UBC SUB and bookstore, which is convenient in case of long waits."

"provide reasonably convenient transfer points"

"good connections"

What People **DON'T Like at Bus Loops:**

6 people find bus loops too isolated
5 people find bus loops ugly:
 "concrete wastelands"
 "no landscaping, overly concrete."
4 people notice the lack of services and amenities
3 people want better shelters
2 people find bus loops dirty:
4 people comment on people:
 "overcrowding"
 "creepy people that sit next to while waiting"

Highlights:

"confusing"

"located in more isolated areas, poorer lighting, no patrols."

"barren, deserted, isolated from services and surrounding streets."

"Transit exchange at Richmond Centre (not a true loop) is too spread out - sometimes have to run from one bus bay to another."

"Bus loop at Ladner Exchange needs more seating (covered nearer to the bus bays. It is also very isolated - no stores nearby etc."

"crime gangs - North Shore"

"windy"

"not well lit, isolated, often deserted at night, don't give transit patrons feeling of safety"

"no facilities or service that might reduce tediousness of waiting"

"I avoid them (bus loops) if possible"

Several people commented on BC Transit policy:

"people not allowed into buses unless driver is there and he wants to let people on (unlike in Toronto, where people are allowed to board driverless buses at stations)."

"Bus should open doors and allow people in as soon as it gets to the bus loop, rather than letting them wait outside."

SKYTRAIN STATIONS

Number of Comments:

16 People made positive comments about SkyTrain stations.

17 People made negative comments about SkyTrain stations.

What People LIKE at SkyTrain Stations:

- 5 people find the SkyTrain stations clean
- 5 people like the shops/concession stands
- 3 people like the shelter
- 2 people find them bright and colourful
- 2 people like the transit information

Highlights:

"can use vending machines to buy ticket - don't need exact change."

"clean, safe, integration with other modes"

"spacious, well designed"

"some with smoke shops and convenience stores."

"music at New Westminster Station"

"light, airy, views, safe"

"dry, covered, clean"

"modern, convenient, good service"

"usually clean and efficient"

"clean, bright, colourful"

What People DON'T Like at SkyTrain Stations:

5 people don't like the design of SkyTrain stations

4 people find them "sterile" environments

4 people want washrooms in the stations

3 people want more seating

3 people see crime as a potential problem

2 people want escalators

Highlights:

"too big"

"absolutely amazed that there were no washrooms at the Scott Rd. Station. (because a person arriving there is very likely in the middle of a fairly lengthy transit - and might need to relieve themselves at that point in their journey)."

"ugly"

"cold, stark"

"antiseptic design"

"feeling of isolation when waiting on the platform; feeling of vulnerability to attack"

"can be dangerous - groups of kids hang out"

"no life, no buskers"

"sterile, could use more seats or wall paintings"

"indirect access (have to up or down several flights of stairs)"

SEABUS STATIONS

Number of Comments:

13 people made positive comments about SeaBus Stations.

6 people made negative comments about SeaBus Stations.

What People LIKE at SeaBus Stations:

Four people like the handy shops, cafes, and market area:

"the market is good."

"shops, coffee, station activity"

"food, and shops"

Three people like the re-use of the old train station.

"love the "feel" of the old CN building - real character"

"well located, like the atmosphere of the old train station down town."

Two people like the phone booths

Two people like the waterfront views

Two people like the feeling of safety:

"Attended by staff, this helps one feel safe, well lit, sheltered, pay phones.

SeaBus has it all! - including time of departures"

Additional Comments:

"Provides info. on the transit system."

"large"

"some seats provided, washroom available (although often filthy and uncared for), inside waiting area (warm in winter)"

"more safe, patrolled, phones nearby"

"dry, and covered, and clean"

"The Musicians, in particular the man who plays the — (oriental instrument of some sort); I think there is tiling (that I like) on the wall or something; the view from the walkway (view of Panpacific, of Coal Harbour, of the mountains); going through the old railway station."

"very efficient, handles high volumes" [of people]

"ease of access"

What people DON'T Like at SeaBus Stations:

Four people note the distance to the dock at the southern terminal in Vancouver:

"The long, long walks, when you're tired of walking (but this isn't really a big complaint)"

"indirect access on Vancouver side (it would have been nice for the less "able-bodied" not to have to walk down the long hallway)"

"walk is too long, ugly."

"distance to walk"

Additional Comments:

"no bikes allowed"

"limited locations"

"Very cold" [spiritually not literally]

Question Six:

6. **Safety:** When you are waiting at a transit facility, do you feel safe?

☐ Yes

☐ No

If "No," what would recommend to improve the passenger safety at the facility?

Results:

26 People said "YES," they feel safe.

14 People said "NO," they don't feel safe.

Of the 26 people who said "YES" 8 qualified their choice with the following comments:

Two qualified their response, saying it depended on the transit user's sex, age, size, strength:

"I feel safe, but I don't feel my sisters are safe."

"I generally feel pretty safe but the poorly lit conditions would make me very nervous if I were a woman..."

Three people qualified their response, saying it depended on the time of day:

"I don't travel after dark, but during the daylight hours I feel safe."

"YES, except late at night"

"depends on the time of day"

Four people qualified their answer, saying it depended on the location or area:

"...also Granville Street needs revitalization and social problems need to be addressed if people are to feel comfortable waiting at stops on Granville."

"Generally, but depends exactly where one is waiting for a bus..."

"At night I feel safer at bus stops than bus loops which tend to be in out of the way places (UBC, Dunbar loop,)"

"However I didn't feel safe when I used the Kootany Loop - don't know if it has improved."

"In urban areas, safety in general is of growing concern. Transit, I think, needs to make it [safety] a "higher" priority than I currently perceive it to be."

Of the 14 people who said "NO" the following recommendations were made:

- 10 people think improved lighting will help increase safety (or their perception of safety).**
- 7 people want public telephones nearby.**
- 3 people want patrol by police, security guards or transit personnel.**
- 3 people want an increase activities like cafes and 24 hour corner stores.**
- 3 people want emergency buttons, and tv surveillance.**
- 2 people schedules posted so they can wait in safety elsewhere.**
- 2 people want more safety conscious designs.**

Additional Comments:

"All night cafes - or at least services on the premises that are open while buses are running (5:30am to 2:00am). Just so you know help/someone is nearby."

"lighting, rounded shelter - ie no corners, no sexist posters, police phone number on poster, phone booth nearby, bright friendly colours, safety buzzer at bus loop (like in Toronto subways)."

"phones by stop, well lit, schedules present, cafe near by."

Question Seven:

- 7. Shelter:** Do the transit facilities you use provide adequate shelter from the weather?

