

EXECUTIVE SUMMARY

INTRODUCTION

This report focuses on pedestrian-oriented design considerations as they relate to rapid transit station facilities. BC Transit, the provider of transit services across British Columbia (excluding Vancouver), and the Capital Regional District, have jointly initiated the Victoria Regional Rapid Transit Project (VRRTP) with the intent of establishing a high quality rapid transit corridor between Victoria's Downtown and the Westshore. To date, the VRRTP has established a preferred alignment along the Trans-Canada Highway but has not chosen the technology (LRT or BRT) or station locations & design.

The need for better integration between new transit investment and pedestrian requirements is established within BC Transit's 2030 Strategic Plan *Shaping Our Future*. This report supports the action item of leveraging new transit station investment to better integrate pedestrian facilities and to ensure their needs are considered during station design.

By determining what design features make a rapid transit station pedestrian-friendly this report will be able to establish a set of recommended design guidelines for BC Transit to consider when designing station-areas for the VRRTP. This study will therefore seek to establish:

- What station-area design features are critical for establishing a pedestrian-oriented rapid transit facility?
- What recommended guidelines can an analysis of the four case study stations and pedestrian-oriented facility design literature offer BC Transit in designing its own rapid transit facilities in Victoria?

RESEARCH & ANALYSIS METHODS

The data collection component of this report was undertaken using two methods; a literature review, and direct site observations. The literature review was initially used to provide the background context for the work to be conducted. This background context was used to develop a basic level of understanding of rapid transit station design and pedestrian design considerations and how they are linked to other concepts. Understanding these components first assisted in narrowing the scope of pedestrian-oriented design components that should be addressed in the study.

These concepts were then further refined by reviewing applicable municipal, regional, and provincial policy documents that may have direct bearing on the implementation of any recommended design guidelines developed by this report. Furthermore, the review highlighted weaknesses in the existing BC Transit station design guidelines, which were used to help guide the direction of further research. Finally, the literature review was used to enhance strategies in situations where the four case study stations failed to provide a desirable 'best-practice'.

Direct observations were conducted at four case study stations that possess positive pedestrian design characteristics. Station-areas and their surrounding communities were evaluated based on the quality of five features: information, access, safety & security, internal circulation, and amenities. The direct observation method documented the quality of these features and compared them against a set of evaluation criteria (Found in Appendix A).

The station features were rated on a scale of 0 to 4 based on the evaluation criteria and aggregated into a matrix. The matrix is available in the 'Site Observations Results' section of this executive summary or see Chapter 5 - Site Observations Results of the full report for the full discussion of findings.

CONTEXT

Chapter 3 – Context provides demographic & transit system information for Victoria and the four case study stations & communities.

Victoria, BC Profile

- City population (2006): 78,057, density of 3,945 ppl/ km²
 - Area: 19.5 km²
- CRD population (2006): 345,146, density of 474 ppl/ km²
 - Area: 2,341 km²
- Aging population with high median age of 43.1 years old compared to national average of 39.1
- High growth in Westshore communities such as Langford (19%) between 2001 and 2006 illustrates westward expansion of CRD

Victoria Regional Transit System Profile

- Carried 24.8 million passengers in 2009/10, which equates to approximately 70,000 users per day
- Transit has a 6.5% mode share of all daily trips
- Although majority of users report they live in the Urban Core 20% now say they live in Westshore up 7% since 2003
- 55+ age bracket saw 11% growth in ridership since 2003 but only 3% said they used transit daily
- High income users increased by 9% illustrating potential maturity of transit as reliable commuter service

Yamhill Station – Portland, OR

- City population (2009): 583,130, density of 1,655 ppl/km²
 - Area: 375 km²
- Station served by Red & Blue Lines of Tri-Met MAX LRT
- Located in downtown on Yamhill St. between 1st & 2nd Ave.