☐ Yes

☐ No

If "No," what would you recommend to improve the shelter at the facilities you use?

Results:

17 People said "YES" they had adequate shelter from the weather.

23 People said "NO" they did not have adequate shelter.

YES:

Of the 17 people who said "YES," 6 qualified it with the following statements: "sometimes," "overall," "most of the time," "some" "except local bus stops."

NO:

The following recommendations were suggested to improve the shelter at bus stops and stations:

17 people want improvements to BUS SHELTERS including:

- 11 people want bigger or better bus shelters.
- 4 people want more bus shelters.
- 2 people want vandalism repaired at bus shelters.

7 people want awnings, roofs, overhangs and other types of shelter provided (not including bus shelters).

- 3 people want roofs.
- 4 people want more or better awnings (in front of private buildings).

4 people want shelters that protect the benches from rain too.

Question Eight:

8. Lighting: Are the transit facilities you use well lit?

☐ Yes

☐ No

Comments: _____

Results:

14 People said "YES" transit stops and stations are well lit.

18 People said "NO" transit stops and stations need more light.

8 People did not answer.

No Answer:

Of the eight people who chose not to answer this question several included comments like: "I don't use transit after dark," "travelling at night is kept to a minimum," and "I drive at night."

YES:

Of the fourteen people who said "YES," four added that they used transit stops in busy areas or well lit streets:

"but they are usually in busy places already."

"generally I only take the bus on well lit streets."

NO:

These additional comments were made:

"I think poor street lighting is a widespread problem in this city, but it is especially noticeable at bus stops."

"Bus stops are particularly bad, but many bus loops are also inadequately lit - it would be nice to have enough light so that one could read while waiting for buses at night (when service is also more infrequent, longer waits). Perhaps, locating bus stops near street lamps could minimize the expense of improving lighting."

[Are the transit facilities you use well lit?] "Not always, but I feel safe anyway."

"Could use mini-lights."

Question Nine:

9. **Information:** When you use transit, can you find:

Schedules ☐ Yes ☐ No

Maps ☐ Yes ☐ No

The price of fares ☐ Yes ☐ No

What additional information services would like to see provided by BC Transit?

Schedules:

14 People said "YES" they can find schedules.

22 People said "NO" they can't find schedules.

4 people did not answer this question.

Maps:

18 People said "YES" they can find maps.

17 People said "NO" they can't find maps.

5 people did not answer this question.

Price of Fares:

21 People said "YES" they can find fare information.

18 People said "NO" they can't find fare information.

1 Person didn't answer this question.

Comments additional information services that people would like to see provided by BC Transit:

12 People want more access to schedule information including:

"Schedules could be more easily acquired....are they at public libraries? Or in close proximity to all bus loops?"

"In Calgary, each bus stop has a phone # attached to it. You can call "tele-ride" to find out when your bus is coming to your particular stop. Each bus stop pole has the relevant phone # attached to it and any delays are recorded on a message. This service is very popular."

"How many minutes to wait for the next bus."

"Thirty seconds before the next bus arrives, the speaker at the stop say: "Bus #10 to UBC is arriving in 30 seconds, Thank you for your patience." This allows us to read books while waiting, without being worried."

"Little credit card schedules that would fit in a wallet."

"Post schedules and maps on the back wall of bus shelters or on signs above."

3 People want a better phone service:

"The info number (261-5100) should work even after 11:30pm. What if one needs to know times of departures or arrivals late at night?"

"Express phone to B.C.Transit"

"Phone number for complaints."

"Phone lines you can get through to."

3 People want additional information at transit stops and stations:

[Schedules, maps and the fares] "This information should be provided in each shelter."

"Maps to show where you are. In Quebec two transit companies use maps of the immediate neighbourhood to give you your bearings."

"List the price of fares on the bus stop."

Additional Comments:

"Free system map as in Toronto."

"Access information for people with disabilities - Graphics versus Text information."

"I think they do a good job - the information line is very good. Could Transit be more of a "hub" for people forming car pools, and ling with transit, etc.?"

Question Ten:

10. **Accessibility:** Are the transit facilities you use easily accessible for handicapped individuals, older individuals, or people with baby carriages?

☐ Yes

☐ No

Comments: _____

8 People said "YES" transit facilities were accessible.

26 People said "NO" transit facilities were not accessible.

6 People did not answer, or said they did not know whether or not transit was accessible.

Additional Comments:

Seven comments relate to buses and bus drivers:

"The Broadway routes (#10, #9) never/rarely have wheel-chair accessible buses. People get on and off with baby carriages only at the good graces of the bus driver or other passengers. For older people, the bus steps are very high. But this doesn't relate to the facilities. If there were appropriate buses, all of these people could access the bus from the stops I use."

"I pity older people and those with carriages because the buses often start before those individuals can seat themselves. I've seen a woman in her eighties go sliding down an aisle as a result of a sudden start."

"Doors [on buses] are narrow. Some bus drivers are patient, but not all. Steps seem high to step up to for seniors and little kids. A ledge at the front of the bus would help those who do not have money ready."

"Rude bus drivers can make access problems greater. eg. refusal to lower steps, quick starts and stops..."

"Some buses are now equipped with lift operated services and of course there is courtesy seating at the front of the bus for the elderly so I feel this issue is well on the way to being resolved. Bus drivers always seem willing to help parents with baby carriages."

"Need more lifts and bike access"

"Wheelchair access is sporadic and time consuming, steps on buses are too high from curb for some people, no space for baby carriages."

Three comments relate specifically to Baby Carriages:

"Baby carriages seem to have the hardest time - mothers (or fathers) have to struggle to fold the carriage and carry kid and stuff - bus drivers don't seem very helpful. Why do the carriages have to be folded? Or do they?"

"Carriages are placed in an awkward space in buses."

[Are transit facilities accessible?] "Yes, except for SkyTrain - try pushing a double stroller up an escalator!"

Three comments relate to SkyTrain:

"Granville station has poor access."

"Stairs are a problem as I have bad knees."

Additional Comments:

"No buses for the handicapped."

"Need a ramp on the sidewalk, no benches, no shelter."

Question Eleven:

11. **Comfort:** Are there adequate benches provided at:

The SeaBus Station (you use most)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The SkyTrain Station (you use most)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The Bus Loop (you use most)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
The Bus Stop (you use most)	<input type="checkbox"/> Yes	<input type="checkbox"/> No

What would you recommend to improve the seating that is provided by BC Transit?