- Pedestrian only neighbourhood dominated by 3-4 storey mixed use residential-above-commercial units

Orenco Station – Hillsboro, OR

- City population (2010): 90,380, density of 1,256 ppl/km²
 - Area: 55.9 km²
- Bedroom community of Portland and served by MAX Blue Line
- High transit mode share of 22% vs. Region average of 6%
- Designed as Smart Growth community in 1997 centered around station that was completed in 1998

Agate Station – Eugene, OR

- City population (2009): 156,185, density of 1,487 ppl/ km²
 - Area: 105 km²
- Station located on EmX BRT service opened in 2007 and is one of two stops that serves University of Oregon
- Surrounding area mostly vacant in 2007 but recently university has constructed several 3-4 storey buildings

Joyce-Collingwood Station – Vancouver, BC

- City population (2006): 578,041, density of 5,039 ppl/ km²
 - Area: 114 km²
- High mode share of transit at 13% and walking & cycling accounting for an additional 13%
- Station located along Expo Skytrain Line in Collingwood Village
- 240,000 riders a day use this transit corridor
- Community initially low-density residential & light industrial but Concert Properties developed a TOD with 16 buildings and 2,700 units (completed 2007)

SITE OBSERVATION RESULTS

Evaluation Criteria		Yamhill Station	Orenco Station	Agate Station	Joyce-Collingwood Station
Information					
1	Is station wayfinding placed and clearly visible at key decision points in the surrounding community?				
2	Is wayfinding provided at key decision points within the station-area?				
3	Does the station area provide payment and system information at major gathering areas?				
4	Does the platform area offer information regarding arrival times and waiting bay locations?				
Access					
1	Are there efficient pedestrian connections provided between the station-area and the surrounding community?				
2	Are the sidewalks linked to the station-area sufficiently wide to allow for uncongested movement from passers-by?				
3	Are adjacent intersections supportive of pedestrian crossings?				
Safety & Security					
1	Are pedestrian walkway sightlines obscured by buildings or landscaping?				
2	Are the walkways on local streets leading to the station-area sufficiently lit?				
3	Is the perimeter of the station-area and platform sufficiently lit?				
4	Are adjacent cross-walks clearly lit and demarcated for oncoming vehicles to see?				
5	Is the station property defined by defensible yet permeable features?				
6	Are public emergency telephones available throughout the facility?				
7	Are there activities occurring at various times of the day in surrounding land uses?				
8	Are surrounding land uses configured in a manner that supports 'eyes on the street'?				

SITE OBSERVATION RESULTS CONTINUED...

Evaluation Criteria		Yamhill Station	Orenco Station	Agate Station	Joyce-Collingwood Station
Internal Circulation					
1	Are pedestrians traveling from the transit vehicle to the station or surrounding land uses suitably separated from moving transit vehicles?				
2	Are stair facilities sufficiently sized to handle pedestrian traffic?	N/A	N/A	N/A	
3	Are corridors sufficiently sized to handle pedestrian traffic?				
4	Is fare collection rapid and convenient in order to reduce bottlenecks?				
5	Do concession facilities impede the movement of pedestrians?	N/A	N/A	N/A	N/A
6	Is the platform sufficiently sized to accommodate pedestrian volumes?				
Amenities					
1	Pedestrian waiting areas offer protection from adverse weather and vehicle exhaust?				
2	Is adequate and good quality seating provided on the station platform and is it protected from adverse conditions?				
3	Are washrooms available within the station?				
4	Are waste receptacles available throughout the facility?				
5	Are on-site concession stands available?				
6	Does the food vending area provide a desirable & comfortable location that supports sitting and talking?	N/A	N/A	N/A	N/A

RECOMMENDED DESIGN GUIDELINES

Information

When preparing a wayfinding strategy a planner must keep in mind that signage must be legible & readable, be placed in a manner that allows for informed decision-making, and makes use of trip segmentation & cognitive mapping skills so users can recall routing later.