SeaBus:

13 People said "YES" there is adequate seating.

1 Person said "NO" there is not adequate seating.

26 People didn't answer.

SkyTrain Stations:

11 People said "YES" there is adequate seating.

7 People said "NO" there is not adequate seating.

12 People didn't answer.

Bus Loops:

17 People said "YES" there is adequate seating.

8 People said "NO" there is not adequate seating.

12 People didn't answer.

Bus Stops:

18 People said "YES" there is adequate seating.

17 People said "NO" there is not adequate seating.

5 People didn't answer.

Additional Comments:

8 People want more seats.

5 People want improved maintenance of the existing seating:

"Benches are not clean. BC Transit should clean them at least once in two weeks or more."

"Some need fixing - loose wood."

"The benches get wet because the glass is broken and not repaired."

2 People want protection from the rain while seated:

"Put a roof over the benches so that they don't get wet when its raining."

2 People want more better locations for the seating:

"Make it closer to the stop. In Coquitlam, many benches are several feet from the stop (weird)! And somehow, they've got to be made tougher - too many get vandalized."

"Many of the benches seem to be placed right at the curb, so you have the traffic zooming by just 2-3 feet from where you're sitting (especially on Burrard Street) - can't benches be moved back to buildings?"

2 People want more comfortable seats:

"The benches could be a little more comfortable. The benches are often a little flimsy, and the seat part is not deep enough."

Additional Comments:

"If transit can't afford to provide benches can they get advertisers to provide them? (ie advertisers provide bench in exchange for free advertising on that bench.)"

Questions Twelve to Fourteen:

Based on your experience with public transit systems here and in other cities:

Question Twelve:

12. Do you feel that the design of transit stations makes a noticeable difference to the quality of your trip?

17 a big difference

15 some difference

8 no difference

Question Thirteen:

13. What good examples of transit facility design have you seen? (Please state where you have seen them.)

Examples include:

- Calgary - telephone info service.
- DisneyWorld - LRT
- Halifax - info. service.
- Hong Kong - Star Ferry
- Mexico City - Signs understandable by all (non literate)
 - Mexico's underground
 - art, and archeology!
- Montreal's Metro -art displays, public library McGill Station
- Munich (Germany) - electronic signs showing schedule info.
 - U-bahn stations.
- New Orleans - St. Charles Streetcar.
- New York - Subway.
- Ottawa
 - enclosed shelters on Rideau Street
 - four sided shelters
 - physical design theme
 - tv monitors showing schedule
 - at grade busway
- Tokyo's Buses - the automatic schedule announcements.
- Toronto's TTC
 - Subway Vending machines, newspaper stands...
 - Subways designated waiting areas.
 - mirrors - able to see around the corner
 - subway - bus integration
 - Union Station - GO train, Trolley, Subway and Bus.
- Seattle - artwork in bus stations.
- Seoul, Korea -Subway
- Sherbrook, QC -"The best Transit City in Canada"

- signage, and schedules.

Vancouver:

- Royal Sealink.
- Via Rail Stations
- Greyhound Bus Station (Main and Terminal)
- **some** of the bus shelters
- the underground SkyTrain stations
- southbound stop, Granville and Georgia

Question Fourteen:

14. What **bad** examples of transit facility design have you seen? (Please state where you have seen them.)

- Bankok - public buses
- Boston - Train Stations and Trains
- dangerous and derelict
- Calgary - no timed connections, infrequent service
- Jakarta - public buses
- Lima - public buses
- London - Underground stations that are too deep.
- long dimly lit pedestrian tunnels, with blind corners
- Milan - overcrowding
- Nanaimo -
- New York - dangerous and derelict
- Richmond - Suburbs, infrequent service.
- Rome - overcrowding, no schedules
- Saskatoon - no shelters, no benches
- Seattle - bus tunnel
- not enough benches
- St. John's- no signage
- Spokane - Greyhound Station - grungy.
- Vancouver - Granville Station - too deep
- no mirrors, no visibility
- Southlands Busloop (Dunbar and West 41st.)
- Marpole Bus Loop
- Coquitlam loop (ugly, machine not people oriented)
- Kootenay loop (ugly, no benches, scary people)
- UBC loop
- lack of originality or variety
- park and ride stations
- Burrard southbound at Georgia
- Vandalism - too much and it isn't repaired.
- Victoria
- Waterloo - lack of sidewalks when one disembarks

ADDITIONAL COMMENTS

Design:

- More bike racks and lockers for bike and ride.
- Increased visibility at UBC bus loop.
- Safety issues should be the key factor in facility design.
- Schedules are important - more should be provided.
- Jazz up the bus stops.
- Let people flag down buses at intersections in the suburbs.
- Install change machines on buses.
- Cleanliness induces respect and even feelings of safety, garbage cans would be good.
- "The bus shelters should be fitted to suit the climatic conditions and safety needs of users. Each bus stop may provide slightly different shelter requirements and services and this should be considered when designing and building each particular bus stop."

General:

- Transit should be free.
- More buses.
- Improve bus drivers' manners.
- Get more park and ride facilities.
- Need SkyTrain to UBC.
- Need bike lanes.
- Friendly drivers would be good.
- Expand SkyTrain (UBC, Richmond, Maple Ridge, and Langley)

"I guess if the facilities for waiting are nice, then it doesn't make waiting so bad."

APPENDIX TWO

TRANSIT OVERLAY ZONES

A.1 Introduction

This appendix includes transit overlay zones from the City of Portland and from the County of Washington.

Both examples were prepared with assistance from Tri-Met transit system in conjunction with the planning and development of Tri-Met's light rail line.

The intent of the transit overlay zone is to encourage transit supportive land use at and around transit stations. The strategy used to encourage transit use is threefold:

- a) prohibit land uses that are automobile dependent;
- b) encourage land use densification by establishing minimum densities and floor area ratios;
- c) set maximum parking requirements so that businesses rely more heavily on pedestrian, bicycle and transit use.

Portland's transit overlay zone applies to an urban area in which the underlying zoning regulations already encourage high density and pedestrian friendly design.

Washington County is a suburban jurisdiction. The underlying zones in Washington

County are automobile orientated and therefore the transit overlay zone is more rigorous, requiring more significant differences in land use and design in order to support transit.

Washington County is working on station plans and has adopted the transit overlay zone as an interim measure until such time as the station plans are complete. (Washington County estimates that the station plans will take another two years to finalize.)

A.2 City of Portland's Transit Overlay Zone

CHAPTER 33.450 LIGHT RAIL TRANSIT STATION ZONE (Amended by Ord. No. 167464, effective 4/15/94.)

Sections:

General

- 33.450.010 Purpose
- 33.450.020 Short Name and Map Symbol
- 33.450.030 Where These Regulations Apply

East of the Willamette River

Use Regulations

- 33.450.100 Commercial Parking Facilities
- 33.450.110 Vehicle Repair, Quick Vehicle Servicing, and Retail Sales And Service

Development Regulations

- 33.450.200 Housing Regulations
- 33.450.205 Minimum Floor Area Ratio
- 33.450.210 Park-And-Ride Facilities
- 33.450.215 Building Setbacks From Streets
- 33.450.220 Ground Floor Windows
- 33.450.225 Improvements Between Buildings and the Street
- 33.450.230 Parking Between Buildings and the Street
- 33.450.235 Maximum Number of Parking Spaces
- 33.450.240 Exterior Display, Storage, and Activities
- 33.450.245 Gates
- 33.450.250 Office of Transportation Requirements

West of the Willamette River

Use Regulations

- 33.450.300 Prohibited Uses

Development Regulations

- 33.450.400 Prohibited Development
- 33.450.410 Minimum Floor Area Ratio
- 33.450.420 Minimum and Maximum Parking Requirements
- 33.450.430 Location of Vehicle Access
- 33.450.440 Improvements Between Buildings and the Street
- 33.450.450 Ground Floor Windows

General

33.450.010 Purpose

The Light Rail Transit Station overlay zone encourages a mixture of residential, commercial, and employment opportunities within identified light rail station areas. The zone allows for a more intense and efficient use of land at increased densities for the mutual re-enforcement of public investments and private development. Uses and development are regulated to create a more intense built-up environment, oriented to pedestrians, and ensuring a density and intensity that is transit supportive. The development standards of the zone also are designed to encourage a safe and pleasant pedestrian environment near transit stations by encouraging an intensive area of shops and activities, by encouraging amenities such as benches, kiosks, and outdoor cafes, and by limiting conflicts between vehicles and pedestrians.

The regulations for the West Side are temporary; they will be revised at the completion of a regional effort to develop station area plans.

33.450.020 Short Name and Map Symbol

The Light Rail Transit Station zone is also referred to as the LRT zone, and is shown on the Official Zoning Maps with a "t" map symbol.

33.450.030 Where These Regulations Apply

The regulations of this chapter apply to the LRT zone. Regulations in Section 33.450.100 through 33.450.250 apply to uses and development in the LRT zone east of the Willamette River. Regulations in Section 33.450.300 through 33.450.450 apply to uses and development in the LRT zone west of the Willamette River. The LRT zone may be applied to station areas along new light rail transit lines in the future.

EAST OF THE WILLAMETTE RIVER

Use Regulations

33.450.100 Commercial Parking Facilities

Commercial Parking Facilities are prohibited in the LRT zone.

33.450.110 Vehicle Repair, Quick Vehicle Servicing, and Retail Sales And Service

All of the following are prohibited within 300 feet of a light rail alignment:

- A. Vehicle Repair uses;
- B. Quick Vehicle Servicing uses; and
- C. A Retail Sales And Service use where a drive-through facility is the primary method of selling or servicing.

Development Regulations

33.450.200 Housing Regulations

- A. **R3, R2, R1, and RH zones.** The siting of new houses, mobile homes, and mobile home parks is prohibited in the R3, R2, R1 and RH zones. However, a house or manufactured home may be constructed on a vacant substandard lot as regulated by the base zone.
- B. **R5 zone.**
 - 1. **Duplexes.** Duplexes are allowed by right on lots of at least 7,000 square feet in the R5 zone, in addition to other allowed situations.
 - 2. **Attached houses.** Attached housing at an R2.5 density is allowed in the R5 zone if it is proposed to be sited on a corner, on a light rail street, or on locations where the side lot line of the development abuts a multi-dwelling, commercial, or industrial zone. When developed at the R2.5 density, attached housing must meet the development requirements of the R2.5 zone.

33.450.205 Minimum Floor Area Ratio

The minimum floor area ratio (FAR) for all new development in the CO, CM, CS, CG, and EG zones is 0.5 to 1. Expansions of existing development are exempt from this FAR minimum. The purpose of the minimum FAR is to create a more intense built-up environment, oriented to pedestrians, within the LRT zone.

33.450.210 Park-And-Ride Facilities

Park-and-ride facilities (classified in the Basic Utilities use category) when allowed by the base zone, must comply with the standards stated below.

- A. In the C and E zones, parking structures on sites that abut a light rail street must have at least 50 percent of the structure's street frontage developed for Retail Sales And Service or Office uses. This standard does not apply to underground parking.
- B. In an R zone, the Office of Transportation requires that park-and-ride facilities must be constructed so that the primary vehicle entrance and exits are not onto a light rail street.

33.450.215 Building Setbacks From Streets

The minimum setback between buildings and a street lot line is 10 feet.

33.450.220 Ground Floor Windows

(Amended by Ord. No. 166702, effective 7/30/93)

The ground floor window standards of 33.130.230.B.2 apply to all development in the RH, C, and E base zones.

33.450.225 Improvements Between Buildings and the Street

The land between a building or exterior improvement and a street must be landscaped to at least the L1 standard and/or hard-surfaced for use by pedestrians. If hard-surfaced, the area must contain pedestrian amenities such as benches, drinking fountains, and/or other design elements (such as public art, planters, and kiosks) and be physically separated from parking areas by a 3 foot deep area landscaped to at least the L2 standard. Houses, duplexes, and attached housing are exempt from this section.

33.450.230 Parking Between Buildings and the Street

Parking areas between the main building(s) and a light rail street are prohibited unless it is a deep lot. On a deep lot, the parking area must be more than 300 feet from the light rail street. Houses, duplexes, and attached houses are exempt from this section. In order to qualify as a deep lot, the lot must have enough depth to accommodate the 300 foot front setback, the rear setback, and the development. An adjustment to the 300 foot distance is prohibited.

33.450.235 Maximum Number of Parking Spaces

The number of parking spaces for nonresidential uses may not exceed 150 percent of the required parking spaces stated in Table 266-2 of Chapter 33.266, Parking and Loading. Park-and-ride facilities are exempt from this requirement.

33.450.240 Exterior Display, Storage, and Activities

Exterior display, storage, and activities are prohibited. Outdoor seating for restaurants and pedestrian-oriented accessory uses, such as flower, food, or drink stands, are exempt from this requirement.

33.450.245 Gates

If a gate is constructed across a vehicle accessway, it must be located at least 18 feet back from the edge of the sidewalk closest to the street lot line. Where no sidewalk is present, the gate must be a minimum of 18 feet from the street lot line.

33.450.250 Office of Transportation Requirements

- A. Drive-through facilities.** The Office of Transportation requires that drive-through facilities, when allowed in the base zone, must be constructed so that the primary vehicle entrance and exits are not onto a light rail street.
- B. Curb cuts.** The Office of Transportation encourages the consolidation of curb cuts and discourages new curb cuts along light rail streets, taking into account safe traffic flow, the objectives of this chapter, and access points needed for the proper functioning of the development.