Wayfinding in the surrounding community usually takes the form of Comprehensive Information Displays (CIDS) or directional markers. CIDs should provide users with a clear understanding of their relative location to transit facilities, public services, adjacent roads & neighbourhoods, and give approximate walking distances within 15 minutes of CID. Their mapping should focus on the use of standardized symbology to simplify communication of locations and reduce sign clutter. Their locations should be coordinated with municipal planners but are often placed every other block within downtown locations.

Direction markers supplement CIDs and again should make use of standardized symbology and service branding if applicable. Ensure markers are grouped together to reduce sign clutter and do not allow their placement to interfere with regulation signs. They should be placed at any decision point along a route where it is likely a user requires more guidance to the station, which could include cycling trails and adjacent shopping centres.

Station-area wayfinding should be planned by breaking up the trip segments within a facility and deciding where decision points will occur. Establish a hierarchy of signage what will determine which signs should be most prominently displayed, such as station name, and direction to fare processing or the platform. Secondary signage should consist of standard symbology such as the '?' for information

services, and should be colour branded accordingly depending on whether it is information, warning, or regulatory. All signage should be placed in a position that maintains good sightlines and provides adequate time for message processing and action by the user.

Whether information is displayed statically or in real-time, it should be easy to access and made available to all users including those with impairments. Station information should also allow even first time users to quickly manipulate fare processing machines, and determine their locations within the transit system and also the surrounding community.

Access

Linkages between the station-area and adjacent community should focus on direct corridors with high connectivity. Local street and sidewalk networks that foster strong linkages to their neighbours have been shown to increase transit market capture due to short walking distances and times. Planners should establish primary and secondary pedestrian corridors between the station-area and activity nodes in the surrounding area. This preferably should be done before development intensity occurs around a station as doing this work retrospectively is minimally effective.

Planners should analyze sidewalk links to stations and identify gaps, areas that are poorly maintained, and sections that may require upgrades to handle elevated foot traffic. Sizing of new sections should take into account obstructions that may limit capacity and the insertion of grass buffers between the sidewalk and roadways.

To support safe pedestrian roadway crossings, intersections should be less than 18.5m across or include a refuge median. Maintaining signal cycles of less than 40 seconds at crossings will curb the likelihood of jaywalking. This should be coupled with a maximum speed limit of 55km/h. Placing station entrances facing onto minor arterials can assist in achieving these targets.

Safety & Security

The major goal of any facility should be to maintain sightlines to key activity centers and ensure that supporting components such as lighting and adjacent developments are complementarily located to enhance the sense of user safety. Landscaping should be intelligently selected to ensure that it is not too bushy or too tall thereby creating hiding places or blocking out lighting. A good landscaping plan will choose primarily deciduous shrubs lower than 0.5m and trees taller than 4m to maintain good sightlines.

Lighting facilities should sufficiently cover activity areas and pedestrian corridors in a manner that prevent gapping or shadowing. In areas outside the station, ensure that lighting is angled below the horizontal plane to prevent spillover onto adjacent properties. As well, do not use accent lighting as a sole source of illumination as it has minimal spread and can create significant gapping. Station lighting should fully illuminate the platform, fare processing units, and any information displays. It should not be angled in a manner that may impair the vision of approaching vehicle drivers.

Property defining features should be considered in urban situations where there is close proximity between waiting station patrons and general traffic. Ensure that features such as bollards clearly define the space but do not inhibit pedestrian movement.

Telephones or Customer Emergency Stations should be provided on platforms or concourses and should be defined by distinct lighting and tactile surfaces for the visually impaired. They should provide a direct link to an operator but not 9-1-1 to avoid prank calls.

A supportive urban form around station areas can contribute to natural surveillance, which is the enlistment of tenants or shopkeepers in watching over neighbouring facilities like transit station-areas. Adjacent buildings should be in close enough proximity to the station to hear calls for help as well as having windows or

balconies oriented toward the platform to maintain sightlines. Having a mix of activities occurring at different times of the day ensures natural surveillance is a 24/7 activity and strongly deters negative actions.