WEST OF THE WILLAMETTE RIVER

Use Regulations

33.450.300 Prohibited Uses

- A.** The following uses are prohibited on the portion of a site within 500 feet of a light rail alignment:
 - 1. Vehicle Repair Uses; and
 - 2. Sale or lease of consumer vehicles, including passenger vehicles, motorcycles, light and medium trucks, travel trailers, and other recreational vehicles. Offices for sale or lease of vehicles, where the vehicles are displayed or stored elsewhere, are allowed.
- B.** The following uses are prohibited on the portion of a site within 200 feet of a light rail alignment:
 - 1. Commercial parking, surface or structured; and
 - 2. Accessory parking on a surface lot.
 - 3. Replacement parking is allowed as a conditional use as provided in 33.510.235.E.4.

Development Regulations

33.450.400 Prohibited Development

- A. Drive-through facilities.
- B. Exterior display of goods and exterior storage on the portion of a site within 500 feet of a light rail alignment. Outdoor seating for restaurants and pedestrian-oriented accessory uses, such as flower, food, or drink stands, are exempt from this requirement.

33.450.410 Minimum Floor Area Ratio

The minimum floor area ratio (FAR) for all new development is 1 to 1. Expansions of existing development are exempt from this FAR minimum.

33.450.420 Minimum and Maximum Parking Requirements

- A. **Minimum number of parking spaces.** On the portion of a site within 500 feet of a light rail alignment, the minimum number of parking spaces is 50 percent of the required parking spaces stated in Table 266-1 of Chapter 33.266, Parking and Loading.
- B. **Maximum number of parking spaces.** The number of parking spaces for non-residential uses in the LRT zone may not exceed 150 percent of the required parking spaces stated in Table 266-2 of Chapter 33.266, Parking and Loading.

33.450.430 Location of Vehicle Access and Area

Parking access near a light rail alignment. New motor vehicle access to any parking area is prohibited within 75 feet of a light rail alignment. Location of vehicle area is regulated by Chapter 266, Parking and Loading, except as provided in 510.235 B.5.

33.450.440 Improvements Between Buildings and the Street

The land between a building or exterior improvement and a street must be landscaped to at least the L1 standard and/or hard-surfaced for use by pedestrians. If hard-surfaced, the area must contain pedestrian amenities such as benches, drinking fountains, and/or other design elements (such as public art, planters, and kiosks) and be physically separated from parking areas by a 3 foot deep area landscaped to at least the L2 standard.

33.450.450 Ground Floor Windows

The ground floor window standards of 33.130.230.B.2 apply to all development in the RH, C, and E base zones.

A.3 Washington County's Transit Overlay Zone

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381 INTERIM LIGHT RAIL STATION AREA OVERLAY DISTRICT

381-1 Intent and Purpose

The intent of the Interim Light Rail Station Area Overlay District is to direct and encourage development that is transit supportive and pedestrian oriented in areas within approximately a one-half mile radius of planned westside light rail transit station sites pending the development and adoption of site specific station area plans.

The purpose of this District is to limit development during this interim period to that which has a sufficient (1) density of employees, residents or users, (2) number of trips serviceable by transit and (3) pedestrian oriented design so as to be supportive of light rail transit and pedestrian travel and reinforce the substantial public investment in westside light rail transit.

381-2 Applicability

The Interim Light Rail Station Area Overlay District shall apply to lands within approximately one-half mile of light rail station sites, as shown on applicable community plan maps.

In identifying areas subject to this district, consideration was given to parcel size, ownership patterns, the existing transportation network, existing development patterns, development and redevelopment opportunities, the ability of pedestrians to access transit easily, the amount and location of vacant land, and other relevant factors.

The standards of this district shall apply only to development on portions of lots or parcels within the boundaries of the district, and not to development on adjacent lots or parcels under common ownership or portions of lots or parcels located outside the district.

381-3 Designation of Interim Light Rail Station Area Overlay District

The Interim Light Rail Station Area Overlay District shall be applied to community plan maps through the legislative (Type IV) planning process. The Overlay District may be removed through a legislative planning process, but not through quasi-judicial plan map amendment process.

381-4 Definitions

As used in this Section, the words listed below have the following meaning:

381-4.1 Adjacent The location of a building sited on a parcel or lot abutting a street, major pedestrian route, transit station, etc. and not separated by an existing or planned intervening building.

381-4.2 Bulk Retail Use A retail or wholesale to the public use that sells primarily institutional sized or multi-pack products in bulk quantities.

381-4.3 Campus Development A development which meets the following criteria:

(1) is located on a lot or contiguous lots within the Industrial or Institutional districts that total at least five acres in size; and

(2) includes multiple buildings which are interrelated in in a common business or educational activity or process, and share a common infrastructure such as pedestrian ways and spaces, parking and vehicular accessways.

381-4.4 Commercial Parking Facility A parking structure or surface parking lot operated for profit that has parking spaces that are not accessory to a primary use. This term does not include a park and ride lot.

381-4.5 Drive-through facilities Facilities allowing transactions for goods or services without leaving a motor vehicle.

381-4.6 Floor Area Ratio The amount of enclosed gross floor area in relation to the amount of site area, expressed in square feet. For example, a floor area ratio of 1 to 2 means one square foot of floor area for every two square feet of site area (e.g., 20,000 square feet of floor area for a site area of 40,000 square feet). Total gross floor area is measured from the exterior faces of a building or structure and includes pedestrian spaces. Floor area does not include basement areas used for storage or parking.

381-4.7 Frontage Yard The yard between a building and a street

or public right-of-way or easement for public travel.

381-4.8 Interior Yard The yard between a building and a lot line that does not abut a street or public right-of-way or easement for public travel.

381-4.9 Light Rail Station Site The location of land owned or leased or to be owned or leased by Tri-Met upon which is to be sited facilities related to a light rail transit stop (e.g., the station platform, a park and ride lot, entry roads, bus stops, etc.) as determined by the Review Authority after reviewing documents including:

A. the Final Environmental Impact Statement for the Westside Corridor Project, dated August, 1991 or as subsequently adopted by the Tri-Met Board; [or]

B. the Detailed Definition of Alternatives Hillsboro Corridor Alternatives Analysis dated July, 1991, as approved by the Federal Transit Administration or subsequently reflected in the Draft or Final Environmental Impact Statements for the Hillsboro extension of the Westside Corridor Project; and

C. the most recent engineering drawings issued by Tri-Met.

381-4.10 Major Pedestrian Route Any pedestrian way in a public right-of-way or easement that is or is likely to be used by a significant number of people as a means of accessing public transportation service to an area, including access to light rail transit stations.

381-4.11 Park and Ride Lot A parking structure or surface parking lot intended primarily for use by persons riding transit or carpooling and that is owned or operated either by Tri-Met or by another entity with the concurrence of Tri-Met.

381-4.12 Parking Structure A parking garage located above or underground consisting of two or more levels.

381-4.13 Pedestrian Oriented Development Development which is designed with an emphasis on pedestrian access to the site and building, rather than on auto access and parking areas.

381-4.14 Pedestrian Space An area or plaza for use by the public on a controlled basis which may be on public or

private property and which includes at least four of the following features:

- A. At least one sitting space for each 500 square feet. Seating shall be a minimum of 16 inches in height and 30 inches in width. Ledge benches shall have a minimum depth of 30 inches.
- B. Protection from weather such as awnings.
- C. Outdoor lighting at a pedestrian scale.
- D. At least one tree of 2 inches in diameter at 4 feet above grade per 800 square feet, on average, of pedestrian space.
- E. Water feature(s), public art or kiosk(s).
- F. Outdoor eating area(s) and/or food vendor(s).

381-4.15 Pedestrian Way Any paved public or private travel route intended for pedestrian use, whether shared with other transportation modes (e.g., a bicycle/pedestrian path) or intended solely for pedestrian use.

381-4.16 Transit Street Any street that is an existing public transit route, or any street that is likely to be a public transit route. All public streets with a functional classification of Regional Arterial (excluding freeways), Major Arterial, Minor Arterial, or Major Collector, as defined in the Washington County Transportation Plan, shall be considered likely to be a public transit route.

381-4.17 Warehouse A structure that is primarily used for storing or wholesaling goods, wares or merchandise.

381-5 Notification

In addition to the notification requirements of Section 204 of this Code, notice of all Type II and III development applications shall be provided to the Tri-County Metropolitan Transportation District of Oregon (Tri-Met), the Cities of Hillsboro, Beaverton and Portland, and Metro, in the manner provided by Section 204 of this Code.

381-6 Conflicts

Notwithstanding Section 401, in the event of a conflict between the standards of this district and the standards of any other

provision of this Code, the standards of this district shall control.

381-7 Permitted Uses

Except as prohibited by Section 381-8, allowed uses shall be those listed by the underlying district, in accordance with the procedure type specified by the underlying district.

381-8 Prohibited Uses

Notwithstanding contrary provisions of an underlying district, the following uses may not be established as new uses within this interim overlay district, nor may existing uses or the use of existing structures be converted to the following uses within this overlay district:

- 381-8.1 Building Materials Sales and Supplies, excluding hardware stores not exceeding five thousand (5,000) square feet in gross floor area
- 381-8.2 Bulk Retail Uses
- 381-8.3 Car Washes
- 381-8.4 Cemeteries
- 38--8.5 Cold Storage Plant
- 381-8.6 Commercial parking facilities within three hundred (300) feet of a light rail transit station site boundary
- 381-8.7 Commercial surface parking lots within thirteen hundred (1300) feet of a light rail transit station site boundary
- 381-8.8 Detached dwelling units (including manufactured dwellings) except for one dwelling on an existing parcel or lot, or where developed in accordance with the density provisions of Section 381-10.1A as part of a residential development with both attached and detached housing
- 381-8.9 Drive-through facilities within three hundred (300) feet of a light rail station site boundary
- 381-8.10 Drive-through facilities greater than three hundred (300) feet from a light rail station site boundary where the drive-through component of the operation or

service is the primary method of selling or servicing

- 381-8.11 Fuel Dealerships and storage yards (including card locks)
- 381-8.12 Funeral Homes and Mortuaries
- 381-8.13 Furniture Stores
- 381-8.14 Junk Yards
- 381-8.15 Kennels
- 381-8.16 Main Post Offices
- 381-8.17 Manufactured Home Sales
- 381-8.18 Mini-Warehouses
- 381-8.19 Motor Vehicle Service Stations (unless included within a parking structure or underground parking garage) and service facilities (including oil and lubrication services, tire and muffler installation and service, or other motor vehicle services) within thirteen hundred (1300) feet of a light rail transit station site boundary
- 381-8.20 Motor Vehicle Maintenance and Repair Facilities within thirteen hundred (1300) feet of a light rail transit station site boundary
- 381-8.21 Motor Vehicle or Boat Sales, Leasing, Rental or Storage, except motor vehicle rental where the rental vehicles are not stored on site
- 381-8.22 New Parks except for neighborhood parks not exceeding ten (10) acres in size as defined by the Tualatin Hills Park and Recreation District at the time of adoption of this district, unless it is found by a Review Authority, based on evidence and findings submitted by an applicant, that land proposed for a park other than a neighborhood park is unsuitable for the development of transit supportive land uses due to topography or other physical constraints.
- 381-8.23 Recreational Vehicle Parks and Campgrounds
- 381-8.24 Retail Nursery
- 381-8.25 Solid Waste Transfer Stations

- 381-8.26 Travel Trailer rental or sales establishment
- 381-8.27 Truck Stops
- 381-8.28 Warehouses storing materials or products that are not primarily manufactured on site or used in the manufacturing process occurring on site or in the maintenance and operation of manufacturing facilities except for buildings constructed prior to the adoption of this District that were originally designed to be used primarily for warehouse use.

381-9 Change or Expansion of Existing Uses or Structures

- A. Uses identified in Section 381-8 that were lawfully in existence at the time of adoption of Ordinance No. 418 are considered to be approved uses. However, because such uses are not considered to be transit-supportive, future expansions of a lawfully existing use identified in Section 381-8 shall be limited in total to a maximum of twenty percent (20%) of the gross floor area present at the time of the adoption of this District, upon findings that the proposed expansion complies with the development standards in this Code, including this Section, to the extent reasonably practicable. Where the use, design or configuration of an existing development makes it not reasonably practicable to apply a particular development standard or the applicant provides an alternative development proposal which equally or better meets the purpose of the particular development standard, the Review Authority shall waive the application of that standard.
- B. All other uses and structures that were lawfully in existence at the time of adoption of Ordinance 418 may be expanded upon findings that the proposed expansion complies with the development standards in this Section, to the extent reasonably practicable. Where the use, design or configuration of an existing development makes it not reasonably practicable to apply a particular development standard or the applicant provides an alternative development proposal which equally or better meets the purpose of the particular development standard, the Review Authority shall waive the application of that standard. Interior alterations of lawful existing structures shall not be subject to the standards of Sections 381-10 and 11.
- C. The provisions of this subsection do not apply to or authorize any change or expansion of an existing use or structure that is or becomes non-conforming due to

regulation of the underlying district.