Internal Circulation

Stations should seek to maintain a clear separation of vehicle and pedestrian movements whenever possible. This begins with analyzing the trip segments that are anticipated to occur in a new facility and attempting to remove the need for crossings where possible. When transit way crossing must occur, it should be direct and provide pedestrians with a clear understanding of when it is safe to cross. Passive safety measures such as 'STOP HERE' or 'DON'T STOP HERE' pavement markings should be used to visually cue users to safe crossing areas. Fencing can further channelize users to safe crossing locations and also deter patrons from jaywalking. Active safety measures such as track gates should be used only when warranted, usually when a crossing is too hazardous for other measures.

Internal pedestrian facility planning should focus on direct linkages and appropriate sizing for efficient movements. Facilities such as stairways and walkways should assist in environmental communication by visually and intuitively linking stages of a trip segment. The intuitive location of stairways and walkways allows users to build a cognitive map of the station and reduces the need for additional wayfinding. Stairways should be sized so that users can easily travel in opposite directions without causing friction and reducing capacity. Additionally, space should be provided to allow faster patrons to pass slower ones in order to reduce bottlenecks. Similarly, walkways should be sized to allow users to move in a relatively free flow environment without undue crowding. When sizing a walkway, planners should subtract obstructions and a 0.5m buffer from the functional width.

Platform sizing needs to account for walking areas, waiting areas, dead zones, queuing areas, and space consumed by fixtures and their 0.5m buffers.

Ticket Vending Machines (TVMs) should be located to allow space for queuing and ensure that this queuing does not impair other pedestrian movements. Ensure that TVMs are adequately protected by canopy cover. TVM interfaces should be straightforward and provide enough information so that first time users can navigate them quickly.

Amenities

Platform shelters must be designed for their specific climate requirements. Ensure that canopy covers are large enough to protect waiting users as well as seating, TVMs, and other equipment that should not be exposed to the elements. Canopies should maintain sightlines to station activity points but not be placed on such steep angles that rain is allowed to enter. Shelters should use unique architectural styling to add to station branding and allow for easy visibility within the surrounding community.

Seating should be constructed of climate appropriate materials in sufficient quantities to permit those who would like to sit, have the opportunity to do so. Seating should include arm and backrests to permit those with disabilities to more easily use them.

Station washrooms should be considered at larger stations but planners may also consider working with adjacent developers to share facilities. If facilities are shared, they must be tied to the development not a specific tenant and regular maintenance is a must. The facilities should be easily seen from the platform area and well lit with appropriate wayfinding.

Waste receptacles are essential at stations and should provide facilities appropriate to the type of clientele present. If the station

services mainly commuters, focusing on paper recycling receptacles would be essential. Use multi-bins where possible to reduce clutter.

Smaller concessions such as vending machines should be placed out of pedestrian corridors but under canopy cover (if providing perishables). No facilities should be placed directly on the platform. Large cafe concessions should ensure customer queuing and seating (if provided) does not impede pedestrian corridors. Seating if provided should be movable to encourage discussion amongst patrons and to allow for easy maintenance & removal.

TOWARDS IMPLEMENTATION

To implement these strategies greater coordination will need to occur with both provincial and municipal agencies. At the provincial level, BC Transit should continue to work closely with BC MoT on the installation of pedestrian crossing facilities adjacent to stations. More discussion will need to occur on the topics of connectivity and sidewalks within the right-of-way as these are areas where BC MoT has the most restrictive policies.

At the local level, BC Transit needs to work more closely with local planning departments to encourage transit supportive development that occurs in conjunction with new investments rather than after-the-fact. BC Transit should work with local engineers to establish enhanced sidewalk standards and to ensure that new adjacent developments are providing direct pedestrian access to station-areas. Additionally, BC Transit should coordinate lighting and landscaping schemes to ensure that gaps are not left and that clear maintenance agreements are in place.

BC Transit should put greater effort in trying to understand the specific needs and desires of Victoria transit users through surveys. This will provide decision-makers with a clear set of user expectations and assist in budget planning for new facilities.