381-10 Minimum Density Requirements

381-10.1 Residential

- A. Notwithstanding any contrary density standard in an underlying residential district, including residential districts with a lesser maximum density (i.e., the R-6 and R-9 districts), the density of residential development within this district shall be the greater of:
- (1) seventy-five percent (75%) of the allowed maximum density of an underlying residential district; or
 - (2) twelve (12) dwelling units per acre for that portion of the District located within thirteen hundred (1300) feet of the proposed site of the light rail transit station boundary, and nine (9) dwelling units per acre for that portion of the District located beyond thirteen hundred (1300) feet from the proposed site of the light rail station boundary.
- If more than fifty percent (50%) of property in single or common ownership is located within thirteen hundred (1300) feet of the proposed station boundary all of the property in common ownership shall be developed at a minimum of twelve (12) dwelling units per acre. If less than fifty percent (50%) of such property is located within the thirteen hundred (1300) foot radius, the minimum required density shall be nine (9) dwelling units per acre, provided however that if the area within the thirteen hundred (1300) foot radius is one acre or larger in size, that portion of the property within the thirteen hundred (1300) foot radius shall develop at a minimum of twelve (12) dwelling units per acre.
- B. Section 381-10.1A shall not apply to development of one detached dwelling on an existing parcel or lot as permitted pursuant to Section 381-8.8.
- C. The maximum density specified by Section 381-10.1A may be increased pursuant to the provisions of Section 381-11.1G.

381-10.2 Non-residential

The floor area ratio of non-residential structures developed on lots or parcels in this district shall equal or exceed 1 to 2. For contiguous lots or parcels totalling at least 5 acres in size that are jointly master planned for development in phases, this floor area ratio shall be achieved by the completion of the final phase of development. Pedestrian spaces shall count as floor area for the purpose of meeting the minimum floor area ratio requirement.

381-11 Development Standards

381-11.1 Site and Building Design

A. If a building is adjacent to a transit street or a major pedestrian route at least one major building entry shall be oriented to the adjacent transit street and/or major pedestrian route. Upon provision of light rail service, this entrance shall remain open to the public during normal business hours.

B. Lot Area

The minimum area for new lots or parcels where the primary district is any residential district shall be twenty thousand (20,000) square feet. No partitioning or subdividing to less than 20,000 square feet is permitted except when it is demonstrated that the subdivision or partitioning will occur so as not to preclude complete development of the site at the minimum density specified by Section 381-10.1.

C. Yard Requirements

Except as necessary to comply with Section 418-3, or where the applicant demonstrates and the Review Authority finds that larger yards are needed to mitigate noise and vibration impacts of transit operations, the yard requirements of this district shall be:

(1) In a residential district:

- (a) Minimum ten (10) foot frontage yard setback;
- (b) Maximum fifteen (15) foot frontage yard setback;
- (c) No minimum interior yard except as necessary to comply with the screening and buffering standards of Section 411 and the standards of the Uniform Building Code or the CABO (Conference of American Building Officials) Code, whichever is applicable; and
- (d) Minimum eighteen (18) foot setback yard to garage vehicle entrance.

In residential subdivisions platted at the time of adoption of this district the yard requirements of the underlying district shall apply.

(2) In a nonresidential district:

- (a) Minimum five (5) foot frontage yard setback on a street if there is less than ten (10) feet between the ultimate street curb location and the lot line;
- (b) No required frontage yard if there is at least ten (10) feet between the ultimate street curb location and the lot line, or if the frontage is on a public right-of-way or easement for public travel other than a street;
- (c) In the Office Commercial District and the Community Business District there shall be a maximum ten (10) foot frontage yard setback for at least fifty percent (50%) of the frontage of a building adjacent to a public street or major pedestrian route (pedestrian space shall be considered part of the building);
- (d) No minimum interior yard, except as necessary to comply with the screening

and buffering standards of Section 411
and the standards of the Uniform
Building Code.

- D. (1) Off-street surface parking shall not be
located between an adjacent building and a
major pedestrian route, a transit street or a
light rail transit station site, except as
specified by Section 381-11.1D(2) or (3).
- (2) If a building is adjacent to more than one of
the facilities described in Section
381-11.1D(1), the Review Authority shall
approve off-street surface parking between
the building and one of the facilities and
waive the maximum yard setback provisions of
Sections 381-11.1C(1) and (2). In
determining where off-street surface parking
shall be allowed in this situation, the
following order of pedestrian access priority
shall be given to facilities:
- (a) LRT transit station platforms
 - (b) Major pedestrian routes with direct
access to an LRT station
 - (c) Transit streets
- (3) Off-street surface parking for campus
development within the Industrial and
Institutional districts may be located between
an adjacent building and a major pedestrian
route, a transit street or a light rail
station site upon finding that:
- (a) Identified pedestrian ways are provided
to connect each building within the
campus area and to directly connect the
building complex to the most appropriate
transit street(s) and/or major
pedestrian route(s); and
 - (b) All pedestrian ways between the building
complex and adjacent transit facilities
shall:
 - i. comply with Section 381-11.3C;
 - ii. be clearly identifiable to a
pedestrian through measures such as
signage;
 - iii. be lighted; and

iv. be as short as reasonably practicable.

- E. Exterior building walls facing and adjacent to a major pedestrian route shall contain windows covering at least 50% of the length and 25% of the face area of the ground floor level. Ground level wall areas include all exterior wall areas up to 9 feet above the finished grade. This requirement shall apply only to non-residential development within the Office Commercial and Community Business districts.
- F. The permanent outdoor display and storage of materials and equipment by commercial uses shall be prohibited. Signs, outdoor seating for restaurants and pedestrian-oriented accessory uses, such as flower, food or drink stands, are exempt from this requirement.
- G. Notwithstanding Sections 404-4 and 435, residential densities and nonresidential building height may be increased up to twenty-five (25%), in exchange for pedestrian space, mixed development within the parameters of the underlying district, or parking in a structure or underground.

381.11.2 Landscape Design

- A. Notwithstanding the minimum landscaping requirements of Section 407 of this Code, the minimum landscaping requirements for development in this district shall be ten percent (10%) of the buildable land area for non-residential development and fifteen percent (15%) of the buildable land area for residential development. Exterior pedestrian spaces shall be allowed as a substitute for fifty percent (50%) of the required landscaping in areas adjacent to major pedestrian routes.
- B. Trees shall be planted along uncovered pedestrian ways connecting building entrances to a transit street or major pedestrian route. The trees shall be planted at appropriate intervals to provide continuous shade when trees reach maturity.

381-11.3 Circulation and Access

- A. Pedestrian ways shall be provided to connect building entrances to the nearest transit street(s) or major pedestrian route(s), or both if practicable.
- B. Driveways shall not intersect with pedestrian ways from a transit street or major pedestrian route to a building, unless no practicable alternative exists.
- C. All pedestrian ways that pass through an automobile parking lot shall be separated from the automobile parking area by grade, different paving material, or landscaping. Walkways on private property shall be at least five feet in paved, unobstructed width.

381-11.4 Parking

- A. Off-street parking spaces developed for uses on lots or parcels in this district shall not exceed twenty-five percent (25%) more than the minimum number of spaces specified for a particular use by Section 413 (Parking and Loading).
- B. Through a Type II process, the number of off-street parking spaces provided for a use on a lot or parcel in this district may be reduced up to fifty percent (50%) below the minimum specified for the use by Section 413 when:
 - (1) the use is within thirteen hundred (1300) feet of a light rail station site boundary;
 - (2) there is a safe direct pedestrian link between the use and the light rail station site; and
 - (3) the applicant submits a plan to promote employee, customer or resident transit use which is determined to be adequate by the Review Authority after considering comments from all interested parties including Tri-Met.
- C. Through a Type II process, a development shall be allowed to provide parking spaces in excess of the maximum specified for a use in Section 381-11.4A

when:

- (1) need is demonstrated for parking spaces in excess of the maximum amount;
- (2) it is demonstrated that no reasonable alternatives to excess parking are available such as shared parking, shuttle service, car pooling, subsidized bus passes, etc.; and
- (3) on the development site plan the applicant demonstrates that it would be practicable to redevelop the excess spaces by designating a potential building site on a portion of the parking area containing parking spaces at least equal to the excess number.

D. Applications for development within this district shall address shared parking opportunities pursuant to Section 413-2.7 of the Community Development Code.

381-12

A. Where the light rail right-of-way divides a campus development in single ownership into two portions, where both a light rail station and a park-and-ride lot are to be located within that campus development in Tri-Met's final land use order, and where that campus development has an industrial land use designation and employs more than 3700 people on-site, the standards in Section 381 shall not apply to development proposed within that portion of the campus development containing the larger proportion of the gross square footage, provided that:

1. The portion of the campus development containing the larger proportion of gross square footage retains an industrial land use designation;
2. the proposed development, including new development, expansion of existing development or conversion of existing development to other uses, is permitted under the provisions of the industrial designation;
3. The proposed development does not involve retail commercial or residential uses; and

4. The number of employees working on-site at the campus development is at or above 3700 people at the time of the proposed development, and the proposed development will not result in a reduction in the number of employees working on-site below 3700 people.
8. Proposed development within that portion of the divided campus development containing the lesser proportion of gross square footage shall comply with the applicable standards in Section 381.

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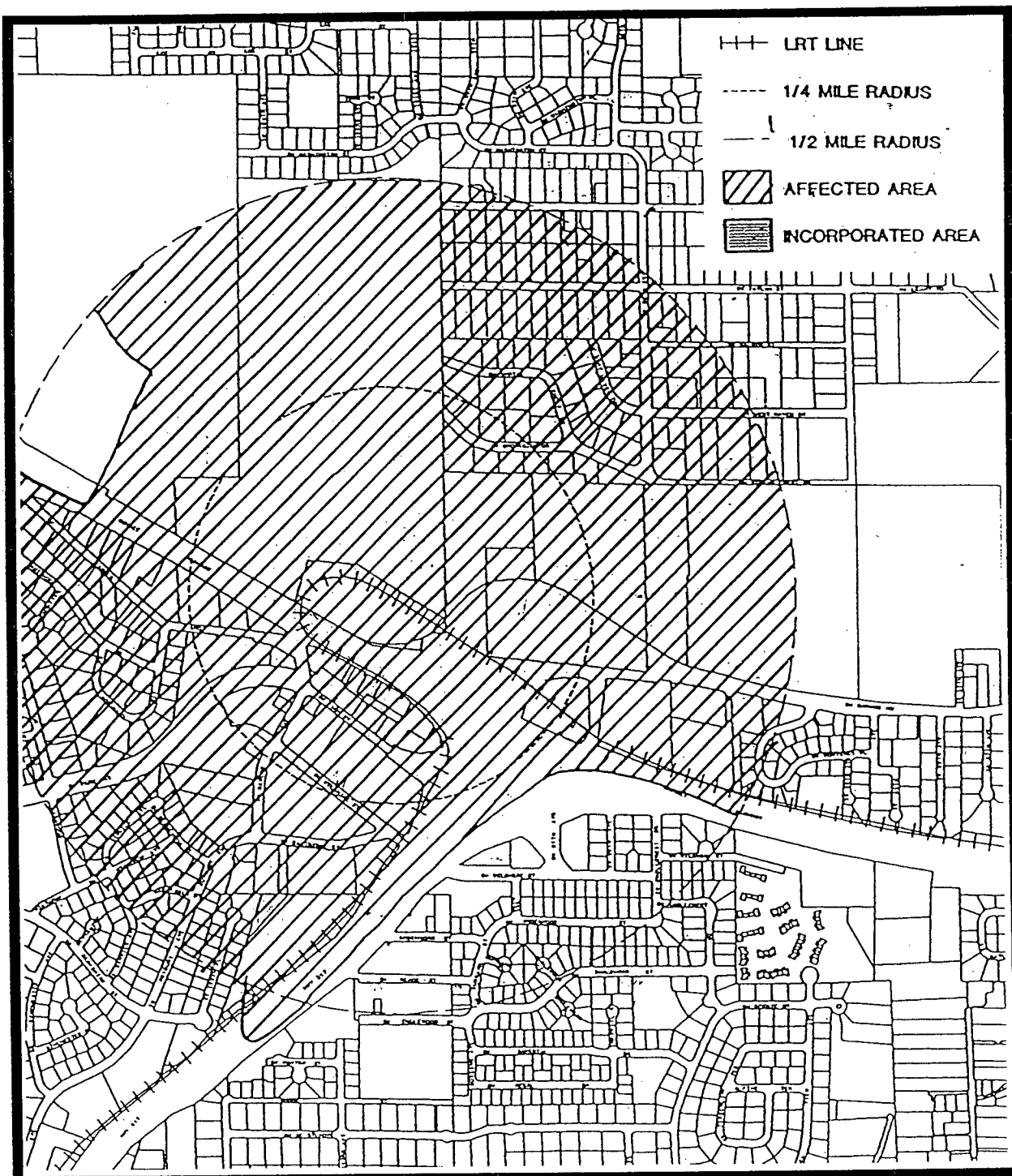


Figure A.1
Sample of Washington County's Transit Overlay Map